

An evaluation of information use at Mafikeng Health Facilities.



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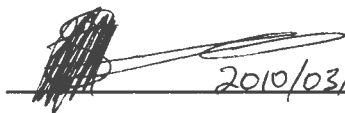
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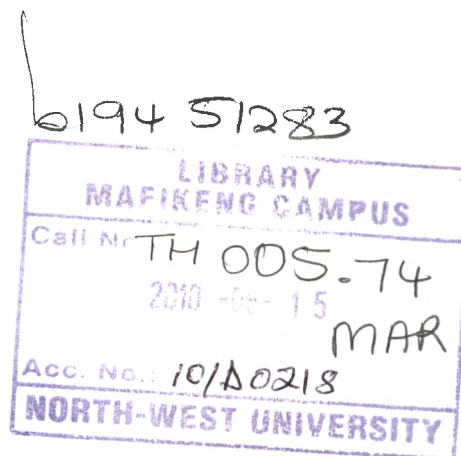
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Declaration

I Thabo Clive Marumo hereby declare that this mini-dissertation for the degree of Masters in Business Administration at the North-West University is my own original work and has not previously been submitted to any other tertiary educational institutions. I further declare that all sources cited and quoted are indicated and acknowledged by means of a comprehensive list of references.


2010/03/05
Thabo Marumo



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Abstract

This study provides an evaluation of information use at Mafikeng sub-district health facilities. The objectives were to determine the level of data management, to check the quality of data from paper based up to electronic based system, also to determine the Primary Health Care data quality at facility level and data/information use.

Seven health facilities at Mafikeng sub-district were randomly selected to participate in the study. The findings of the study indicated that data accuracy was a challenge at most health facilities. The record keeping of registers and records/reports of data (statistics) submitted to the district office monthly were always readily available at all facilities, for evaluation.

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List of abbreviations

CHC – Community Health Center

DHIS – District Health Information Software

DHS – District Health System

DRC – Departmental Research Committee

DQS – Data quality self-assessment

HISP – Health Information System Programme

IT – Information Technology

MIS – Management Information System

NHIS/SA – National Health Information Systems South Africa

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Executive Summary

This study provides an evaluation of information use at Mafikeng health sub-district facilities. The evaluation is divided into three parts. The first part focuses on the management of data and information use by managers at facility levels (clinics). The second part focuses on data accuracy and the last part focuses on action taken by management based on the information gathered and the TALI tool theory.

The National Department of health guidelines (Annexure E) aims at improving the availability of health information at all levels (Facility, District, Provincial and National levels). The guidelines also aim to improve quality of health information and information systems used.

The objectives of the study were to determine the level of data management and quality as presented from paper based registers to electronic database. As well as to determine the level of data analysis presented at health clinic level and how this data is used. The study also looked at feedback processes, data submission levels, the timelines of submissions, and the use of data or information.

Seven facilities from Mafikeng health sub-district were randomly selected to participate in the study. Three questionnaires were used for interviews (Annexure B). All facilities were visited by a team of 4-5 members (field workers). Only managers and/or data collectors were targeted and interviewed.

Out of the seven respondents interviewed, their ages were between 36 and 54 years old and 71% were female. The results showed that only 28.6% of facilities displayed catchments population's figures at facilities and 43% of facilities displayed at least one indicator. This gives a sign that the data were analyzed and were processed to information for usage.

The results also depict that all the selected facilities at the Mafikeng sub-district achieved an outcome of 100% for recording category. This implies that all paper based data collection tools at facilities (that is clinic registers and monthly sheet summary reports) were always readily available, filled in and filed.

The findings for data accuracy analysis showed that data accuracy at facilities was a challenge. The integrity of figures that were reported by paper on a monthly summary sheet report (statistics or data) and the ones that were captured on the District Information System (DHIS) software was at a high level. The accuracy levels of data reported from clinic registers and the one from monthly summary sheet report (statistics or data) depicted that the data integrity was low (the figures were different). This suggests that figures recorded between the two collections tools at the facilities were a challenge, because these figure were supposed to be the same.

The last part of the findings from the TALI tool, suggests that most facilities were not using information for action. According to annexure C, this implies that few facilities displayed at least one indicator or data element graphed. This further implies that the level of information use by managers at most facilities at the Mafikeng sub district was at level 2, according to the TALI TOOL theory, (annexure C).

The study recommends that managers and data collectors be continuously trained on the use and management of health information in order to improve the facility's functioning. They should take action on data gathered. They also need to understand the importance and relevance of data collection and analysis so that care is taken to record correctly.

In conclusion, good management is a precondition for increasing the effectiveness of health services. Also, effective health management relies on the availability of information at every stage of planning, implementation, monitoring and evaluation of health services.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter looks at a brief background of the district health information system in South Africa. Secondly it focuses on the problem statement and lastly the aim and objectives of the study.

1.2 Background

The District Health Information System (DHIS) software is a tool used to monitor and improve data flow at all levels (health local facilities, districts and province). The data collected is used by managers for planning. In South Africa, 53 health districts nationwide capture key health data from 3500 facilities (amongst others these are clinics, mobile services, hospitals), submit and report this information or data to districts, provincial and national levels.

The current status of the North West Provincial Health information data flow is set according to the Notational Information Flow Policy (Annexure E.) The data that is submitted contain vital statistics, child health data/statistics, clinic headcounts and hospital admission statistics, amongst others. Vital statistics are data on natality, mortality, fetal deaths, and induced abortions (Görge, Kirsch-Woik., Schmidt-Ehry, 2004). These are presented in a format of frequencies and rates depending on the data that was recorded.

1.3 Problem Statement

To manage in health services, local and provincial health authorities need updated and precise information on the use of medical resources, medication, and epidemics (Görge, Kirsch-Woik, Schmidt-Ehry, 2004). For medical doctors and health personnel in general, access to updated and complete patient records is vital for optimal patient diagnosis and treatment (Weston, 2001).

In South Africa, the health department aims to improve the availability and quality of health information and information systems (Heywood and Rohde, 2003). However, its data do not always tell a straightforward story and data is sometimes acquired when they are analyzed and interpreted (Heywood A, et al. 2003). According to Görge, Kirsch-Woik, Schmidt-Ehry (2004) data should be synthesized, analyzed and interpreted within the overall context of the health systems functioning and of health intervention delivery.

Görge et al. (2004), also state that beyond the analysis stage there exists the use of the data for decision-making and capacity for data analysis is often lacking at peripheral levels where the data are generated and the results need to be used for planning and management.

According to Heywood et al. (2003), bringing together a comprehensive analysis of the health situation and trends with data on health, inputs such as health expenditure and health system characteristics are particularly important. This analytical work requires planning and investment. Therefore institutionalizing this work as a joint activity of multiple constituencies in the country is important. According to Görge et al. (2004), the following are some of the problems with data:

- Data are collected but not used at all;
- Analysis is poorly done;
- Data quality is not evaluated;
- No reconciliation of data from different sources;

- Statistical methods and models are too complicated to use;
- Non-transparent or inaccurate methods are used; and
- Analysis not focused on ultimate user of the results.

The Annual North West Department of health report of 2004/2005 suggests that the North West Department of Health is experiencing delays in terms of data submission, quality and use. Heyhood et al. (2003) state that in order for health management to be effective, the department rely on data that is timely and of good quality at stages of planning, implementation and evaluation. At times health managers cannot access data that are appropriate, relevant and current. Hence, the use of information by managers to monitor the extent of the departmental objectives to improve coverage and quality of services is sometimes compromised (Görge et al., 2004).

1.4 Main Research questions

The main research questions for this study are:

- Do information officers, data collectors and managers ensure high level of data quality?
- Are the data on the DHIS software the same as those that are in clinic registers, and summary monthly sheet reporting forms?
- Are there actions taken based on the analyzed information?

1.5 Objectives of the study

The study aimed to determine the level of health data analysis and use of health information at health facility level. The objectives are as follows:

- To determine the level of data management and the quality of data from paper based up to electronic based (DHIS) system.
- To determine the Primary Health Care and Hospital data quality at facility level.

- To determine the level of data integrity and information use at facility level.

1.6 Structure of the Study

Chapter 1 briefly discusses the background, history and problem of the study.

Chapter 2 looks at literature review and theoretical framework.

Chapter 3 focuses on the research methodology followed by the study.

Chapter 4 presents the findings and results.

Chapter 5 provides the conclusions and recommendations of the study.

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter focuses on the current Health Information System in South Africa. It also looks at the software in use by the Department of Health which is the District Health Information System/Software (DHIS). Secondly it discusses the processes involved in managing data; and lastly it discusses the theoretical framework that underpins the study. The theoretical framework covers information systems in general and how they operate in an organization.

2.2 Definition of key Concepts

- Facility: North West Department of Health Annual Report 2004/ defines Facility as a building or place where a particular service is provided. This includes clinics, mobile clinics, community health centers (CHC), and/or hospitals.
- District Health Information System/Software (DHIS): Heywood and Rohde (2003) explain the DHIS as a software system for collation, analysis and presentation of health information and, as such, it establishes certain rules for the management of health data. The DHIS Software was first developed in South Africa and has been implemented in all districts and hospitals since 1999. According to Haynes and Visser (2006), the DHIS purpose is to provide support to National, Provincial and Local Government, in the use of data/information to improve management of the health system and health programs (see annexure E).
- Data Elements: Data element is an atomic unit of data that has identification such as a data element name, a clear data element definition, one or more representation terms and optional enumerated values code (metadata).

- Health Indicators: Health Metrics Network (2005) defines indicators or health indicators generally as normal numbers or values that can be measured and that can reflect changes over time. An indicator is further explained using an example annexure F.

2.3 Health Information Systems in South Africa

The health information systems in the South African context will be explored by looking at the current status, of the health department arena concentrating on how data flows in all levels (Facility, District and National levels) and the collection of health data manually versus the usage of DHIS software.

According to Heywood et al. (2003), the scope of a District Health Information System (DHIS) in South Africa is a paper based information system which makes use of forms, procedures and analytical tools. The analysis tool is used to convert routine anonymous data (data with no names) into useful management information which can be used by local programme managers and facility managers at all levels.

According to the National Health Policy (ANNEXURE E), facilities collect data manually daily and then submit aggregated monthly data on paper to the sub-district office for capturing. The office would then electronically export that data and send it to the next level via email and/or in a stiffy disk.

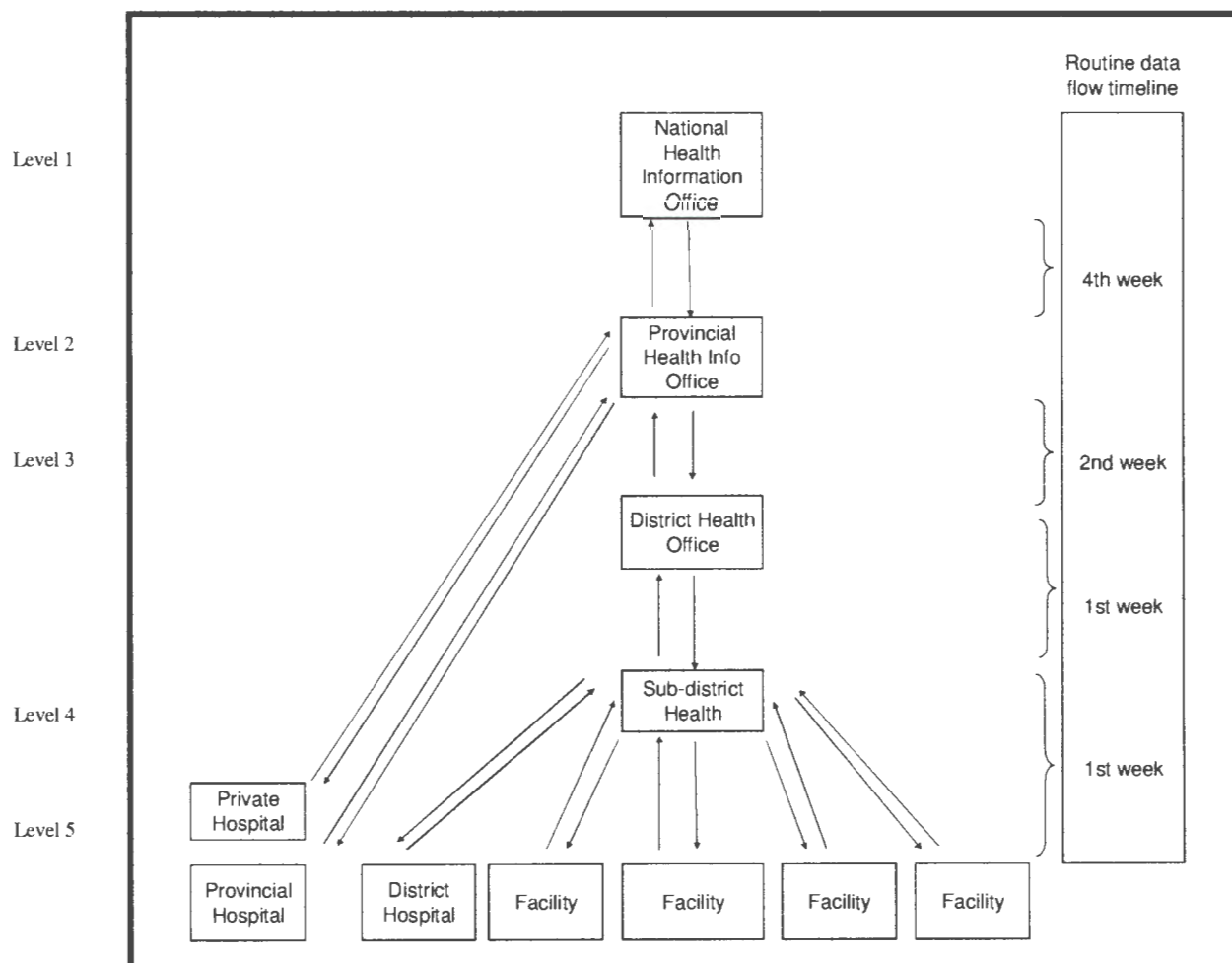


Figure 2.1: Information flow

Figure 2.1 represents the flow of data from Facility up to National level. The two arrows in figure 2.1 reflect feedback processes, data submission levels, reporting lines, and the timelines of submissions. The following are addressed regularly:

- Collection of data according to a defined essential dataset;
- Collation of data at appropriate levels;
- Checks on data quality; and
- Feedback processes.

Generally, the District Health System (DHS) is responsible for providing primary health care, which is organising a minimum package of curative and preventive services in line with the national health policy to respond to the health problems and needs of the local population (Görge, Kirsch-Woik, and Schmidt-Ehry, 2004). Within the DHS, the primary and secondary delivery service levels that have to be supervised, coordinated and supported by a management body can be distinguished. However, the system also comprises village and community-level activities as well as vertical programmes, thus rendering the overall structure significantly more complex.

The primary delivery service level comprises all health centres, dispensaries and similar facilities in the communities with qualified staff such as nurses and midwives, but not doctors (Görge et al., 2004). This primary delivery service includes facilities like Clinics, Satellite Clinics and Mobile services.

The secondary delivery service level refers to all first referral hospitals (for all services at primary level). Generally, there is an official district hospital, sometimes smaller hospitals, and mostly non-governmental hospitals. Unfortunately it is rare to find any organised form of cooperation between the hospitals in a district (Heywood et al., 2003).

According to the North West Department of health annual report of 2005/2006 a referral system is intended to ensure an operational link between the two service delivery levels, which demands advanced logistics (vehicles, communications technology such as radios, telephones or mobile phones and an appropriate reporting system). The enormous cost of maintaining this system is generally prohibitive because resources are scarce, the system can only be justified if effective controls (for example by the community council) ensure that ambulances, for instance, are used for their intended purpose.

The South African National health Information flow Policy (Annexure E) and figure 2.1 describe health data flow as the flow of information which begins at the Health Facility level. A health facility is defined as the administrative level where people's health information is first recorded. Typically, when a health worker administers a client with

any health condition, the health worker immediately records the client information on the client's card and on the daily tick register. That information is then tallied on an appropriate sheet allowing for easy re-counting.

The facility usually reports to a sub-district health office on a regular basis (monthly and/or quarterly). The Facility reports include the number of health data elements. The health data element is a descriptive property or characteristic of an entity, that is, in database terms, an "attribute" or a "field." In Microsoft and other vendor terms, this is a "property". Therefore, the data element is part of a data structure, which is part of a data store. The list of all data element submitted monthly by the Health Facility is provided in Annexure D. This includes amongst others all the health related data elements such as, Primary health care (PHC) head – count, and immunisation data (1st dose).

To prepare the report, the health facility officer or manager obtains and collates the health data elements administered from the tally sheets. The Health Facility should keep a copy of all the reports sent to the sub-district office (Annexure D). The Health Facility should display the cumulative numbers (data elements and indicators) administered in a graph on display to monitor the progress (for example on immunisation; the immunization coverage targets need to be displayed). This will further be explain in the later sections of 2.5 which give information needs to be displayed and how it is being analysed.

At the Sub-district and District office level, administrative personnel receive the reports, log the date they would have received and then capture the data into the District Health Information System/Software (DHIS) electronically (Gorgen et al, 2004). The DHIS is a computer database developed by the Health Information Systems Programme (HISP). A follow up on late reports is then conducted. The administrative personnel (at these level – sub-district and district levels) then aggregate the information from all the health facilities they oversee and send a periodic district report to the Provincial Office. The Province would then send the data to National level using the DHIS.

According to Heywood et al. (2003), the need for accurate health statistics and population estimates for the status population is acute. Consistent and reliable data are essential to monitor health status, to assess health needs, and to plan, fund, and deliver health care programs to the province's people.

2.4 Data management processes

The process involved in managing health data is described by looking at data quality, the validity and relevance of the data and analyzing data to get information. What is quality? According to Hugo and Couper (2007), quality is described as the “degree of goodness or worth”. It is about meeting standards, conforming to requirements, or performing at acceptable levels. Another way to describe quality is that it is “doing the right thing right”.

In terms of health care, quality improvement is a process of developing and improving quality, through making necessary changes to health care systems (clinics, hospitals, programmes) in such a way that a different level of performance is reached and better results are achieved. This then represents usefulness of information in making changes to the health care system.

Hugo et al. (2007) state that, “One way to understand the usefulness of information is to see it in terms of validity, relevance and the work it takes to obtain the information”.

Usefulness =

Validity x Relevance

Work

Figure 2.2: Formula for usefulness of information (Hugo et al., 2007)

The validity of the information refers to how close the information is to the truth. This depends on the reliability and appropriateness of the tools used for data collection and the skills and honesty of the data collector. The more valid the information, the more useful it is.

The formula in figure 2.2 is explained. The relevance of the information depends on how applicable that information is to the specific situation and the specific topic. The more relevant the information, the more useful it is.

Work is how much effort it takes to get the information. The more work it involves to get the information, the less useful it is. Teams and managers must assess the usefulness of the information that they need or want and that they must plan to gather it (Hugo et al., 2007).

According to Hugo et al. (2007), in order to assess service delivery and improvement, many norms and standards are measured in quantitative ways. Other norms and standards are better measured in qualitative ways. Both quantitative and qualitative data can be valid, relevant and useful. These data are included in the Department of Health operational planning cycle, where norms and standards are set provincially and nationally.

Heywood et al. (2003) note that “the planning cycle is a recurring process of measurement, analysis and action designed to improve management”. This process involves assessment, analysis and action. In this planning cycle, information is at the centre of the process and analysis of information provides answers to four fundamental planning questions (Heywood et al., 2003). These are explained in table 2.1.

Table 2.1: Planning cycle process (Heywood et al., 2003).

Where are we now? <i>Situation Analysis</i>	What <i>information</i> do we need about the health status, resources and priority needs in the district? A complete situation analysis will use data from variety of sources.
Where do we want to go? <i>Planning Tools</i>	What are the <i>goals</i> we wish to accomplish? What <i>indicators</i> will we use to measure our progress towards those goals? And what <i>objectives</i> will we set ourselves for the next period of time, say the year ahead, as we strive to reach the ultimate goals?
How will we get there? <i>Action Plans</i>	What is our <i>strategy</i> for action? Who will do what <i>activities</i> , over what <i>time</i> period and what resources, in order to achieve the <i>targets</i> we set?
How do we know when we arrive? <i>Monitoring and Evaluation</i>	What <i>data</i> needs to be gathered to <i>monitor</i> progress and to <i>evaluate</i> our activities designed to reach the targets?

The planning cycle process can be exemplified by table 2.2 which shows the planning program for the North West department of health 2005/6 annual report. The following indicators were reported and all the planning cycle processes is applied. The example is as follows:

Table 2.2 Maternal Care Indicators

Maternal Care Indicators	2001	2002	2003
Antenatal visits per client	4.1	4.1	3.9
Caesarean Section rate	13.9%	14.3%	18.4%
Teenage Pregnancy rate	11%	9%	10%
Termination of Pregnancy (TOP's)	2050	3363	5120
Maternal mortality ratio (DHIS 1998)	135/100 000	150/100 000	208/100 000

The definition of maternal health indicators as indicated in table 2.2 are as follows as stated by the DHIS software:

- **Antenatal care visits:** The total number of antenatal visits over the number of first antenatal visits (equivalent to number of antenatal clients). It is used to monitor the extent to which antenatal services are able to get pregnant women to come to the health clinic at a minimum of at least 3 times during the pregnancy and/or monitoring how many times they actually come.

The health policy target states that every pregnant woman should have at least 3 antenatal visits, preferably one in each trimester. This indicator must be analysed together with the indicator antenatal coverage. Low antenatal coverage should prompt public campaigns, whereas a low number of visits per antenatal client is more likely related to quality of care (women see little reason to come for repeated visits, or they don't understand why). This indicator generally varies from 2-3 in rural up to 5-6 in urban areas.

- **Caesarean section rate:** The number of cesarean section deliveries, expressed as a percentage of all deliveries. Also called the caesarean delivery rate (Hospital

Minimum Data Set, District Health Information System Database) – is defined as
Caesarean deliveries x 100 divided by Total Deliveries.

- **Teenage pregnancy rate:** The percentage of pregnant women below the age of 18 years at delivery.
- **Maternal mortality rate:** Maternal mortality rate is the number of maternal deaths per 1,000 women of reproductive age (15-49).

Table 2.2 is analyzed according to the National Department of Health Annual norms and standards, and the discussions are as follows:

The number of antenatal care visits per client has remained stable at 4.1 over the last two years. This is more than the required national norm of 3 visits per pregnancy.

Caesarean section rate from Table 2.2 is steadily increasing from 13.9% in 2001 to 14.3% in 2002 and 18.4% in 2003. Teenage pregnancy rate has increased by a percentage from 9% in 2002 to 10% in 2003. Termination of Pregnancy cases reported has increased from 3363 in 2002 to 5120 in 2003.

Annexure D gives a list of all indicators and data elements that the department of health (North West Province) is collecting. The department uses these for analysis in order to reach the health targets, objectives and goals. Most of the data is collected at facility level according to the National Information Flow Policy, (annexure E). Managers and data collectors at all levels (facility, Sub-district, District and Provincial) are required to check for the validity of data and do analysis (National Information Policy, annexure C).

From this example, it should be noted that the health information is used for increasing the effectiveness of health services. Effective health management relies on information at every stage of planning, implementation, monitoring and evaluation of health services. The purpose of the health information system is to provide managers and health care

workers with information that is relevant, appropriate, on time and of good quality in order to assist their decision-making (Heywood et al, 2003).

According to Gorgen et al (2004), in order for information gathered at facility to be useful, it should be acted upon, and the most important principle is to act on information. Managers must know how to use information to improve the facility's functioning. The people on the ground level who record the information need to know the importance and relevance of the data so that care is taken to record it correctly. Data need to be fed back to these staff members. Graphs at ward/clinic level displaying the latest data keep staff informed. It is better to start by collecting a small amount of crucial data and use it well, than collecting a large amount of information and not doing anything with it. Staff should be made aware of the importance of starting small, but making sure that the quality of data is good.

According to Wuest (2000), information management is all about measuring. There are two golden rules when measuring. Firstly, one cannot measure what you cannot define. Secondly, one cannot improve what one cannot measure or you cannot improve if you are not measuring (Wuest, 2000). Measuring generates data, thus the keeping of data is important.

According to Heyhood et al. (2003), health information may be broadly grouped into the following categories:

- Health status information;
This reflects the health needs of the population (that is, the patterns of disease),
It involves Epidemiological surveillance data (mortality and morbidity).
- Health service information;
It reflects the coverage, quality and efficiency of health services.
It involves general health service data (for example, immunization coverage, bed occupancy rate, etc.) and also administrative data (for example, finance system, personnel management system).
- Population information;

This provides the figures for surveillance and service coverage.

It involves vital registration data (for example, birth, deaths, census data, and population movement).

The rationale for using the district health information systems as a vehicle for health service delivery is viewed as the most effective and efficient way of addressing the challenge of designing a comprehensive programme to redress economic and social injustices and to ensure that emphasis is placed on health and not just on medical care (Gaumer, 1998). The health system, based on this approach, is as concerned with keeping people healthy as it is with caring for them when they become unwell. These concepts of caring and wellness are promoted most efficiently and effectively by creating small management units of the framework for the district based health system so that a district health authority can take responsibility for the health of the population in its area (Department of health data flow policy).

Health information management is responsible for the development and administration of health care data collection and reporting systems that ensure the quality, integrity, availability, and preservation of data in support of patient safety, privacy, confidentiality and security (Heyhood et al., 2003).

2.5 Theoretical Frameworks used in this study

Two theoretical frameworks which were explored for this study are the Data Quality Assessment (DQS) tool specifically designed for immunization programme, and the TALI tool. Both tools are meant to bring together a comprehensive analysis of the health situation and trends with data on health inputs, such as health expenditure and health system characteristics. Such analytical work requires planning and investment and institutionalizing this work as a joint activity of multiple constituencies (Görge et al., 2004). According to Heyhood et al. (2003), this is what provides the link between data generation and data use.

Data quality self-assessment (DQS)

Target audience for the DQS utilization is to be used primarily by staff who will adapt the toolbox for a specific area (usually staff at national and provincial levels). The adapted tool should then be used by staff by collecting and using immunization data at the national, provincial or district levels (Health Metrics Network, 2005).

According to Health Metrics Network (2005), the DQS aims to assist countries in diagnosing problems and providing orientation to improve district monitoring. The DQS aims to determine:

- the accuracy of reported numbers of immunizations; and
- the quality of the immunization monitoring system.

The assessment includes a review of data accuracy at different levels and a self-designed questionnaire reviewing monitoring quality issues (for example availability of vaccination cards, use of tally sheets, directly-observed recording and reporting practices). These are then analyzed where strengths and weaknesses are identified, conclusions are reached and practical recommendations are made. These recommendations aim to improve the use of accurate, timely and complete data for action at all levels.

How is a DQS performed? One approach is to hold an initial national participatory DQS workshop involving key people from the national and district levels to review country monitoring practices and to design a self-assessment. This workshop is immediately followed by a practical assessment in a number of districts and health units to provide a self-diagnosis of the monitoring system of the country. However, other approaches can be developed and self-assessments can be designed and conducted without this preliminary workshop.

The final goal of the DQS is to integrate into routine practice the tool options that are most relevant for a country so that constant attention is given to improve monitoring practices and management of immunization activities.

How to use this document? A number of options for evaluating monitoring processes are presented in this document. They should be explored, selected and refined according to specific needs. The DQS does not aim to be standardized across countries. The same flexibility is required when selecting where to conduct the DQS in a country.

According to the World Health Organization (2005), the use of a data quality self-assessment (DQS) toolbox is to assess the monitoring system of immunization at district and at facility levels. This tool is designed for health staff at the national, provincial or district levels to evaluate different aspects of the immunization monitoring system. This tool is designed to determine the accuracy of reported numbers of immunizations and the quality of the immunization monitoring system.

Table 2.3: Description of the main areas of the DQS can assess

Option	District	Facility	Main measures
Assess reporting accuracy	X	X	Accuracy ratio
Assess recording accuracy (sample in the community)		X	Completeness of district reporting (%) Timeliness of district reporting (%)

From table 2.3, the main area of interest in this study, is the assessment of recording accuracy (sample in the community). The principle is to verify the reported information on coverage data, that is, to compare the data available from one level (a form, report, chart, etc.) against the same information that has been collated or reported at a more central level. This frame work will be used to evaluate information use at selected facilities using its collection tool as it appears in Annexure B

The TALI tool

The TALI Tool used by Health Information System Programme (HISP) in South Africa (Annexure C) was selected for use in this study. It is intended to assess health information use in a country in order to conduct the assessment. It identifies three levels of information "use".

Level 1. The HIS is working: timely and accurate data, good coverage, essential data sets

Level 2: Information is analyzed; use of indicators

Level 3: Indicators (i.e. information) used to inform action plans

Summary of Management Information Systems in an organization

Most organisations have one or more information systems (manual and/or computer-based) and transaction processing systems (internationally or externally orientated). Hagg, Commings, and Dawkins (2000) define management information system (MIS) as follows: "Management Information System (MIS) deals with the planning for, development, management, and use of information technology tools to help people perform all tasks, related to information processing and management." According to Martin et al. (2005), MIS is used in organisations to refer to the organisational department or unit that has the primary responsibility for managing Information technology (IT).

According to Duffy and Assad (1989), the traditional view of a manager is someone who plans, organises, develops, co-ordinates and control by making decisions based on information from a formal, preferably, computer-based information system.

The Information Technology (IT) innovations in hardware, software, and networks is described by Martin et al. (2005) as to have escalated the level of IT investments to support today's knowledge by workers, as they have become increasingly dependent on IT to do their jobs. A computer on every desktop has become standard equipment in most organisations, and many workers have access to the internet (Martins et al., 2005).

According to Arthur Heywood et al. (2003), the scope of a District Health Information System (DHIS) is a paper based information system which makes use of forms, procedures and analytical tools. The analysis tool is used to convert routine anonymous data (data with no names) into useful management information. This can be used by local program managers and facility managers.

Health Metrics Network (2005) describes the Data Quality Self-assessment (DQS) as a flexible toolbox of methods to evaluate different aspects of the immunization monitoring system at district and health unit/facility levels. Immunization “monitoring” refers to the regular ongoing measurement of the level of achievement in vaccination coverage and other immunization system indicators (e.g. safety, vaccine management) (World Health Organization, 2005). Monitoring is closely linked with reporting because it involves data collection and processing.

2.6 Literature Review Summary

This chapter explored some theoretical frameworks that are involved in health data management. All health indicators involved, and data management and analysis are presented in annexure D (part 2: Health indicators). The software in use by the Department of Health is the District Health Information System/Software, designed by HISP, and its operation. The next chapter focuses on the Research Methodology of the study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The chapter concentrates on detailing the research methodology employed by the study. The discussion describes the sampling technique used by the study, data collection methods, data analysis and the ethical considerations followed.

3.2 Research methodology

Methodology is a general approach to conducting research. It involves aspects of conducting a research project, developing appropriate methods of data collection and the aspect of comparing and contrasting different techniques and methods. Some methods will be discussed in this section. According to Page (2000), there are two types of research approach, these are the experimental and non-experimental. Marshall and Rossman (1995) define experimental research as a carefully planned process designed to manipulate and influence systematically, while holding other influences constant, in order to observe and measure the outcomes in relation to theory. The non-experimental research, in contrast, encompasses all other types of research methods, and does not measure effects directly by manipulating controlled variables.

The research strategies can also be pure or applied (Page, 2000). According to Babbie and Earl (2004), in applied research, the researcher attempts to solve a known problem and find answers to specific questions. On the other hand, pure or basic research does not necessarily try to answer specific questions or solve specific problems (Cooper and Pamela, 2003). According Page (2000), pure or basic research is done in order to expand knowledge and probe into the unknown

Whether research is pure or applied, the purpose of the study can be descriptive, exploratory, comparative, or test specific hypotheses generated by theory (Davis, 2005).

In this study, a non experimental research approach has been chosen and a descriptive study has been applied. According to Page et al (2000), a descriptive study is a study that sets out to describe a phenomenon or event as it exists, without the manipulation or control of any elements involved in the phenomenon or event under study. As such it is non-experimental form of research.

According to De Vos and Strydom (1998), a descriptive study presents a detailed, accurate picture of a situation, social setting, or relationship. Questions asked in this type of study include “how” and “who” and a survey research type is a good example of this descriptive approach.

Page et al. (2000) further describe the term descriptive research as the one that refers to a type of research question, design, and data analysis that will be applied to a given topic. Descriptive statistics tell what is, while inferential statistics try to determine cause and effect (Sculze, 2003).

According to Davis (2005), descriptive research does not fit neatly into the definition of either quantitative or qualitative research methodologies, but instead one can use elements of both, often within the same study. In terms of McMillan and Schumacher (1993), a qualitative research method is being used to explore and understand people's beliefs, experiences, attitudes, behaviour and interactions, while Health Research Policy in South Africa (2001) defines quantitative research method as the one that generates numerical data or data that can be converted into numbers, for example clinical trials or the National Census, which counts people and households.

Schulze (2003) suggests that it is important for researchers to realize that qualitative and quantitative methods can be used in conjunction with each other. He states that “by

combining quantitative and qualitative research methods, researchers can simultaneously conform to and transcend dominant research conventions, by making use of the most valuable features of each” (Schulze; 2003).

In summary, for this study, descriptive research is chosen, and both qualitative and quantitative approaches (methods) have been employed.

3.3 Population and Sampling

According to Page et al (2000), the circumstances under which the findings may be generalized include defining the population of people or organizations to whom the findings are to be generalized. A population may consist of one particular organization only, or a group of organizations. Inclusion of the whole population in a study is known as a census, which in most cases is too large for individual exploration and only a small portion of the population or sample can be studied.

In this study, the target population was facilities where data collectors and/or facility manager reports monthly to the Mafikeng sub district office, by making use of the standardized monthly reporting formats. These are personnel at a facility level (clinic or community health center).

A sample is a finite part of a statistical population whose properties are studied to gain information about the whole (Webster, 1985). When dealing with people, it can be defined as a set of respondents (people) selected from a larger population for the purpose of a survey. Sampling is the act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population.

There are a number of sampling techniques researchers can employ. This study employed probability sampling. According to Richards and LaCava (1983), probability sampling is a technique used to ensure that every element in a sample frame has an equal chance of

being incorporated into the sample. According to Richards et al (1983), there are four types of sampling techniques falling under probability sampling. These are, simple random, systematic random, stratified random and cluster random sampling.

The sampling technique chosen for this study was stratified random sampling. According to Webster (1985), stratified random sampling is used when dealing with a sample frame that is not homogeneous and contains subgroups. In order to achieve this, random selection from each subgroup (or stratum) in the sampling frame has to be considered. The subgroups within the sample frame will have to be treated as though they are separate sampling frames themselves. Freund and Williams (1977) define this type of sampling also a stratified sampling.

The advantages of selecting a stratified sampling as Freund et al (1977) state is that stratification will always achieve greater precision provided that the strata have been chosen so that members of the same stratum are as similar as possible in respect of characteristic of interest. It also ensures better coverage of the population than simple random sampling. The disadvantages of selecting a stratified sampling, according to Page et al (2000), is the difficulty in identifying appropriate strata, as it may be complex to organize and analyse results. This study dealt with a sample frame that is not homogeneous and which contains subgroups or strata such as clinics, community health centers and hospitals. That is why a stratified sampling was applied.

Table 3.1 shows facilities which were randomly selected using a stratified random sampling technique from the total population of the Mafikeng sub-district facility list (Annexure A). This facility list is defined differently, hence a selection of clinics formed one stratum while the Community Health Centers (CHC) formed the other stratum (note: Mobile and District Hospitals strata were excluded for selection).

Table 3.1: Selected Facilities

Clinic	Lokaleng	No
Clinic	Tsetse	No
Clinic	Lekoko	No
Clinic	Lonely Park	No
Clinic	Rapulana	No
Community Health Centre	Montshioa CHC	Yes
Community Health Centre	Lekoko CHC	Yes

Table 3.1 depicts that five clinics and two CHC have been selected and the strata selected were based on the organizational type. Only 23% of the facilities in the clinic stratum were randomly selected, while a 50% from the CHC stratum were selected; see (annexure A). Managers and/or information officers (data collectors) of these facilities were automatically selected as the respondents.

3.4 Data Collection Methods and Procedures

Data collection is the manner in which a researcher brings “order, structure and meaning to the mass of collected data” (Marshall and Rossman, 1995). Creswell (1994) further explains that data collection as a collection of a series of interrelated activities aimed at gathering rich information to answer the research question.

According to Page et al. (2000), data can be primary or secondary, and whether one or both are used, and which is used, depends largely on the research question and the availability of these data sources. According to Hoover et al. (2004), secondary data refer to data gathered by others or from other studies and is generally less costly and less time consuming than gathering primary data. Typically, it is accumulated before primary data is gathered, and may even help determine the course by which primary data is pursued

Primary data is that which is collected by the researcher to address the current research question (Babbie, 2004)). Types of primary data include subject demographics, lifestyle characteristics, attitudes, knowledge, intentions, motivations, and behavior (Babbie, 2004). According to Page et al. (2000), demographic data includes statistics regarding populations, such as age, sex, income, level of education, and so forth.

In this study both primary data and secondary data were employed and three types of data collection tools (questionnaires) were used. These are, a questionnaire developed by the researcher, data accuracy tool and data quality self-assessment tool (annexure B).

The first data collection tool collected primary data. The questionnaire was formulated and piloted. The data collection tool was in the form of both qualitative and quantitative forms.

The second data collection tool was extracted from the data accuracy analysis which was developed by the World Health Organisation WHO (2005), as a measure of evaluating data accuracy, focusing on a child health care programme and immunization data elements. This tool applied quantitative method representation, and the tool is called data accuracy tool (questionnaire 2, annexure B). Both primary and secondary data were applied. Data from the DHIS were collected before the visit and the figures were verified on the other two different data resources (clinic register and monthly reporting format/sheet). That is, the figures previously reported manually were compared with the ones captured on the system/database. The study concentrated on the period of April 2005 to August 2005.

The third data collection tool was also extracted from the data quality self-assessment (DQS) which was developed by WHO (2005), as a measure of quality and evidence of information use at facility, focusing on child health care programme. The form of data was quantitative and the form of data collection was a primary type.

According to the World Health Organization (2005), the use of a data quality self-assessment (DQS) toolbox is to assess the monitoring system of immunization at district and at facility levels. This tool is designed for health staff at the national, provincial or district levels to evaluate different aspects of the immunization monitoring system. This tool is designed to determine the accuracy of reported numbers of immunizations and quality of the immunization monitoring system

Page et al. (2000) also state that there are two types of procedures for generating data. These are interactive and non-interactive procedure. They further explain non-interactive data collection procedures as data collected without personal interaction. These types of data collections are surveys, re-collecting existing data and hidden observation. McMillan and Schumacher (1993) explain interactive procedures for data collection as those that require an interaction between the participant and another individual in order for data to be collected. These types of interactive methods are interviews, observation and focus groups.

All the types of interactive data collection procedures were applied for this study. These types introduce the human, social communication element to the research (Page et al., 2000). Team/group of 4-5 interviewers was formed to conduct visits to facilities, both interview and observation types of data collection were conducted.

The data gathered from these three questionnaires were captured on an EPI-info database and excel spreadsheet. These excel and EPI info databases are used for health research statistical purposes. The validity of data was checked before data analysis processes unfolded.

3.5 Data Validation

It is important in research to ensure the validity of the gathered data. According to Page et al. (2000), validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. While reliability is concerned with the accuracy of the actual measuring instrument or procedure, validity is concerned with the study's success at measuring what the researchers set out to measure. Researchers should be concerned with both external and internal validity. External validity refers to the extent to which the results of a study are generalizable or transferable.

In this study, the group that conducted the interviews at the selected facilities recorded/filled the forms themselves. To ensure validity, these interviewers were firstly trained to fill in the form during mock interviews conducted before the actual ones. They were always accompanied by the researcher. This was done to save time as there were three questionnaires to be filled. The evidence of displaying of indicator charts/or statistics, and catchments population at a facility were observed onsite. The counting of statistics from the clinic registers, monthly reporting format were conducted by both the respondent and the group/team of interviewers. These procedures were included to minimize errors, and to conduct validations on site.

Data captured on EPI info and excel spread sheets, were validated by making use of two stages in the capturing process. A capturer captured the data, and in the second stage a different person did verification of the data captured. This was done to ensure reliability and to avoid errors in data capturing.

3.6 Method of Data Analysis

The data were analysed using the approach of Babin and Rubin (1995). Babin and Rubin (1995), states that data analysis begins while the interview is still underway. This preliminary analysis tells you how to redesign your questions to focus on central themes as one continue interviewing.

Moreover, the nature of the problem will, to a large extent, dictate the type of data analysis technique one chooses. Patton (1987) argues that data analysis is more than a mere translation of data. He says that it entails the interpretation thereof. According to Patton (1987), 'interpretation' is the attaching of meaning and significance to the analysis, explaining descriptive patterns, and looking for relationships and linkages among themes and categories. According to Page et al (2000) data analysis in practical social research, words and pictures which are generated as data that need to be systematically and objectively categorized, analysed for meaning, and interpreted for the impact upon the issues.

The analysis for this study was based on the three objectives of the study (chapter 1 section 1.5). A ranking technique was used and was based on the questions asked and statistical applications were used for analysis. The results were presented in a form of frequency tables which included the median, mode, and graphs. The relationships between variables were also explored. The tool according to annexure C and the software developers (Health Information Systems Programme - HISP) was also applied as a technique to assist in the analysis of the software in terms of use and action taken (annexure C).

3.7 Ethical Considerations

Clinics were informed of the project through the Provincial Data Administration Manager, and the Central District and the Sub-district Manager of Mafikeng. An information letter explaining the process and detailing approval was sent to each of the clinics sampled. Personal arrangements were made by the researcher with the clinics prior to visiting them. The informed consent of all people interviewed was obtained. No names or identifying details of patients or staff are used in reporting the results.

CHAPTER 4

RESULTS AND ANALYSIS

4.1 Introduction

The study results are analyzed in four parts. The first part focuses on the demographics of the respondents; while the second part's focus is on the management of data and information use by managers at facility levels (clinic or Community health centers (CHC)). This part is described as Data Quality Self-Assessment tool analysis. The Third part focuses on the facility data accuracy and the last part focuses on actions taken by the management teams at Health Facility levels, making use of the TALI tool methodology, as discussed in the previous chapter.

4.2 Demographics

Of the seven facilities managers/data collectors (respondents) interviewed, 71% were female. The response rate for the selected facilities was at a 100%. All selected facilities (table 4.1) were visited and interviews took place with the manager and/or data collector (annexure B).

Table 4.1: Facilities visited

Facility	Type	gender	DHIS software	Total
Danville Clinic	Clinic	Male	No	1
Lekoko CHC	Community Health Centre	Female	Yes	1
Lokaleng Clinic	Clinic	Female	No	1
Lonely Park	Clinic	Female	No	1
Montshioa CHC	Community Health Centre	Female	Yes	1
Rapulana Clinic	Clinic	Male	No	1
Tsetse Clinic	Clinic	Female	No	1
Grand Total				7

Table 4.2: Gender

	Frequency	Percentage
Female	5	71%
Male	2	29%

From the facility managers and/or data collectors interviewed, 71% were female. Out of the seven facilities visited only 2 males were interviewed. The respondents were aged between the 36 and 54 years old.

4.3 Results: Data Quality Self-Assessment tool analysis

All facilities listed in table 4.1 were visited and either the head of the facility or the data collectors were interviewed by the field teams and where possible the team would require evidence or proof to be shown. The areas of questions were divided into 5 categories. These are the following: recording, archiving and reporting, demographics, core outputs/analysis and evidence of using data. These are further explained / defined as follows:

Recording: Availability of registers, monthly sheet reports; also look at the availability of a place where files or forms are kept and are they organized by date.

Archiving and reporting: Looking at place where forms, registers are kept. Are these easily retrievable and available.

Demographics: Does the Health Facility know its catchments populations, and are these displaced per age group.

Core outputs/analysis: Feed back reporting with Communities, Brochures availability, Clinic committees availability, Minutes available

Evidence of using data: Asses information usage in the Health Facility.

All the findings from the facilities were represented in a grader chart. According to the World Health Organization (2005), a grader Chart is a Process Management Tool used to define and rank important performance measures; define the ideal level of performance for each measure; and visually present the achieved level of performance, due to an intervention, for each measure capture the differences of perception of team members about each performance measure.

4.3.1 Tsetse Clinic

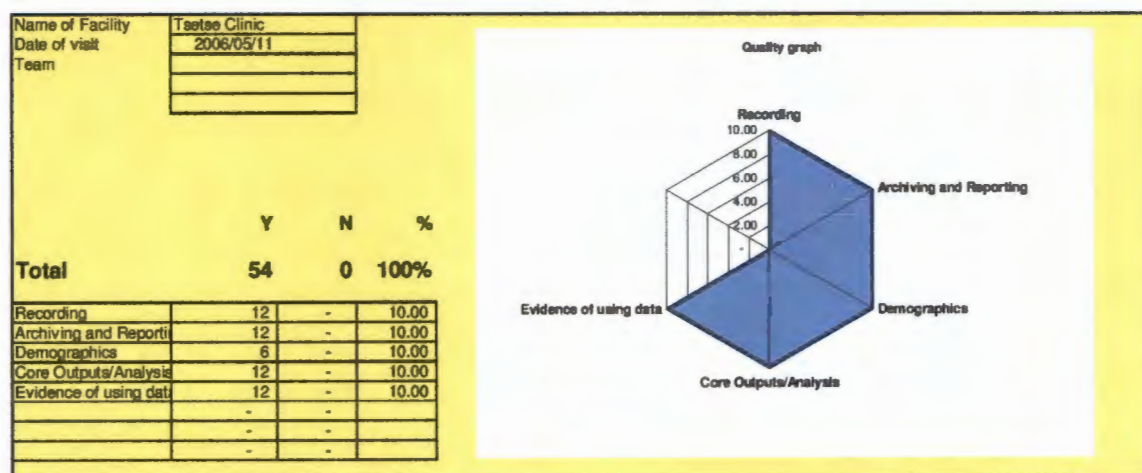


figure 4.1: grader plot- quality graph
(Note 10 = 100%, 8=80%, 6=60%, 4=40% and 2=20%,)

Figure 4.1 depicts that Tsetse clinic has complied with all areas that were selected. A score for all categories were at a 10 ranking scale (100% achieved) for all categories. The facility management style is in line with the Information Management flow policy (Annexure: C), that is using information for decision making.

4.3.2 Lokaleng Clinic

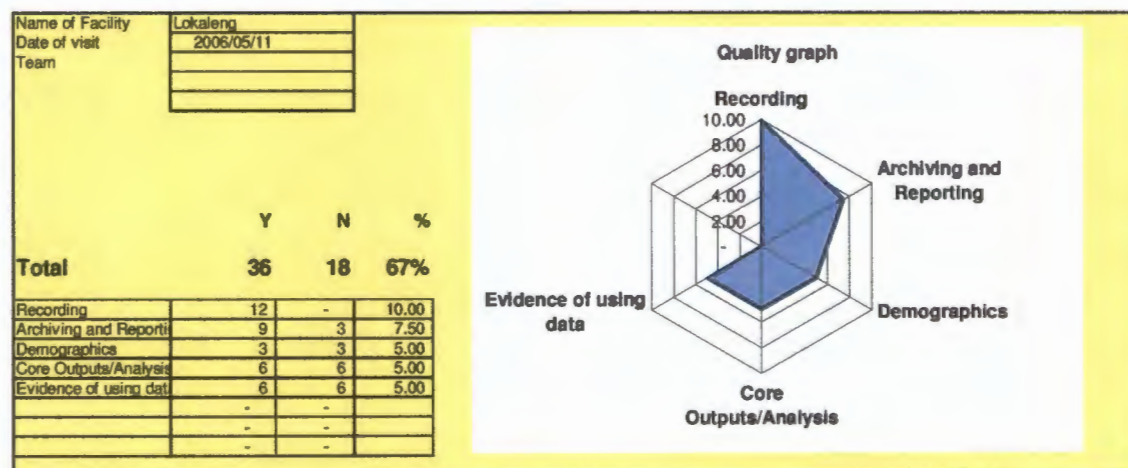


figure 4.2: grader plot- quality graph
(Note 10 = 100%, 8=80%, 6=60%, 4=40% and 2=20%,)

Figure 4.2 depicts that Lokaleng clinic has complied only with the recording categories in terms of the highest ranking of 10 (100% achieved). A ranking of above 5 is presented for the remaining categories.

4.3.3 Montshioa Community Health Care (CHC)

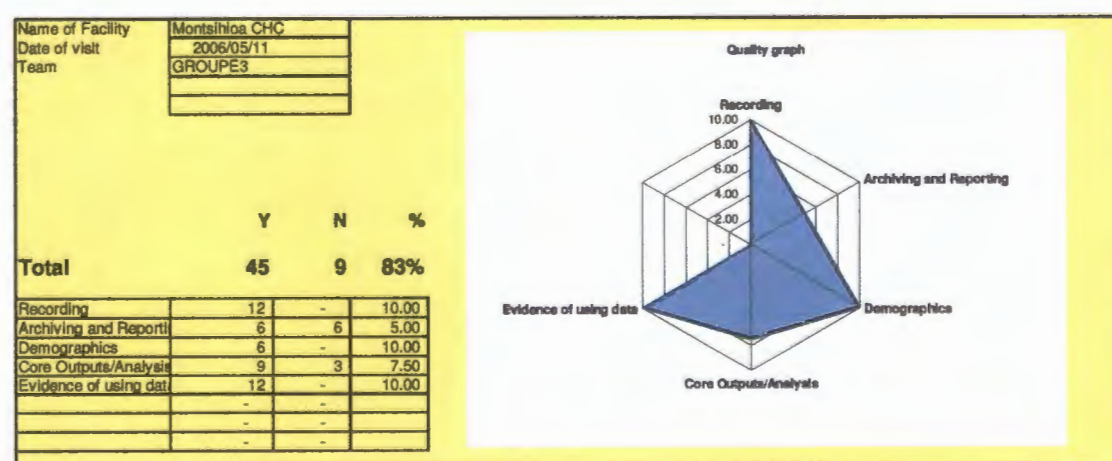


figure 4.3: grader plot- quality graph
(Note 10 = 100%, 8=80%, 6=60%, 4=40% and 2=20%,)

Figure 4.3 depicts that Montshioa CHC has complied on a 100% ranking scale for only three categories. That is, the recording part, archiving and reporting part and last is the evidence of using data. The Montshioa CHC has scored a ranking of between 40% and 80% for the core outputs/analysis categories. However they need to work had so that they improve the archiving and reporting area as they have scored a ranking score of less than 40%.

4.3.4 Rapulana Clinic

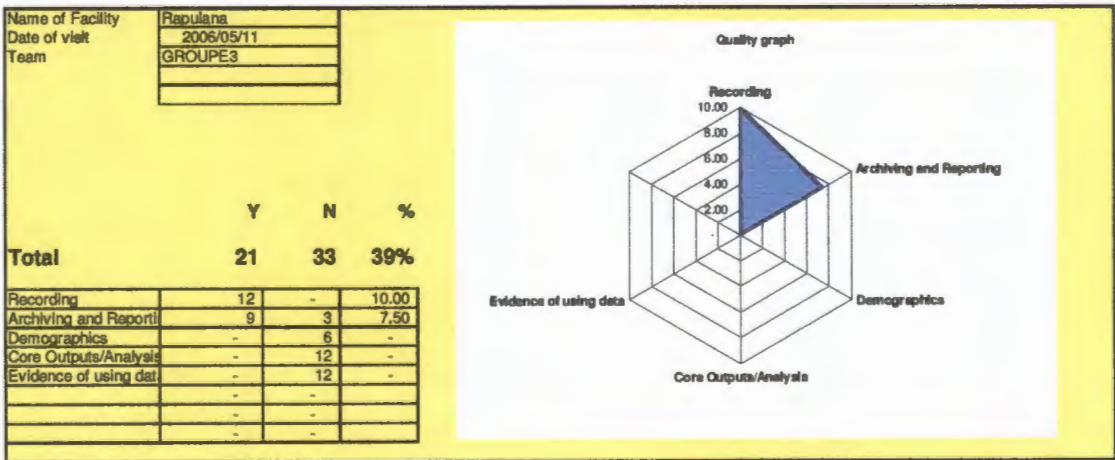


figure 4.4: grader plot- quality graph
(Note 10 = 100%, 8=80%, 6=60%, 4=40% and 2=20%,)

Figure 4.4 depicts that Rapulana clinic has complied only to the recording categories and a has a fairly good archiving and reporting system. Both have a score of 10 and 5 ranking respectively. In terms of the remaining three, that is, demographics, core outputs/analysis and evidence of using data categories, these still remain a challenge for the facility. For all these, the facility has a score of 0% ranking. A ranking of above 5 (50%) is presented for the remaining category of archiving and reporting.

4.3.5 Lekoko clinic

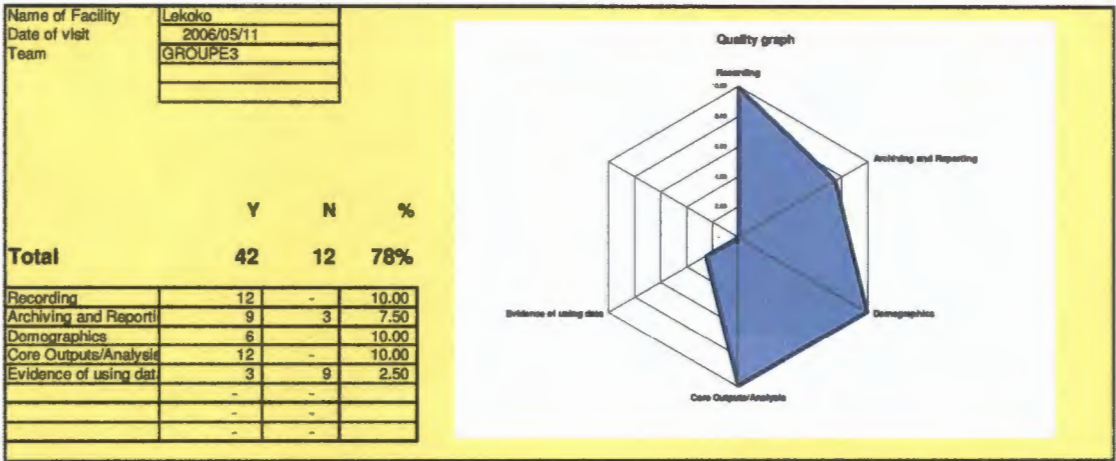


figure 4.5: grader plot- quality graph
(Note 10 = 100%, 8=80%, 6=60%, 4=40% and 2=20%,)

The Lekoko clinic is also amongst the facilities that has scores a ranking of above 6 for most of the categories selected for the study. The only category that was below 4 was the evidence of using data. The facility will have to improve in this category. A 10 ranking has been achieved for the following three categories: Recording, archiving and recording and reporting and last is the core outputs/analysis categories.

4.3.6 Lonley Park Clinic

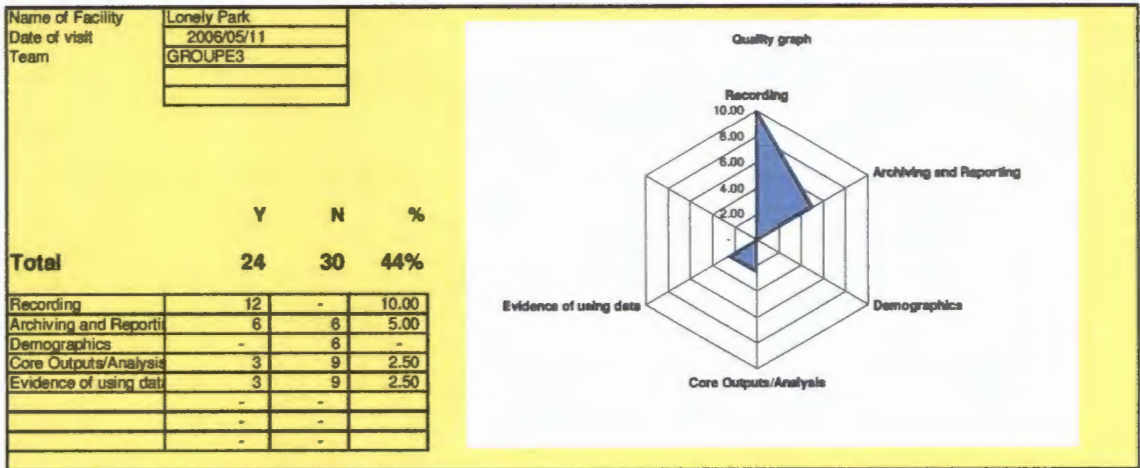


figure 4.6: grader plot- quality graph
(Note 10 = 100%, 8=80%, 6=60%, 4=40% and 2=20%,)

The following figure 4.6 depicts that the facility has complied only with the recording category and has a fairly good archiving and reporting system, but has low scores for all other categories.

4.3.7 Danville Clinic

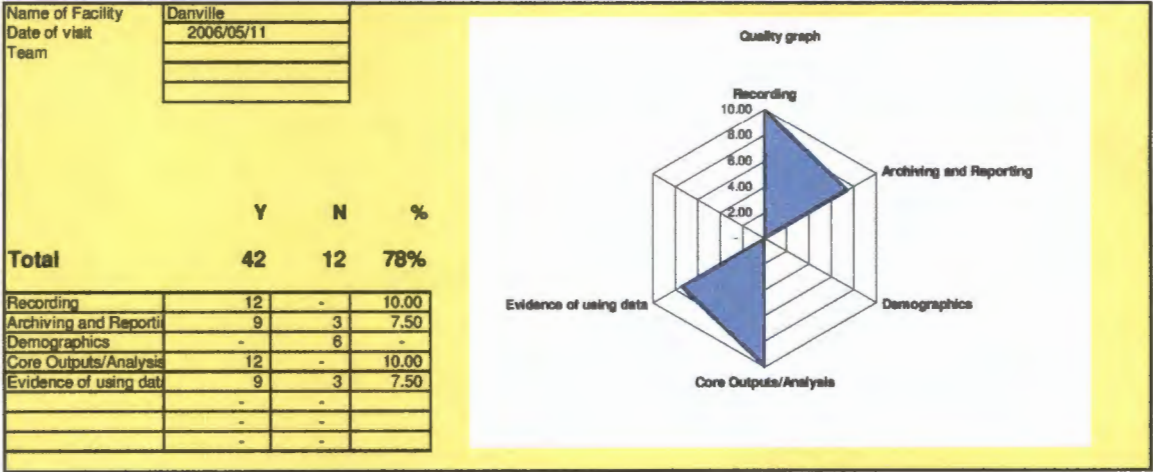


figure 4.7: grader plot- quality graph
(Note 10 = 100%, 8=80%, 6=60%, 4=40% and 2=20%,)

The following figure 4.7 depicts that the facility has complied fully with the Recording and core outputs/analysis categories. It has good archiving and reporting system and also good evidence of using data. The only category that needs improvement is the demographics category.

4.3.8 Summary of all Facilities

The results presented under the quality analysis part 4.3 clearly depict that facilities at the Mafikeng selected facilities have achieved a 100% for recording category. This implies that all facilities have readily available registers, monthly sheet reports and are organized by dates. The other categories overall score for the facilities was recorded in table 4.3.

Table 4.3: Overall results for all selected facilities.

Recording	100.0%
Archiving and Reporting	71.4%
Demographics	50.0%
Core Outputs/Analysis	64.3%
Evidence of using data	53.6%
Grant Total	67.9%

Table 4.3 shows that the facilities have challenges in the areas of evidence of using data and demographics sharing by means of displays at facilities. The overall score is at 67%.

4.4 Results: Data accuracy

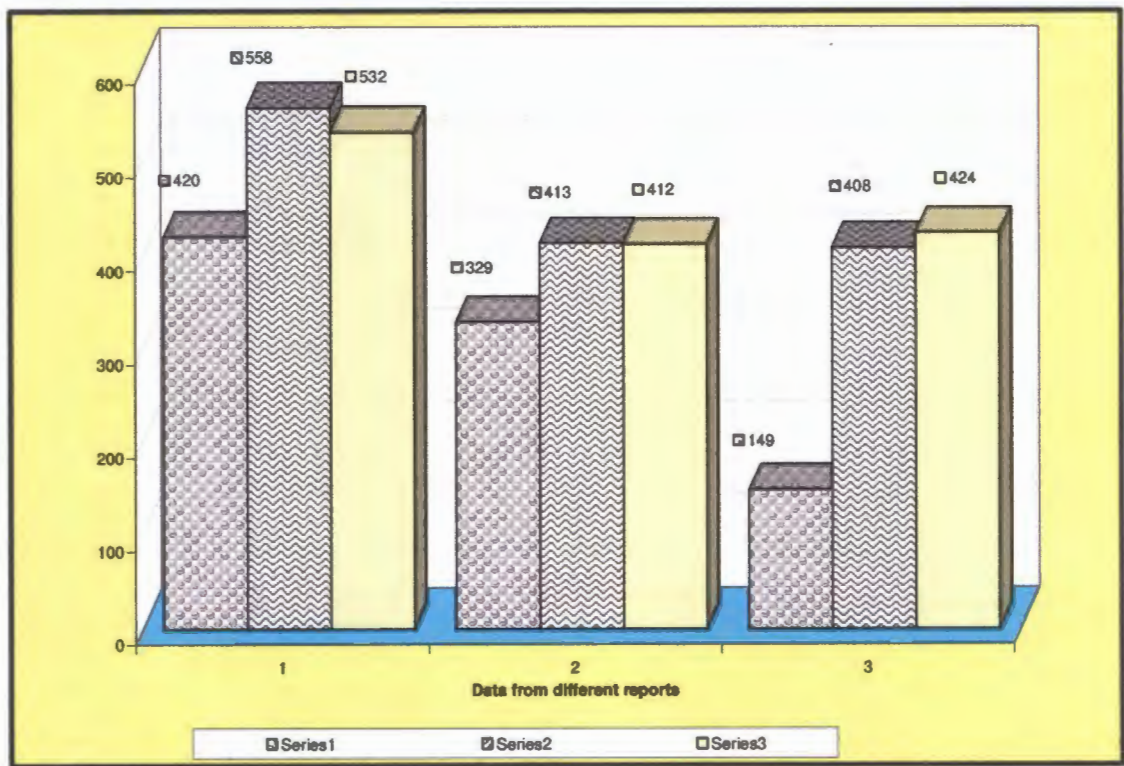


Figure 4.8: Data accuracy for all facilities,

Note: The period is data for 4 months (October, November, December 2006 and January 2007).

Note: questionnaire 2 of the annexure B was analyzed. The graph on figure 4.9 shows how data have been compared for all facilities. The aim was to determine the accuracy of reported data. The following were compared. Series1 – Data from Registers, Series2 – Data from Monthly sheet Reports, and Series 3: Represent data from the DHIS software. The figures are a summary of all facilities data, focusing only on the following data elements.

Data from different reports were collected at facilities and the focus of data elements on the graph being:

- 1. Oral polio vaccine (OPV 3)
- 2. Measles 1
- 3. Fully Immunized

Data accuracy for all the clinics is presented in the figure 4.4. Figure 4.4 shows that the data accuracy that is presented by the district is a challenge, since one would expect that all data presented should have been almost equal to each other, because the main source of data was the register. Figure 4.8 depicts that the integrity of the data reported and compared between the monthly summary reports/sheets versus data on District health information software (DHIS) database, was very high. But the data reported and compared between clinic registers and the one on the monthly summary reports/sheets were different, and therefore its integrity was low.

4.5 Results: TALI Tool

Table 4.4: Displaying of indicators at facilities

	Frequency	%
No	4	57%
Yes	3	43%

Note: the questionnaire 1 of the annexure B was analyzed.

The results shows that only 29% of facilities have displayed catchment population figure and 43% of facilities have displayed at least one or more indicators as according to the Annexure C. This suggests that only 3 facilities are classified under the use of information (Annexure C), which are classified to be at level 2. These facilities are, Danville Clinic, Montsioa CHC, Tsetse clinic, while the most (4) facilities in terms of the Proposed Health Information System Programme (HISP) Basis for Determining Levels of Information Usage (Annexure C) in the Mafikeng Sub-district are still at level 1. That means that these health facilities have:

- an essential dataset defined (or uses that for the District).
- submitted all of the expected reports in the last year within the period set for the submission of reports.
- feedback reports (at a minimum a printout of the data entered into DHIS for this facility for the last few months – standard report) which are received by the facility once data entered into DHIS within the timeframes set for feedback reports.
- the facility manager validating 80% of the feedback reports (checked, signed, and sent back to district information officer if any errors were noted).

The district is however progressing slowing as according to (level 2 of the HISP determination levels) and need to put its recourses and focus to move to the next level (Annexure C). This clearly shows that action taken by the management teams at Health Facility levels on information usage were at a low level.

4.6 Summary of findings

Seven facility managers/data collectors were interviewed, 78% were female. The respondents were aged between 36 and 54 years old. The results show that only 29% of facilities (2 facilities) have displayed catchment population figures and 43% (3) facilities have displayed at least one indicator.

The data quality self-assessment analyses in part 4.2 were categorized into five areas and these areas are: recording, archiving and reporting, demographics, core outputs/analysis and evidence of using data. The result presented under the quality analysis part 4.2 clearly depicts and suggest that generally facilities at the Mafikeng selected facilities have achieved a 100% for the recording category. The other categories overall findings/scores for all these facilities are represented in table 4.5.

Table 4.5: Summary results of all facilities

Recording	100.0%
Archiving and Reporting	71.4%
Demographics	50.0%
Core Outputs/Analysis	64.3%
Evidence of using data	53.6%
Grant Total	67.9%

Table 4.5 shows that the facilities have challenges in the areas of evidence of using data and demographics sharing by means of displays at facilities. The overall score for data quality assessment is at 67%. This implies that the Mafikeng sub-district’s overall quality assessment will need to be standardized, so that the overall figures are increased to over a 90% rate. This will ensure that the district adhere to the National policy’s norms and standards (that is annexure C and E).

Data accuracy analysis showed that the integrity for most of the facilities presented, data reported on the monthly basis by paper and captured (monthly summary sheet reports versus captured data on DHIS), is high. Meaning that the figures reported are the same as the ones captured. But the data that was in facilities clinic registers were different from the ones that was reported on the monthly summary sheet reports. This implies that the figures reported on both DHIS and Monthly sheet reports are not the same as what was on the facility registers.

Lastly, the study's findings on the TALI tool in part 4.5 showed that most management teams at Health Facility level were not using information for action. This also agrees to the outcomes from data quality self-assessment category of evidence of using data and demographics; which is measured at 53%, and was one of the lowest as compared to other categories.

Therefore, in terms of the TALI tool (annexure C) analysis, we can conclude that the Mafikeng sub-district health municipality can be classified to be at level 2. This implies that, at least indicators are graphed at facilities on month to month and these are up dated, also meetings are held to evaluate the data elements/ indicators. This also assumes that level 1 description (annexure C) is adhered to. The challenge for the sub district is how to progress to the next level of using data and information, and to action on recommendations.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter focuses on the conclusions reached from the data analysed as well as the recommendations the study. The chapter begins by firstly looking at the summary of the findings, followed by the limitations of the study.

5.2 Summary of the research results.

Only seven facility managers/data collectors were interviewed, and 71% were female. The respondents were age between 36 and 54 year old. The results show that only 29% of the sampled facilities displayed catchment population figures while 43% of facilities have displayed at least one indicator.

The quality self assessment analysis depicts that the facilities at Mafikeng sub district had a good recording systems in place, which implied that the clinic registers and other monthly reporting sheet/report were always available, filled in and filed. The data accuracy level between the monthly reports versus District health information software (DHIS) database, its integrity was very high.

The level of information use by facilities at the Mafikeng sub district was classified/placed to be at level 2, as according to the TALI TOOL theory, annexure C. This implies that facilities have at least one indicator graphed and displayed monthly, and are up dated regularly, and meetings are held at least once in 6 months to evaluate the data elements and indicators.

5.3 Limitations of the study

Only seven facilities out of a total of 26 were sampled, this may lead to the findings not being generalized. Also, two other strata which are hospitals and mobile services were excluded in the sample. Therefore, the findings may not be applied to these excluded facilities. The current data handling process in the Mafikeng sub district area/facilities is fragmented with poor reporting process within the facilities management structures. Sometimes, at the time of data collection, the researcher could not get the required information and/or data at some facilities because of this poor reporting process.

5.4 Recommendations

It is recommended that a more in depth assessment of data recording at facilities be conducted every six months. Issues that require considerations are figures that are on the DHIS of facilities compared to those on the monthly facility report. These should be compared to those on the registers. All figures reported for the months from these 3 reports must be seen to be correlating. The purpose of this assessment will enable managers to manage the clinics, or hospital wards more specifically, and to assess indicators according to wards, or clinic consulting levels.

The study also recommends that posts of information officers at local facilities be created. Formulation of job descriptions guideline should be clearly defined. There should be interaction with management to obtain buy-in for the role of the information officer's appointment. The current Sub-District Information officer should provide ongoing training and support to strengthen the roles and function at lower level where information officers (data collectors) are based. Management should also be involved in data collection processes.

The study also recommends that under data quality self-assessment, the Mafikeng sub-district office should conduct regular data quality assessment, and data validation at least once in six months.

The Sub-district office should ensure that graphs of key indicators are displayed at facilities on a month to month basis and should provide month to month feedback to facilities on data quality outcomes.

5.5 Suggestions for further studies

Further studies are required in areas of human capital organizational structure at facility level and be compared to work done. Continuous studies on health data accuracy, and information use at lower levels. Also an employee and client satisfaction survey should be conducted at this level.

5.6 Conclusions

In conclusion, according to Arthur Heywood (2003), the need for accurate health statistics and population estimates for the status population is acute. Consistent and reliable data are essential to monitor health status, to assess health needs, and to plan, fund, and deliver health care programs to the province's aboriginal people.

The outcomes of evaluation of information use at Mafikeng sub-district health facilities indicated that data accuracy was a challenge at most health facilities. The record keeping of registers and records/reports of data (statistics) submitted to the district office monthly were always readily available at all facilities.

The study also pointed out that the most important principle is to act on information. Managers must know how to use information to improve the facility's functioning. The people on the ground level who record the information need to know the importance and relevance of the data so that care is taken to record it correctly. Good management is a precondition for increasing the effectiveness of health services. Effective health

management relies on information at every stage of planning, implementation, monitoring and evaluation of health services.

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Annexure A: Facility List and Sampling technique

Location	Organisational type	Number	Facility Name	Is DHIS decentralized
Ramatlabama Local Service Area	Clinic	1	Lokaleng	No
		2	Miga	No
		3	Mogosane	No
		4	Tlapeng (Mafi)	No
		5	Tsetse	No
	Community Health Centre	6	Ramatlabama CHC	No
	Mobile Service	7	Ramatlabama Mob	No
Modimola Local Service Area	Clinic	8	Gelukspan	No
		9	Gateway	No
		10	Lekoko	No
		11	Masutlhe 1	No
		12	Tshunyane	No
		12	Weltevrede	No
	Mobile Service	13	Modimola Mob	No
Unit 9 Local Service Area	Clinic	14	Lonely Park	No
		15	Montshioa	No
		16	Clinic	No
	Community Health Centre	17	Motlhabeng	No
		17	Unit 9 CHC	No
	Mobile Service	18	Gelukspan Mob	No
Montshioa Stadt Local Service Area	Clinic	19	Danville	No
		20	Dithakong (Mafi)	No
		21	Mafikeng	No
		22	Gateway	No
		23	Magogwe	No
		24	Matlhonyane	No
	Community Health Centre	25	Rapulana	No
		25	Montshioa CHC	No
	District Hospital	26	Victoria Hosp	No
	Mobile Service	27	Montshioa Mob	No
Unit9 Local Service Area	Clinic	28	Mocoseng	No
MontshioastadtLocal Service Area	Clinic	29	Matshepe	No
Mafikengt Local Service Area	Regional Hospital	30	Mafikeng Hosp	Yes
Lekoko Local Service Area	Clinic	31	Modimola	No
	Community Health Centre	32	Lekoko CHC	No
Mafikeng Local Service Area	District Hospital	33	Gelukspan Hosp	Yes

DHIS decentralised

2 Hospitals (Included by default in the selection)

DHIS not Decentralised

3 CHC

22 Clinics

Stratified sampling of facilities (without replacement)

Total	Selection	No that should be randomly selected
4 CHC	50%	2 CHC
22 Clinics	23%	5 Clinics

ANNEXURE B – Three Questionnaires

Questionnaire 1

MBA degree program - North West University, Mafikeng Questionnaire for Data collector.															
Statement of Confidentiality <i>All information that would permit identification of you will be regarded as strictly confidential, will be used only for the purposes of operating and evaluating the study, and will not be disclosed or released for any other purposes without your prior consent.</i>															
Please tick with an X in the relevant box?															
Personal Details District Name: _____ Clinic/Hospital Name: _____ Information about the person who is responding to this questionnaire. i. Gender - M / F: _____ ii. Age _____ iii. Population group : African, Coloured, Indian, White : _____															
Questions															
1 Is this facility using DHIS software? 2 Do you have Catchment population displayed at your facility? 3 Are Health indicators Displayed in your facility? 4 How many indicators are displayed?	Yes:No <table border="1" style="margin: auto;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>														
	<table border="1" style="margin: auto;"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Strongly Agree</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Agree</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Neutral</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Disagree</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Strongly Disagree</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> </tr> </table>					Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree											
1	2	3	4	5											
5	Do all the reports from the previous year (monthly) have at least one date stamped or written on it as "signed date" or "compiled date" by the HF?														
6	Are the health monthly forms completely filled in?														
7	Can copies of all previous monthly forms (Jan-June 2005) from this Health Facility be retrieved?														
8	Is there the latest feedback on data from sub-district/district easily available?														
9 Currently I am employed at LEVEL : _____															
10 Comments, Suggestions and Questions _____ _____															

MBA degree program - North West University, Mafikeng Questionnaire for Manager.

Statement of Confidentiality

All information that would permit identification of you will be regarded as strictly confidential, will be used only for the purposes of operating and evaluating the study, and will not be disclosed or released for any other purposes without your prior consent.

Please tick with an X in the relevant box?

1 Personal Details

District Name: _____

Clinic/Hospital Name: _____

Information about the person who is responding to this questionnaire.

i. Gender - M / F: _____

ii. Age _____

iii. Population group : African, Coloured, Indian, White : _____

- 1 Is this facility using DHIS software.?
- 2 Do you have Catchment population displayed at your facility?
- 3 Are Health indicators Displayed in your facility?
- 4 If yes how many indicators are displayed?

Ye:No

☐	☐
☐	☐
☐	☐

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	2	3	4	5

5	Do all the reports from the previous year (monthly) have at least one date stamped or written on it as "signed date" or "compiled date" by the HF?					
6	Are the health monthly forms completely filled in?					
7	Can copies of all previous monthly forms (Jan-June 2005) from this Health Facility be retrieved?					
8	Is there the latest feedback on data from sub-district/district easily available?					

9 Currently I am employed at LEVEL : _____

10 Comments, Suggestions and Questions

Questionnaire 2: Data accuracy tool

Data Collection at facility/Sub-District Level

Year2005

FACILITY NAME

N°	Tool	DPT3 Coverage							Measles 1 Coverage							Fully Immunized						
		JAN	FEB	MAR	APR	MAY	JUN	TOTAL	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1	DHIS at facility																					
2	Monthly Summary																					
3	Clinic Register / Collection tool																					

N°	Tool	Total Deliveries							Total Births						
		JAN	FEB	MAR	APR	MAY	JUN	TOTAL	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1	DHIS														
2	Monthly Summary														
3	Clinic Register / Collection tool														

**STANDARD
QUESTIONS TO
ASSESS THE QUALITY
OF MONITORING
SYSTEM**

North West Province

PART A:FACILITY LEVEL

RECORDING			
NO	QUESTION	COMMENT	SCORE (0, 3)
1.	Are the data collections tools used standardized ?	Standardized as provided by Province: Tally sheet Monitoring chart Monthly summary Vaccinators manual	
2.	Does the form reflect: • Name and signature of Health worker • Date of reporting • Name of facility	To assess accuracy and completeness	
3.	Are the tools available	Are they in stock	
4.	Observe at least five vaccinations: Were all vaccinations well registered on the child health card/Register?	Observation of 5 children during immunization day: Correct registry entry	
5.	Are the HU reports completely filled in?	Review all fields on the report for Jan-June 2005	
6.	Are the data elements and their definitions common/standardized?	Availability of standard data elements to be reported on Availability of definitions	

ARCHIVING AND REPORTING			
NO	QUESTION	COMMENT	SCORE (0, 3)
1.	Can copies of all previous reports from this HF be found in the HF?	Check and review previous reports for Jan -June 2005	
2.	Is there one location where the previous immunization reports and recording forms are stored?	Availability of a place where files or forms are kept Are they organized by date?	
3.	Are the immunization registers available for all months of the previous year?	All previous year= 100%	
4.	Is the monthly feedback on data from district easily available?	Did the HU receive feedback from the last visit? No of reports in the last six month	
5.	Is there a back up system	Copies of the chart	

DEMOGRAPHIC INFORMATION			
NO	QUESTION	COMMENT	SCORE (0, 3)
1.	Does the HF have data on the number of under 1 and under 5 born in their catchment area?	- Does the HF know its catchment area population? - Does the HU know its target population (<1 year) and (<5 year) - Is there a map at HU indicating hard to reach areas & special populations	
2.	Does the HF have a target set on the number of children that should be vaccinated annually?	Are there monthly targets in line	
5.	Does the HF have a catchment map including outreach services?	To assess/highlight low performing areas	

CORE OUTPUTS/ ANALYSES

NO	QUESTION	COMMENT	SCORE (0, 3)
1.	What actions were taken by HF to address areas of concern	Are the micro plans in place Implementation and intervention strategies in place	
2.	Does the HF share information with communities and all relevant stakeholders?	Feed back reporting • Community meetings • Brochures • Clinic committees • Minutes available • Attendance register	
3.	Have any actions taken to address high drop out rates?	• Monthly charts to monitor thee indicator	

EVIDENCE OF USING DATA FOR ACTION			
NO	QUESTION	COMMENT	SCORE (0, 3)
1	Is there a tracking defaulter system in the health facility	Assess the availability of defaulter tracking system	
2	Does the health facility monitor drop out rate?	To assess whether there are activities in place	
3	Does the facility monitor wastage?	Reasons for wastage and how to reduce it	
4.	Is there a monthly chart of graph analysed, interpreted and compared to the previous years?	Asses information usage in the HF	

**ANNEXURE C: Proposed HISP Basis for Determining Levels of Information
Usage for the PHC Dataset (tali-tool)**

Level 1:	Level 2	Level 3
Facility:		
Facility has an Essential Dataset defined (or uses that for the District) Has submitted all of the expected reports in the last year within the period set for the submission of reports (this period may vary from district to district) Feedback reports (at a minimum a printout of the data entered into DHIS for this facility for the last few months – standard report) are received by the facility once data entered into DHIS within the timeframes set for feedback reports. The facility manager has validated 80% of the feedback reports (checked, signed, and sent back to DIO if any errors were noted).	At least 4 indicators are graphed for the year and up to date for the year and up to last reported month. At least 3 meetings were held in the last 6 months to evaluate the data elements/ indicators.	At least one problem has been identified and addressed through an action plan. The effect of the action has been monitored and can be shown. The actions are documented in a written report to the District, the clinic committee, or the annual report.
District:		
District has a Essential Dataset defined District has received 95% of expected reports¹ from facilities for the last	District has determined which reports (detailing indicators with targets for their area of responsibility for the last	At least three problems have been identified and addressed through an action plan.

¹ This is not data coverage which is a different indicator

Level 1:	Level 2	Level 3
Facility:		
reporting month within the period set for the submission of reports.	reported month) are required for each manager.	The effect of the action has been monitored and can be shown. The actions are documented in the annual report or other written report.
100% of expected feedback reports have been issued within the timeframes set for feedback reports.	At least 80% of expected reports are made available within the expected timeframe.	
Validation checks (data integrity checker, identify duplicate records, absolute and expert rule violations run on each monthly submission as entered ²) have been run for each facility/district at least quarterly.	At least 4 indicators with targets are graphed in the district office for the year and up to the last reported month.	
Data range levels have been set for the district at least once in the last 6 months	The District office has held at least 3 meetings in the last 6 months to evaluate the indicators.	

² Evaluation of the data from a district will thus reveal that there are no absolute rule violations, and all expert validation rules have been commented on.

Province:		
Province has a Minimum Essential Dataset defined³ Province has received reports from 95% of districts for the last reporting month within the period set for the submission of reports. 100% of expected feedback reports to districts have been issued within the timeframes set for feedback reports.	Province has determined which reports (detailing data / indicators and targets for their area of responsibility for the last reported month) are required for each manager At least 80% of expected reports are made available within the expected timeframe. At least 8 indicators are graphed in the provincial office for the year and last reported month. The Provincial office has held at least 3 meetings in the last 6 months to evaluate the indicators.	At least 5 problems have been identified and addressed through an action plan. The effect of the action has been monitored and can be shown. The actions are documented in the annual report or other written report.
National:		
National has a Minimum Essential Dataset defined National has received reports from 95% of provinces for the last reporting month within the period set for the submission of reports. 100% of expected feedback reports to provinces have been issued within the timeframes set for feedback reports.	National has determined which reports (detailing data / indicators and targets for their area of responsibility for the last reported month) are required for each manager. At least 80% of expected reports are received within the expected timeframe. At least 10 indicators are graphed in the national office for the year and last	At least 5 problems have been addressed through an action plan. The effect of the action has been monitored and can be shown. The actions are documented in the annual report or other written report.

³ As determined by it having its own additional indicators, the data elements to determine these indicators, and validation rules to ensure data quality.

	reported month. The National office has held at least 3 meetings in the last 6 months to evaluate the indicators.	
--	---	--

ANNEXURE D: Monthly Data Collection Tools and Indicators

1. Data Element

Routine Monthly Data Input Form

Sub-District:

Completed by: _____

Month: _____

Facility:

Verified by: _____

Sign: _____

Sign: _____

No	Data Element	Normal range	Value	Comment
Immunisation				
13	BCG doses to children under 1 year	0	0	
14	OPV doses at birth	0	0	
15	DTP-Hib 1st doses to children under 1 year	33	85	
16	DTP-Hib 3rd doses to children under 1 year	32	83	
17	OPV 1st doses to children under 1 year	33	87	
18	OPV 3rd doses to children under 1 year	32	83	
19	HepB 1st doses to children under 1 year	33	87	
20	HepB 3rd doses to children under 1 year	32	83	
21	Measles 1st doses to children under 1 year	24	97	
22	Measles 2nd doses	28	89	
23	Immunised fully under 1 year - new cases	24	98	
24	Vitamin A 100,000 units to infants 6-11 months	30	142	
25	Vitamin A dose 200,000 units given to child 12-60 months of age	57	304	
138	DT doses at 5 years	31	53	
214	DTP doses at 18 months	61	81	
215	OPV doses at 18 months	61	81	
216	DT 1st doses 2 years and older	0	1	
217	DT 2nd doses 2 years and older	0	0	
218	DT 3rd doses 2 years and older	0	0	
219	OPV doses at 5 years	31	53	
223	HepB 2nd doses to children under 1 year	57	84	
224	DTP-Hib 2nd doses to children under 1 year	71	89	
225	OPV 2nd doses to children under 1 year	57	84	
Curative Care				
30	Patients diagnosed with HIV/AIDS - new females	10	23	
31	Patients diagnosed with HIV/AIDS - new males	9	17	
45	Multi-Drug Resistant Tuberculosis cases - all	0	5	
46	Trauma cases - accidental	8	37	
47	Assault cases under 15 years	0	4	
48	Assault cases - women 15 years and above	0	7	
49	Assault cases - men 15 years and above	0	6	

Month: _____

Sub-Dis: _____

Completed by: _____

Sign: _____

Facility: _____

Verified by: _____

Sign: _____

No	Data Element	Normal range	Value	Comment
Reproductive Health				
62	Oral pill cycles (packets)	163	365	
63	Medroxyprogesterone injections	180	463	
64	Norethisterone enanthate injections	152	332	
65	IUCDs inserted	0	0	
66	Emergency contraceptions	0	4	
67	Male condoms distributed	564	3,285	
68	Referred for Termination of Pregnancy	0	3	
69	Cervical smear 30 - 50 years	4	24	
198	Contraceptive users under 18 years	81	163	
199	Contraceptive users 18 years and older	448	680	
Drug Prescribing				
33	Prescriptions issued	2,863	5,258	
34	Items dispensed	6,941	11,576	
207	New patients diagnosed with HIV/AIDS	0	13	
Referrals				
36	Referred to doctor (this or other facility)	250	575	
37	Referred to doctor at next level	45	130	
Maternal Health				
38	Antenatal 1st (booking) visits before 20 weeks	0	0	
39	Antenatal 1st (booking) visits 20 weeks or later	0	0	
40	Antenatal follow-up visits	0	0	
72	Antenatal clients with syphilis - new	0	0	
Attendance				
1	PHC headcount under 5 years	1,004	1,705	
2	PHC headcount 5-59 years	3,685	4,941	
3	PHC headcount 60 years and older	378	687	
4	DOTS visits - Facility (also included in headcount)	33	476	
35	PHC cases seen by doctor in this facility	248	575	
Management				
5	Nurse clinical work days (PHC)	160	160	
6	Doctor clinical work days (PHC)	9	9	
Child Health and IMCI				
7	Children under 5 years weighed (record only once per month)	1,034	1,729	
8	Of those weighed, children under 5 years not gaining weight this month	7	27	
9	Severe malnutrition under 5 years - new cases	0	5	
10	Curative cases under 5 years	226	467	
11	Diarhoea cases under 5 years - new	13	56	
12	Lower respiratory infection cases under 5 years - new	0	106	
138	Underweight for age under 5 years - new cases	0	11	
221	Preventative services under 5 years	667	864	
222	PEM clients under 5 years	36	65	

Routine Monthly Data Input Form

Month: _____

Sub-Dis: _____

Completed by: _____ Sign: _____

Facility: _____

Verified by: _____ Sign: _____

No	Data Element	Normal range	Value	Comment
Sexually Transmissible Infections				
26	STI treated using the Syndromic approach - new episodes	28	84	
27	Male Urethritis Syndrome treated - new episodes	7	28	
28	STI partner notification slips issued	5	88	
29	STI partners treated - new cases	0	28	

Chronic Care

50	Diabetes mellitus visits	86	124	
51	Diabetes mellitus cases put on treatment - new	0	3	
52	Hypertension (high blood pressure) visit	784	1,143	
53	Hypertensives put on treatment - new	0	28	
54	Epilepsy visits	97	162	
55	Epilepsy cases on treatment - new	0	2	
56	Chronic Obstructive Airway disease visits	34	117	
57	Chronic Obstructive Airway Disease - new cases	0	3	

Mental Health

32	Mental health clients 18 years and older - new	0	0	
59	Mental health clients 5-17 years - new	0	0	
60	Follow-up mental health visits	100	356	

ANNEXURE D: Monthly Data Collection Tools and Indicators

2. Health Indicators

No	Indicator Name	Indicator Type
1	Data input coverage	%
2	Utilisation rate (annualised)	Nox12
3	Utilisation rate under 5 years (annualised)	Nox12
4	Utilisation rate 5 years and older (annualised)	Nox12
5	Nurse clinical workload	No
6	DOTS case load	%
7	Child case load	%
8	Not gaining weight under 5 years rate	%
9	Weighing case load	%
10	Severe malnutrition under 5 years incidence	per1K
11	Severe malnutrition under 5 years rate	%
12	Weighing coverage (annualised)	%x12
13	Immunisation drop out rate (DTP1-3)	%
14	Immunisation drop out rate (BCG-DTP3)	%
15	Immunisation drop out rate (DTP3-measles1)	%
16	Immunisation coverage under 1 year (monthly)	%
17	Immunisation coverage under 1 year (annualised)	%x12
18	Measles 1st dose coverage (annualised)	%x12
19	BCG coverage (annualised)	%x12
20	OPV 3 coverage (annualised)	%x12
21	Immunisation drop out rate (Measles1-2)	%
22	Vitamin A coverage infants 6-11 months (annualised)	%x12
23	Vitamin A coverage children 12-60 months (annualised)	%x12
24	Curative case load under 5 years	%

No	Indicator Name	Indicator Type
25	Diarrhoea incidence under 5 years	per1K
26	Lower respiratory Infection incidence under 5 years	per1K
27	Antenatal coverage rate (annualised)	%x12
28	Antenatal case load	%
29	Antenatal visits per antenatal client rate	No
30	Antenatal visits before 20 weeks rate	%
31	Tet Tox coverage of pregnant women (annualised)	%x12
32	Tetanus Toxoid protection rate for antenatal clients	%
33	Vitamin A coverage - maternal (annualised)	%x12
34	Low birth weight rate	%
35	Unbooked delivery rate	%
36	Still birth rate	%
37	Institutional delivery rate to women under 18 years	%
38	Referral for TOP incidence	per1K
39	Cervical smear coverage (Annualised)	%x12
40	Women year protection rate (monthly)	%
41	Women year protection rate (annualised)	%x12
42	STI partner tracing rate	%
43	Incidence of STI treated - new episodes (annualised)	%x12
44	Incidence of MUS treated – new episodes (annualised)	%x12
45	Male Urethritis Syndrome rate	%
46	Male condom distribution rate (annualised)	Nox12
47	Mental illness prevalence	per1K
48	Hypertension incidence	per1K
49	Diabetes mellitus incidence	per1K
50	Referral rate to doctor at next level	%
51	Items per prescription	No
52	Population density	No

ANNEXURE E: NHIS/SA Committee – Data flow Policy

1. Background

The District Health Information System (DHIS) Software has been rolled out to all Health Districts in South Africa, but we are still experiencing delays and bottlenecks in the flow of data – in particular from the provinces to the National DoH.

Clear guidelines for the data flow process, including deadlines, must be put in place so that all stakeholders know what is expected.

The Data Flow Guidelines below are based on four principles:

Reciprocity between the provider and recipient – Reception of data to be followed by feedback. In practice, this means that enforceable deadlines for feedback are as important as submission deadlines.

Issues of data quality and completeness must be handled and resolved at the facility and sub-district levels to facilitate sustainability – district, provincial and national managers should refer any quality/completeness issues back to those levels. In practice, this means that the facility and sub-district levels – where data is generated and/or captured – need more time than district/provincial levels, where data already validated can be passed on quickly.

Health Districts/sub-districts should where feasible provides health facilities with one or more PCs, install the DHIS Software + a dial-up link with email, and train facility staff and managers to capture, validate, and use their own data. This not only speeds up data capture and validation, it also increases computer literacy and feelings of ownership and pride towards their own data/information at relatively low cost.⁴

As soon as public sector (including Local Government) data is reasonably complete and consistent, each province and/or district should gradually expand their data collection

⁴ The Free State introduced several years ago PCs with email/network link in many PHC facilities, with considerable success. The City of Cape Town, which has provided PCs with a dial-up link in all PHC facilities and installed the DHIS, now gets all the data within 6 working days.

efforts to the private sector. Complete coverage of data related to key programme areas (immunisation, Tuberculosis, Sexually Transmissible Infections, HIV/AIDS, cervical cancer, etc) is a priority.

The standard DHIS term “Organisational Unit Level” (OrgUnitLevel) is used to specify the flow:

- OrgUnitLevel 1 is the National DoH
- OrgUnitLevel 2 is the 9 Provincial Administrations
- OrgUnitLevel 3 is the 53 District/Metropolitan Municipalities or Health Districts
- OrgUnitLevel 4 is the 150-200 Health Sub-districts
- OrgUnitLevel 5 is the 5-10,000 public and private health facilities

2. Objective

To ensure that complete data sets of sufficient quality are available at all levels as soon as possible after the end of a report period (month/quarter).

3. Steps

Step 1 – Data Flow Activity at OrgUnit 5 level (facilities)

Routine Data Sets: Public PHC facilities: PHC Essential Data Sets (EDS)

Public Hospitals: Hospital data *and* sections of the PHC Data Sets

Transport/EMS: Transport/EMS Essential Data Sets

Environmental Health: Environmental Health Essential Data Sets

Private Hospitals: Hospital data *and* sections of the PHC Data Sets

Private PHC facilities: PHC Essential Data Set

(Other sources or routine data sets might be added later).

Responsibilities: Collate all relevant data from tally sheets, (tick) registers, and similar

Ensure they are complete and as correct as possible

Submit and retain copy

Respond to queries from sub-district office

Capture and validate data (if computer with DHIS Software available)

Analyse and present data to staff

Export and send/email data set to sub-district office (level 4).

Submitted within: 12 working days (paper) or 6 working days (email) after end of period.

Step 2 – Data Flow Activity at OrgUnit 4 level (Health sub-District)

Responsibilities: Capture all data from paper forms submitted and/or import facility data

Import raw data from other sources (TB Register, TransAid, etc)

Use visual inspection and DHIS Software validation tools to ensure correctness and completeness – follow up problems with facilities and/or supervisors.

Standard RG and pivot reports feedback to facilities and supervisors.

Export all new and modified data to the Health District Office (level 3).

Exported within: 18 calendar days after end of reporting period.

Step 3 – Data Flow Activity at OrgUnit 3 level (Health District)

Responsibilities: Import raw data from the Health sub-districts

Follow up problems with the Health sub-District team, and import updates.

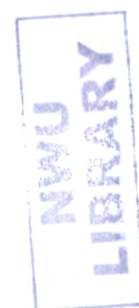
Standard RG and pivot reports to district and programme managers at Health District and Health sub-District levels (feedback).

Export all new and modified data to the Provincial Office (level 2).

Exported within: 15 calendar days after end of reporting period.

Step 4 – Data Flow Activity at OrgUnit 2 level (Province)

Responsibilities: Import raw data from the Health Districts



Standard RG and pivot reports to provincial and programme managers

Use standard RG and pivot reports as feedback to Health Districts, but include comparative data quality analysis per Health sub-Districts.

Export data to web-based Data Mart (if available), which might be used as an alternative mechanism for regular feedback.

Export all new and modified data to the National Office (level 1).

Exported within: 15 calendar days after end of reporting period.

Step 5 – Data Flow Activity at OrgUnit 1 level (National DoH)

Responsibilities: Import raw data from the provinces and copy onto National Server

Export semi-processed data to web-based Data Mart, which might be used as an alternative mechanism for regular feedback to provinces.

Standard RG and pivot reports to national and programme managers

Use standard RG and pivot reports as feedback to the provinces and Health Districts, but include comparative data quality analysis per province.

Export relevant new and modified data to WHO (“level 0”).

Exported within: 15 calendar days after end of reporting period.

Total number of days from facility to NDoH is 75 days

Note: All levels can be expected to produce, regularly or ad-hoc, more comprehensive reports, slideshows, maps, Business Plans, Budget proposals, pamphlets and other materials for a variety of purposes and audiences. As more Health Districts and Provinces reach level 3 (regular use of data/information for decision-making), such outputs might be formalised with deadlines etc. The most obvious examples are monthly reports linked to Business Plans, monitoring targets and effects of interventions, and aimed at for instance top managers and elected councillors – but in order for this to

happen, the standard “click and print” RG reports and pivot tables must be availed to managers at all levels.

4. Monitoring Compliance

Each Health District/Provincial administration, and the National Office, should every quarter compile a brief report outlining to what extent the guidelines are followed.

5. Service Delivery Agreements

The NHISSA committee recommends that all provinces and District/Metropolitan Municipalities include the relevant sections of the Data Flow Guidelines above in their future Service Delivery Agreements.

ANNEXURE F: Example of an indicator as according to a health Context.

(Source: Barron and Monticelli (2007) have been quoted below as follows:)

What is an indicator?

In order to manage health services well and to maximize the health of the population who use these services, managers need to know the answers to number of questions. These include questions about the health of people:

Who gets sick?

What illnesses are most common?

Where do these people live?

They also include questions about the health services:

What health services are provided?

Who uses these services?

What is the quality of these services?

How much do these services cost?

Health indicators can help in answering these questions. Health indicators are normally numbers or values that can be measured and that can reflect changes over time. They are yardsticks that can be used in the monitoring process. They often are used as markers as to how well the health system is performing. While indicators are useful tools for measuring change, they also have limitations. Some of these limitations are: Indicators are used to alert managers to potential problems, possible causes for these problems and addition l questions to be asked. Indicators rarely give the cause of problems themselves. An isolated indicator by itself does not mean much. It needs comparison over time and cross facilities and districts, to show trends in order to be useful.

For example, one indicator for monitoring the health of an individual is his/her heart rate. This can be calculated by firstly counting the pulse of that person for 30 seconds. Let's

say the count is 40 beats. The heart rate is calculated by working out how many beats there are in one minute. This simple illustration of an indicator can be used to compare an individual's health over time and it can also be used to compare the individual with other individuals.

Indicators can be compared over time with other facilities (or are as) that are using the same indicator.

Example:

Indicator: Cost Per Patient Day equivalent

Definition: This indicator measures the average cost per patient per day seen in hospital. (expressed as Rands per patient day equivalent).

Calculation:

Total expenditure of the hospital divided by the patient day equivalent (PDE). The PDE is calculated by adding the number of inpatient days plus $\frac{1}{2}$ of day patients plus $\frac{1}{3}$ of outpatient and emergency room visits.

Practical exercise:

District hospital A has 150 usable beds. During the year (1 April 2006 to 31 March 2007) there were 34 100 inpatient days and 400 day patients in this district hospital. There were also 14 010 outpatient visits and 1 440 emergency visits during working hours and during after hours. The expenditure of the hospital included staff costs which totalled R29 450 420; drugs and other consumables which came to R3 674 000 and all other costs which totalled R4 256 000.

Then the Total hospital expenditure for 2006/7 = R29 450 420 + R3 674 000 + R4 256 000
= R37 380 420

Patient Day Equivalent (PDE) for 2006/7 = Inpatient days + 1/2 day patients + 1/3 (OPD + emergency visits)

$$= 34\,100 + (1/2 \text{ of } 400) + 1/3 (14\,010 + 1\,440)$$

$$= 34\,100 + 200 + 1/3 (15\,450)$$

$$= 34\,100 + 200 + 5\,150$$

$$= 39\,450$$

Target:

The recommended PDE for district hospitals is set by the national Department of Health for the 2006/7 year is R814.

Purpose:

It is an indicator of efficiency that combines elements of input and output. This indicator measures how efficiently the resources available to the hospital are being spent.