

# The EQUITY Project

*strengthening equitable access to quality health services for all South Africans*



## USING INFORMATION FOR ACTION

A manual for health workers  
at facility level



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# Health Information Systems Program

South African Version



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# USING INFORMATION FOR ACTION

## A manual for health workers at facility level

This manual, based on years of training programs, seminars, and workshops, was developed to record the many different elements of a smoothly working information system for health services in South Africa. While aiming to present and communicate this information in an attractive and clear fashion, we, the authors, distilled its contents from the experiences of and discussions held throughout the country with health workers, information officers, and managers. It is these frontline workers who are both responsible for the data, which is then turned into information, and for the provision of quality services.

We offer our thanks and acknowledgements to the thousands of health workers in South Africa who are now collecting and using data themselves to improve their performance. We would also like to thank the members of the Health Information System Project (HISP) team, who have participated in training programs throughout the country. We are indebted to them for their many insights and teaching ideas. Together with colleagues from the MSH/EQUITY technical assistance team, they have helped to devise the approaches to training workers in the use of health information.

We also offer our acknowledgement and thanks to our counterparts in government at all levels--from the National Health Information System of South Africa to the National Directorate for Health Information, provincial information officers, district information officers, and managers. We also wish to thank the hundreds of staff who have eagerly learned and contributed with their questions and suggestions.

This manual was prepared in the spirit of Batho Pele, in the hopes that more transparent and clearly usable information about health will indeed contribute to the improved health of all the citizens of this country. To that end, we offer this publication as a contribution to the many nameless community members, clinic committees, hospital boards, and other interested citizens whose knowledgeable involvement in the health care system should be enhanced by improved and objective health information, thus establishing a healthier society in all of South Africa.

Authors:

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# Foreword

A central theme of the EQUITY Project has been the importance of monitoring what we do through the use of timely and valid information. While previously health services were fractionated and often unaccountable, since 1997, in partnership with NDOH, ECDOH and HISP - UWC, the EQUITY Project has helped to inculcate a sense of objectivity into health workers at all levels.

By defining information needs for managers and service providers alike, we have been able to focus attention on the essential data to be collected at service delivery points. The data is then collated and analysed monthly in order to both improve accountability and to assure quality health services. This manual for health workers is an important contribution to that effort, as it spells out in detail the elements of the health information cycle and enables workers at the facility, district and provincial level to understand the principles of the district health information system (DHIS) as it has been formulated and implemented throughout the Eastern Cape Province as well as the entire South Africa.

Information is key to good management and a crucial aspect of a responsible and accountable health system. The DHIS makes sound decisions more possible based on timely and accurate information coming from the field. Even more importantly, it enables workers in the primary health care system to know what they are doing and to measure their own success. Through monthly review of the data at each facility, service providers can portray their successes through graphs and tables and demonstrate to themselves and to the community they serve progress in health care for all.

The EQUITY Project continues to believe that sound information as described in this manual will contribute substantially to improved equity throughout the health care system throughout South Africa. We commend this manual and its many ideas to every health worker in the country.

**Dr Thobile Douglas Mbengashe**  
**DIRECTOR: EQUITY PROJECT**

# Foreword

Managers at all levels need appropriate routine information to analyse the health situation, set relevant objectives, and make appropriate plans which can then be locally-monitored using pre-defined indicators. Most importantly, the availability of good quality, timely and complete data from all service delivery points is crucial to support the district health system. Since its inception in 1992, the University of Western Cape (UWC) School of Public Health (SoPH) has maintained primary health care management as a core theme to improve quality and coverage of health services; the Health Information System Program (HISP) has been central to our activities since 1994.

Working closely with the EQUITY Project partners, the SoPH has applied the results of HISP operational research to improve service delivery and problem-solving through team training. The program, which started as a small-scale project in three districts around the university, now operates in all South African districts, as well as other countries in Africa and Asia. HISP research helped develop a conceptual framework and computer program for the District Health Information System, thus contributing to national roll out and monitoring and evaluation strengthening.

HISP also participated in extensive training of more than 3000 front-line health workers across all nine provinces. As a concrete output of this empowerment process, this manual answers many of the frequently asked questions and outlines key issues presented during district-level training.

Throughout South Africa, the HISP process has had its greatest impact at the service delivery level. Participants in this process have learned to rationalise data, streamline information flow, and develop both manual and computerised tools to improve analysis and presentation, thereby encouraging health staff to calculate indicators and monitor achievements. Combined with appropriate feedback from district teams, this process analysis enables program and facility managers at all levels to assess performance over time and to measure progress towards district and national targets.

This manual, intended for service providers and facility managers, explains in detail how you can contribute to improved health service management by collecting, analysing and using data to improve both coverage and quality of primary health care activities throughout the country.

Good luck implementing the District Health Information System.

**Professor David Sanders**  
**DIRECTOR: University of Western Cape**  
**SCHOOL OF PUBLIC HEALTH**

# Chapter 1

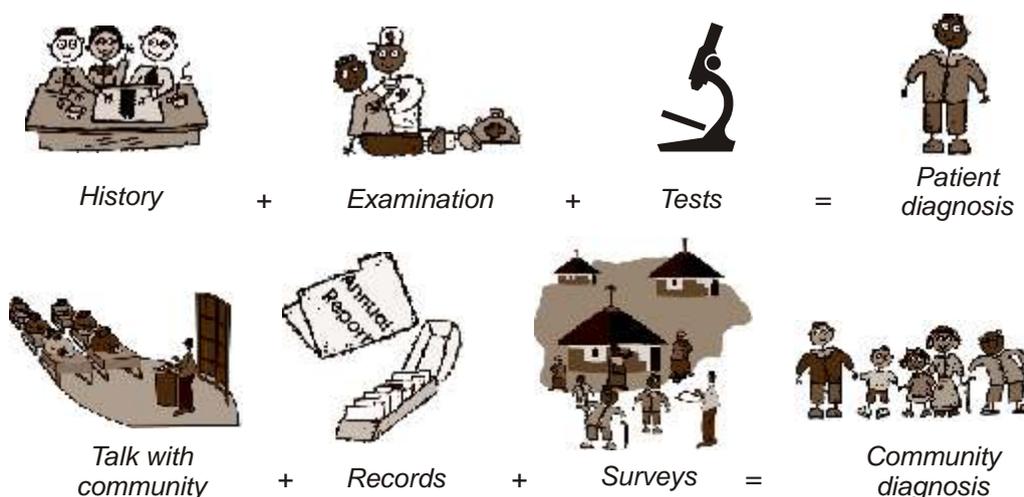
## Introduction to a Health Information System

Every health worker collects data routinely, but most never use it to improve health services. This manual is about converting data already routinely collected at the facility into useful, population-based information that answers basic questions about the health of the people served, and which can be used for practical management of primary health care (PHC) services in South Africa.

### INFORMATION FOR A COMMUNITY DIAGNOSIS

Every time you see a patient, you take a **history** to get information on what the problem is, how long it has been present, how it has progressed, etc. You then do an **examination**, look at the affected area, feel it, move it and get a better idea of what is wrong. Sometimes at this point you can make a diagnosis, but often you need to do additional **tests** - laboratory tests, X-ray or other - to get a better idea of exactly what is wrong and precisely what the **diagnosis** is.

In public health practice, you first take a community history and assess the current situation by doing a **situation analysis of your “patient” - the population you serve.**



**Figure 1: Patient and community diagnosis**

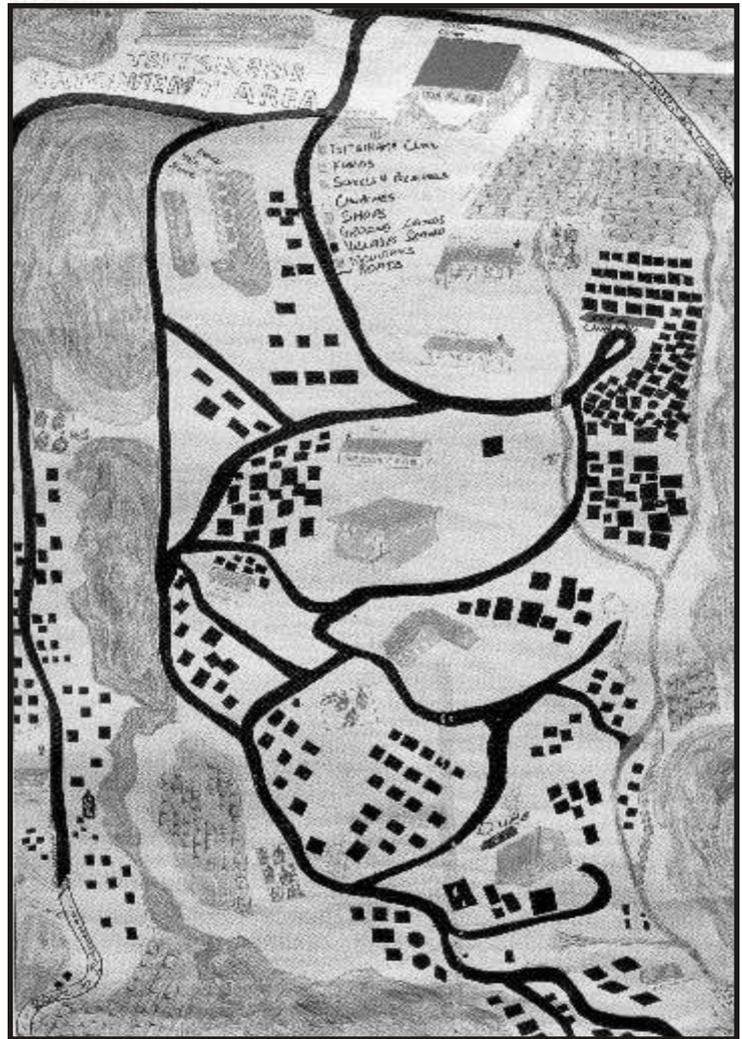
The first step is to define “who is your patient?” by determining the boundaries of your catchment area and identifying the population that lives there. Often exact data on the population is not available, or one community may use several health facilities, but it is important to make an estimate of the number of people for which each facility is responsible. This is your “patient”: the entire population you should be serving. That information is put on a **map** that shows boundaries, roads, rivers, places where people live, where health facilities, schools, churches and other community structures are (see “Mapping for Primary Health Care” by the EQUITY Project). This allows your facility and the community you serve to see at a glance where the health services are in relation to other services and where the people live.

It is also useful for you to get information on your patient’s socio-economic status, education, occupation, water and sanitation. These bits of information allow you to understand your patient’s environment and its influence on his health. To learn how to obtain this information see “How to do a Situation Analysis” by McCoy and Bamford of the Health Systems Trust (HST).

Once this “history” is known, you should examine the **records** of your health facility to find out *what* the main health problems are in the community, *who* has these problems, *where* these problems occur, *when* in the year they happen, and if possible *why* they occur. Unfortunately, in most facilities this information is not easily available and if available, is not in an easy form to use. This manual is mainly about how to set up and use the District Health Information System (DHIS) at your facility to garner routine health information in an easily available and user-friendly format. The information from the DHIS - collected, analysed and graphed monthly - provides a dynamic picture of the health status of your population and the services provided to them. It is the equivalent of the “medical record” of your “patient”.

Often there will be gaps in the information available and additional details will be needed, particularly with regard to what is really happening in the community. These “special tests” will sometimes merit the need for a special **survey** to obtain information not available from routine clinic records. These do not have to be highly sophisticated and scientific surveys. Often the most useful information is gained from “walk and talk” surveys of health workers walking around their communities and talking to the people who live there. This manual will not cover how to do these surveys, but it is expected that many readers will participate in the annual facility survey pioneered in the Eastern Cape, the anonymous survey of human immunodeficiency virus (HIV) amongst antenatal care mothers, (conducted annually in October in selected “sentinel” clinics), or special “coverage surveys” organised by district information officers to investigate immunisation or family planning use in the districts.

The **community diagnosis** is thus the identification of the priority problems in the catchment area using a combination of the situation analysis, the routine data available from the DHIS, and surveys conducted by the District Health Management Team (DHMT). The “treatment” is development and implementation of an **action plan** to overcome these problems at a local level. Unless there is adequate information, this action will be ineffective, as it will not be based on real and proven priorities.



**Figure 2: Catchment Map of the Tsitsikama Clinic**

# THE SCOPE OF THE DISTRICT HEALTH INFORMATION SYSTEM

The DHIS is a paper-based information system that uses a combination of forms, procedures and analytical tools to convert routine anonymous data (i.e. data that has no names attached) into useful management information that can be used by local program and facility managers. This manual assumes that the district is the first place where the data collected is entered into the computer, and all phases of the information cycle described here assume that the user does **not** have a computer. However, it is also assumed that the District Information Office is functional and will be providing facility level staff with monthly feedback on raw data and indicators. In order to get the maximum use of this manual, it is essential for you to know generally how the computer system can be used to improve information quality.

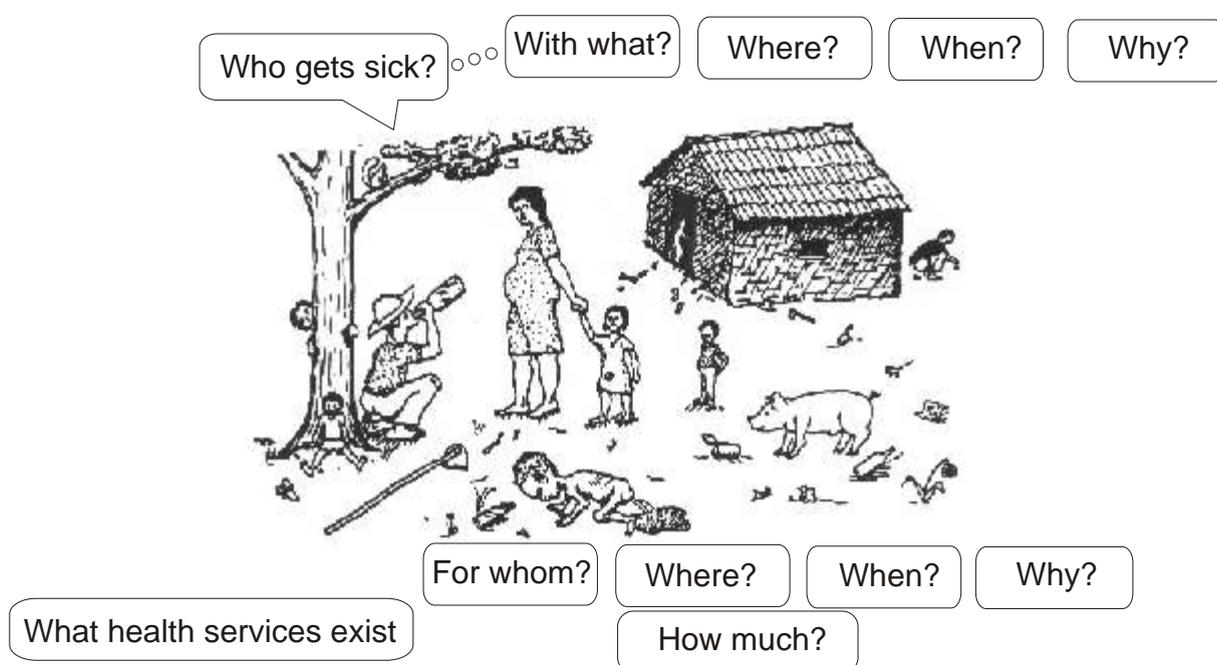


Figure 3: Who, what, where and why of ill health  
(From "Helping Health Workers Learn" by David Werner)

## THE HEALTH INFORMATION SYSTEM

The DHIS attempts to answer the six classical epidemiological questions *Who*, *What*, *When*, *Where*, *Why* and *How* about the health status of the people. This simple process of "epidemiological thinking" uses a set of indicators which relates the health service activities (**numerator**) to the population served (**denominator**).

### Who gets sick?

Information about who gets sick is collected on a set of data collection tools, client cards, registers, tally sheets and data input forms. The patient-held record (or in the more traditional institutions, the clinic record), provides the details of each individual, their complaints and what is

done for them. It will identify individuals for follow up at facility level, and is the legal record of that individual's interaction with the health care system. Presently, this information is kept with (or for) each patient and is not captured and sent to higher levels.

Health facilities need to maintain a record of services provided. The DHIS uses:

- **Tick registers** where there is a need for patient identification with services provided;
- **Tally sheets** where important conditions and services not needing follow-up are recorded with a mark and with no patient identification;
- **Program registers** for Expanded Program of Immunisation (EPI), antenatal care (ANC), family planning (FP), tuberculosis (TB), and chronics, where each patient is recorded on a line and continuity of service to each patient can be followed and tracked; and
- **Reports**, which contain the selection of these or “ticks” ( services provided), which are sent to the district each month.

The DHIS deals with aggregated, anonymous data; no individuals are identified in the reports. Age group and gender information are used where appropriate to ensure that specific target groups are given appropriate services.

The DHIS emphasizes the community aspects of health, looking wherever possible at the entire relevant population to determine what proportion or percentage of them have a priority condition or receive a given service. To do this, one uses rates, ratios and proportions to be able to compare different sized populations with each other. This manual shows you how these are calculated.

The other important aspect of the DHIS is the emphasis on the people **not** coming for follow-up of preventive services (immunisation, ANC), curative care (chronic conditions, TB, sexually transmitted infections (STIs) follow-up) and rehabilitation. The emphasis on reaching everyone in need of a service “coverage” is an important concept of PHC. Districts need to focus on **who** is **not** being reached and take measures to bring them into the system or reach out to them on a continuing basis.

## What conditions?

The DHIS concentrates on diagnoses of local public health importance that are identified in the situation analysis. The diseases tracked by the DHIS are all priority conditions on which local staff can take action, such as:

- communicable conditions such as TB, STIs, diarrhoea and lower respiratory infections;
- chronic diseases affecting the elderly (diabetes, hypertension, etc.) and mental health conditions;
- minor ailments collected only on tally sheets with no details to record overall workload.

The DHIS however does not just look at diseases. Emphasis is on:

- preventive activities such as FP, immunisation, and ANC;
- promotion of child nutrition using growth monitoring, birth spacing and vitamin A supplements;

- rehabilitation, developmental screening and early identification of important conditions like hypertension or asthma.

Because of the flexibility of the DHIS to include various data fields, the data to be collected can be adapted to the changing needs and interests of the staff at each facility. However, to ensure that the same basic information is available from all facilities, a national committee has determined the “essential data” that should be collected by everyone delivering PHC services.

The **Information Pyramid** is a schematic way of looking at the number of data items to be collected at each level of the health system, allowing each level to gather data of importance and relevance to their daily work while avoiding excessive data where no action is taken.

In this model the community is the foundation: it is where all information originates and where most health service action takes place. Most data collected in the community and at health facilities is of an operational nature and is not needed at district level. Therefore, “filters” are put in place in the form of reports which send only the “essential data sets” to the next level. Each of these data sets contains only the essential data of the next level, which get smaller and smaller as one gets further from patients and the community.

The level closest to the people served must collect **all** needed data, but it uses information on its **inputs** (days used, staff attendances) for its own local management. Districts tend to monitor the **process** of service delivery at their facilities, while provinces are generally more concerned

about **outputs** (coverage of various services). National looks more at **outcomes** of combined services while the World Health Organization (WHO) monitors overall **impact**. These are general descriptions of the type of information most useful at each level but are not exclusive to these levels.

Data from districts is processed, filtered and streamlined before being sent to the province, and a similar filtering process happens at provincial and national level, before being sent to the international level. By getting general agreement around this filter process, each level is aware of the needs of the next level and will collect and report the essential information they require.

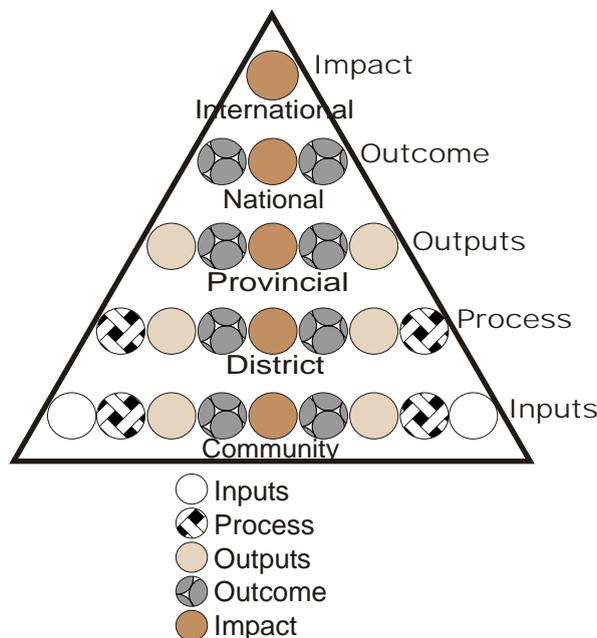


Figure 4: Information Pyramid

## Where do clients come from?

The DHIS is based upon facility information so that all information can be related to the geographical catchment area of the facility and the people who live there. In addition, the facility register has more detailed information about whether clients come from within the catchment area or from outside.

This information, plus local knowledge and personal observation, allows you to put health data onto hand-drawn maps that illustrate the health of your population. The computer can be used to prepare larger scale maps of entire districts or provinces using a Geographical Information System (GIS). Many illnesses, such as cholera or typhoid, start in a local area and spread from there. Early action based on knowledge of **where** clients are found can be a powerful tool to control outbreaks of disease.

## When do people get sick?

The monthly DHIS data allows facility staff to graph conditions and use of services over time and to compare numbers of cases in different months of the year. This prepares you to order appropriate medicines and equipment for the time of year and to take appropriate preventive actions.



Figure 5: This map shows the catchment area of the Nomonde Clinic in the Queenstown District

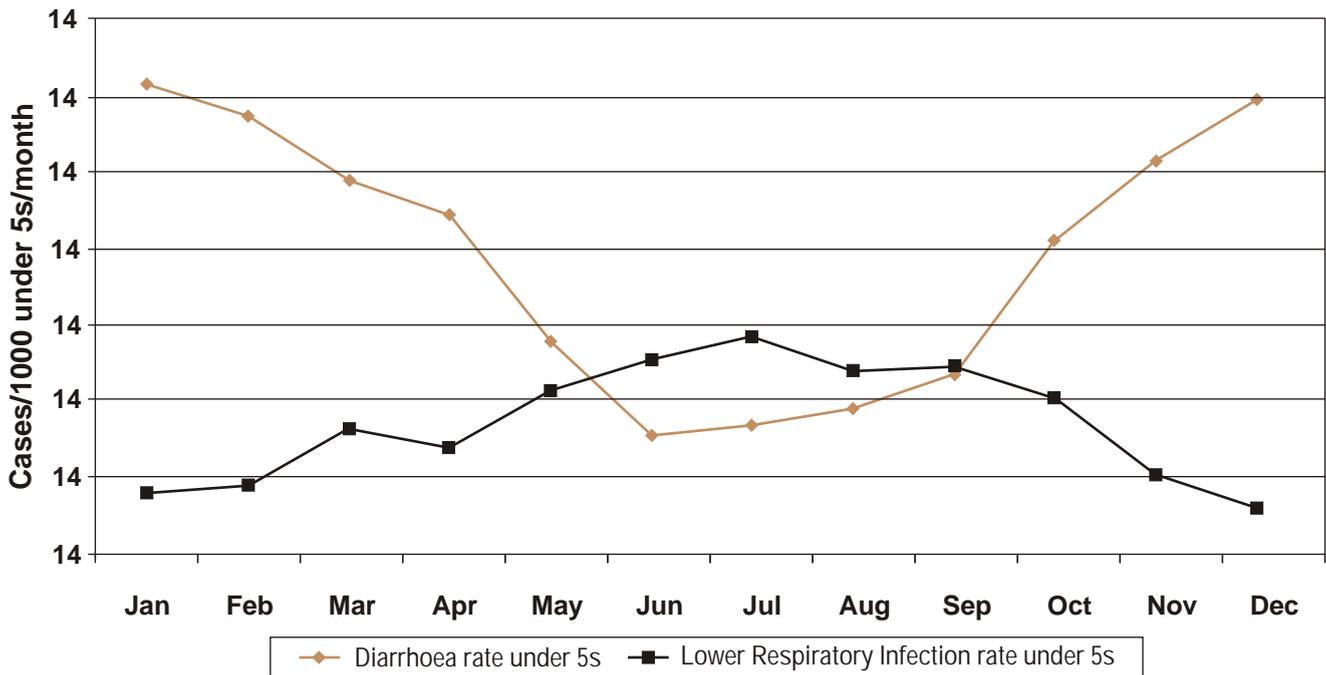


Figure 6: Seasonality of diarrhoea and pneumonia in children under five

## Why do they get sick?

Most people get sick because of underlying social or economic conditions; water, sanitation, diet, housing, education, and habits like smoking or sexual practise have more direct influence over health than health services. These underlying causes are almost impossible to determine from routine health data, but the DHIS provides information to enable research to be focused on the most important conditions within a given population and to conduct special inquiry into the causes (environment, poverty, behaviours, etc). A special module on environmental health to guide environmental health officers (EHOs), will help link ill health and disease outbreaks to the environmental situation underlying them. In this way, the DHIS supports the development of health systems research capacity in each district.

## How do we overcome the problems?

Analysis of the DHIS identifies the common problems, the age groups that are affected and the places they occur. This gives facility health managers the knowledge to plan, implement and evaluate activities to overcome such problems. It shows where facilities are doing a good job preventing illness and also illustrates which facilities are **not** performing and will need additional support.

This comparison of individual facilities at district level allows weaker facilities to learn from stronger facilities and has been shown to be a vital way of improving health services. Similarly, facility managers can look at individual programs to identify those that are meeting targets and help them to support others that are not performing well.

# THE MANAGEMENT INFORMATION SYSTEM

The DHIS compiles answers to a set of questions shown in Figure 3 (page 5): *What* services exist? For *whom* are services provided? *Where* are the services? *When* are services provided? *How* much do they cost?

The DHIS should provide managers information about quality of service provision, drugs, staff workload, and costs of services provided. As management responsibility is decentralised to facilities, this component will need further strengthening to include client satisfaction and measures of efficiency.

## What services exist?

The DHIS provides information about the full spectrum of PHC services offered at clinic, community health centre and hospital levels.

In the infrastructural module of the DHIS computer program, which captures basic information about each facility as well as the results of the annual audit of clinics, there is a wealth of information about health infrastructure. This includes data on the state of the facility building, quality of communications, staff numbers and strength, skills and training as well as all equipment, frequency of services provided and measures of quality of care. Each facility must keep their basic information up-to-date to assure the facility is properly characterised and resourced.

An analysis of the routine monthly reports allows an assessment of the quality of and balance between:

- **Curative** services such as communicable, chronic, mental diseases, and minor ailments
- **Preventive** health services such as antenatal care, immunisation, FP
- **Promotive** services such as growth monitoring, health education, STI contact tracing
- **Rehabilitative** services such as food supplies for severe malnutrition or disability care

## For whom are these services provided?

This is a question that has traditionally not been answered by the South African information systems, which look only at the clients coming to the facilities. Many DHIS indicators look at service utilization and the coverage of the community served and thereby identify the locations from where the people have **not** come to get services. These are the real challenges of public health and the PHC approach - to reach out to those people and serve them too.

## Where are the services?

The **catchment area map**, which is an integral part of the DHIS, should show all services provided by each facility, including outreach points, satellite clinics, mobiles, non-governmental organisations (NGOs), community-based organisations (CBOs), community health workers (CHWs), traditional birth attendants and traditional healers.

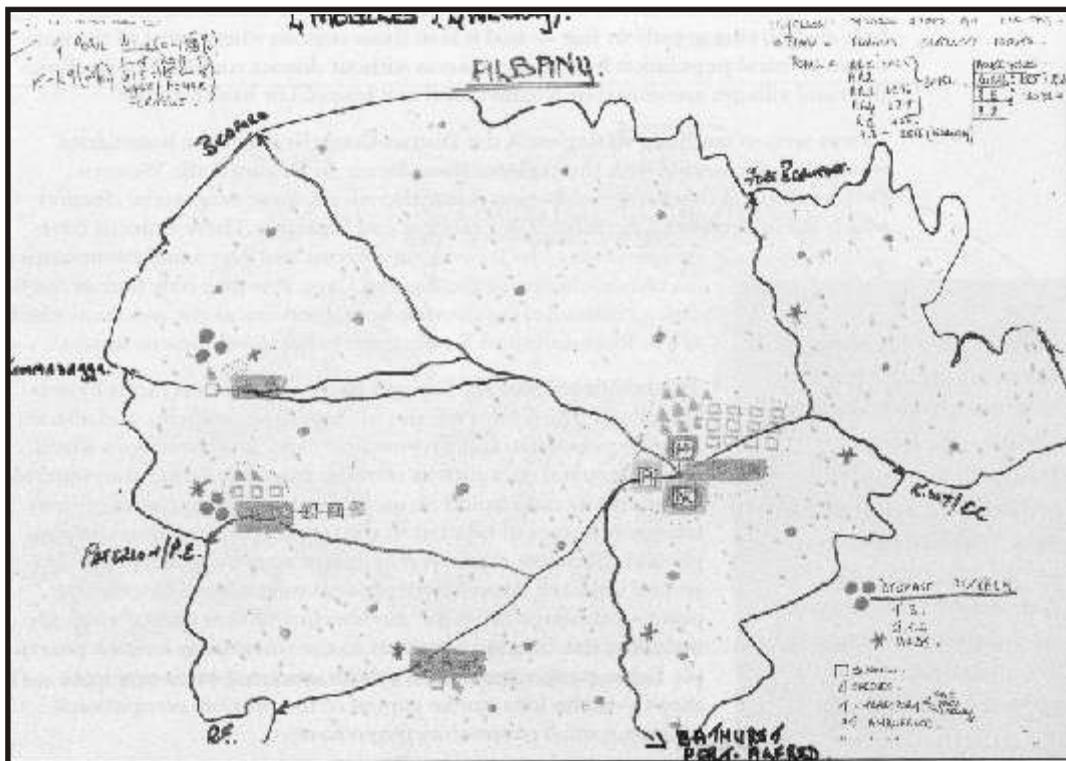


Figure 7: Routes of the Western District Council mobile clinic

A **district map** will show the distances between each facility, roads and communication systems, as well as populations not adequately served.

At the provincial level, many provinces are developing a GIS which enables health workers to use the DHIS to plot maps depicting electronically the service coverage (e.g. immunisation, ANC, FP) in different (sub) districts, where specific diseases (e.g. malaria, measles, cholera) are occurring, and where services are provided in relation to populations.

## When are services provided?

Most clinics are busy in the morning and quiet in the afternoons. With minimal effort, the tick register or tally sheet can be adapted to convincingly show facility managers and health workers when patients are coming. This allows facility managers to adjust staff schedules and to develop booking systems that encourage chronic patients or others who may benefit from a less pressured time to come at times that are less busy such as afternoons or special days. This is entirely consistent with the PHC policy and improved quality of care while reducing waiting times, in line with “*Batho Pele*”. It is up to each clinic to adjust its schedule accordingly to distribute workload and services throughout the day.

## How much do they cost?

To date, the DHIS has not dealt with financial data, as not much financial management has taken place at facility level. However, this is changing as local authorities take over PHC services. In the near future, annual staff and drug costs will be assessed routinely and financial management

indicators such as cost per client will be readily calculated for all facilities. As the major expenditure is for personnel (80-90%) and drugs/supplies (5-10%), these can easily be calculated from total annual figures and costs can be estimated and tracked. Combined with the service level statistics from DHIS, this enables calculation of cost per client served or cost per service provided. The current indicator of “nurse workload”, expressed as clients seen per nurse working day, is an easy way to track costs :

- take an average nurse salary/month,
- divide it by 20 working days/month,
- divide that by “nurse workload” and
- divide by 0.8 to get a good estimate of cost per client served.

average nurse salary/month ÷ 20 working days/month ÷ nurse workload ÷ 0.8

For further details, refer to the HST’s District Health Expenditure Review (DHER) manual.

## DISTRICT HEALTH INFORMATION SYSTEM: VISION AND PRINCIPLES

The DHIS is an information system developed in South Africa by a collaborative university-based project known as the Health Information System Project (HISP) to support management at district level. HISP started the DHIS in 1994 in three districts in the Cape Metropole. It has since developed considerably through wide-scale implementation in the Western Cape (1998) followed by the Eastern Cape supported by the United States Agency for International Development (USAID)/South Africa and implemented by Management Sciences for Health (MSH) through the EQUITY Project (1999). In 1999, it was accepted as the national system for PHC by the National Health Information System of South Africa (NHISA). Since 2001, with the help of USAID/South Africa and the EQUITY Project, it is being implemented throughout the country. Certain provinces in Mozambique, Malawi and India have also started using the DHIS.

The DHIS vision is:

To support the development of an excellent and sustainable health information system that enables all health workers to use their own information to improve coverage and quality of health care within our communities.

The DHIS has a number of basic principles:

1. Supports the district-based PHC approach.
2. Collects essential data used to calculate indicators.
3. Encourages decentralised use of information by health workers.
4. Includes all service providers at all levels.
5. Integrated with and supports other information systems.

## 1. Supports the district- based PHC approach

The South African Department of Health (DOH) has chosen PHC as its fundamental health care approach. In a comprehensive and integrated way, all facilities are expected to provide services to their defined population for all elements of PHC. The array of services provided in PHC is described in a document prepared by the DOH. The district health system implements this approach by giving real authority to managers at district and facility level and strengthening management at all levels.

The DHIS is dedicated to supporting PHC in districts by providing a set of tools that encourage the use of information for decentralised management of health services. Services are monitored through a coherent information system that enables managers to use limited resources in the best manner possible.

## 2. Collects essential data based on indicators

DHIS collects only the **must know** information needed by the health facilities to monitor and evaluate local priority PHC programs. This **Essential Data Set** needs to be reviewed regularly to ensure that it is relevant to the needs of all health workers. Information that is not useful to local management decisions should not be collected.

The DHIS concentrates on the information that one **must** know. For example, for immunisation there is only **one** must-know indicator: the percentage of children under one year who are fully immunised. However, there is a lot of other information which can be collected:

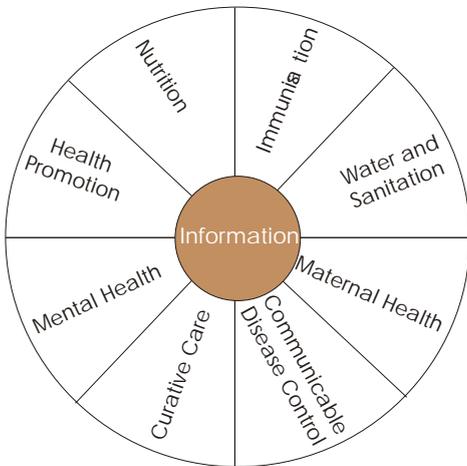
<b>Must know</b>	% children under one-year fully immunised
<b>Useful to know</b>	Drop out rate DPT 1-3; measles coverage
<b>Nice to know</b>	Other program vaccines given
<b>Dangerous to know</b>	All doses given over 1 year; vaccine wastage rate; DPT2, polio 2; non-program vaccines (MMR, flu, etc).



**Dangerous** information is so called because it distracts health workers from the essential work of seeing patients and diverts attention to data that is of no use in making decisions. In this way, the essential data set was initially reduced to only 26 data items in the Eastern Cape. It has since grown to nearly 50 items as managers identify more useful indicators to help measure quality of service.

The DHIS provides user-friendly and locally relevant data collection tools registers, tally sheets and data entry forms that are easily generated by the DHIS software at district level. These tools can be individualised for each facility to reflect only the services provided, and you should insist that any services that your facility does **not** provide are not appearing on the monthly report form.

### Information for PHC



Data quality is also assured by a number of built-in computer tools and techniques designed to check the reliability and accuracy of data. You should ensure that your district office tells you about any mistakes found in the data you submit to prevent the problems re-occurring in the future.

### 3. Encourages decentralised planning and management

A manager that displays data on graphs and uses information to plan and evaluate makes better decisions. The DHIS is designed to encourage all health workers and local managers to use the information collected at facilities to monitor progress towards the targets they themselves have set. This is shown graphically in the planning cycle, which portrays a number of questions that are answered by information.

### 4. Includes all service providers and at all levels

As can be seen in the diagram of the HISP model, the team of people providing and using information includes service providers from all health care facilities, whether they are from local government, private or provincial facilities, “vertical” programs, mobiles, clinics, health centres or hospitals.

An important component is the community and its various health-related organisations, who all need to be included in the collection and use of information for the DHIS. Private practitioners (including traditional healers) are another group of service providers who are often neglected by the DHIS. Information - its proper collection, timely analysis and regular display and use - is the “brain” of a district health system (DHS).

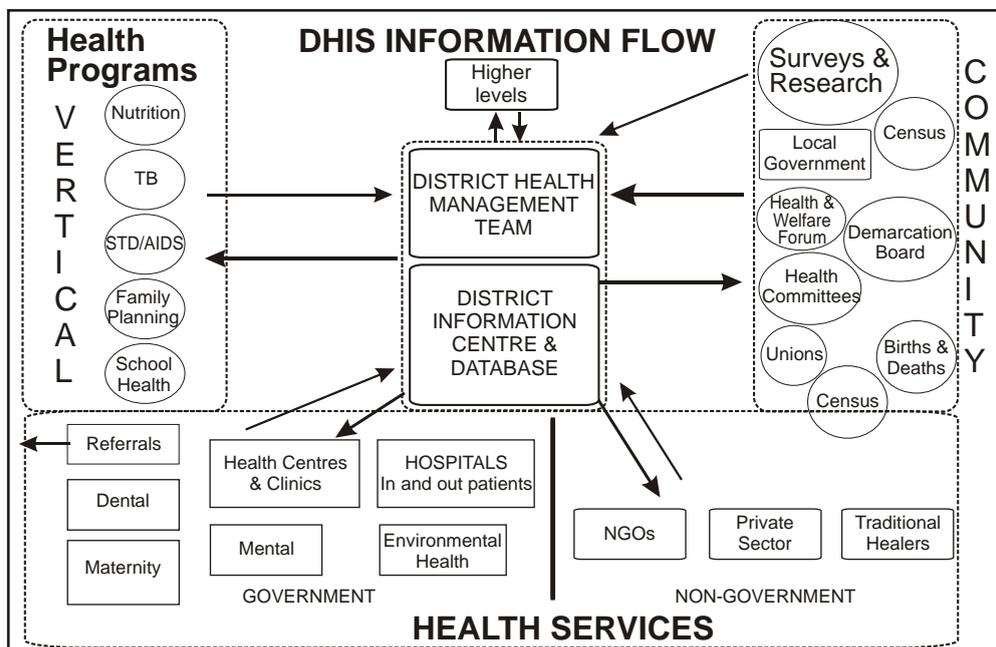


Figure 8: The DHIS flow diagram

## 5. Integrated with other information systems

The DHIS currently concentrates on PHC services and district hospitals, but aims to provide an integrated picture of all health-related activities in the district. As such, it will support all other district level information systems such as notifiable diseases, births and deaths, transport, environmental health, laboratory services, hospital information, and others. The DHIS is designed to feed into all other levels of the health and social services system and will provide regional, provincial and national information systems with the specific information they need. It is designed to facilitate the capture and use of essential data at each facility to improve the quality of health services provided there.

The DHIS is paper-based at facility level and computerised at district level and above. This computerisation is designed to link up with other computerised systems such as vital registration (births and deaths), laboratories, transport, pharmacy (Medical Supplies Administration System (MEDSAS)), financial (FMS, BAS) and personnel (PERSAL) systems. In this way, district management will have an easily-accessible database of all health-related activities in the district.

## THE PLANNING CYCLE

The “planning cycle” is a recurring process of measurement, analysis and action designed to improve management; it is also sometimes called the “triple-A” cycle: Assessment, Analysis and Action. In this planning cycle, information is at the centre of the process and analysis of information provides answers to the four fundamental planning questions:

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



**Figure 9: The planning cycle**

“If we don't know where we are going, how will we know when we have arrived there?”

Alice in Wonderland

This planning cycle is one of the fundamental elements of the DHIS and its components will be described in detail throughout the manual. At the centre of the cycle and answering all these questions lies the routine information provided by the DHIS at facility level, analysed and interpreted by local staff and presented in a usable form for staff and community to use in improving services.

Traditionally in South Africa, this planning cycle has been done at “higher” levels - provincial and national - but with the introduction of the DHS, these

functions are increasingly being done at local level by mid-level managers such as you, the reader of this manual. A number of analyses and display tools are provided in the form of tables, graphs (line, bar and cumulative coverage) and reports. The purpose is to make data and information “visible” and meaningful to all workers. In addition, workers are encouraged to use every available opportunity to discuss information at meetings, during supervision and in in-service training.

# Planning tools

In order to assess achievements at the facility, you need to compare *what* you have done to what you planned to do. In other words, you have to see if you have achieved the targets you have set. Planning requires a clear understanding of *what* it is you are trying to accomplish and then determining at each level, *how* you will accomplish that. There is a hierarchy of these questions as shown in the diagram below.

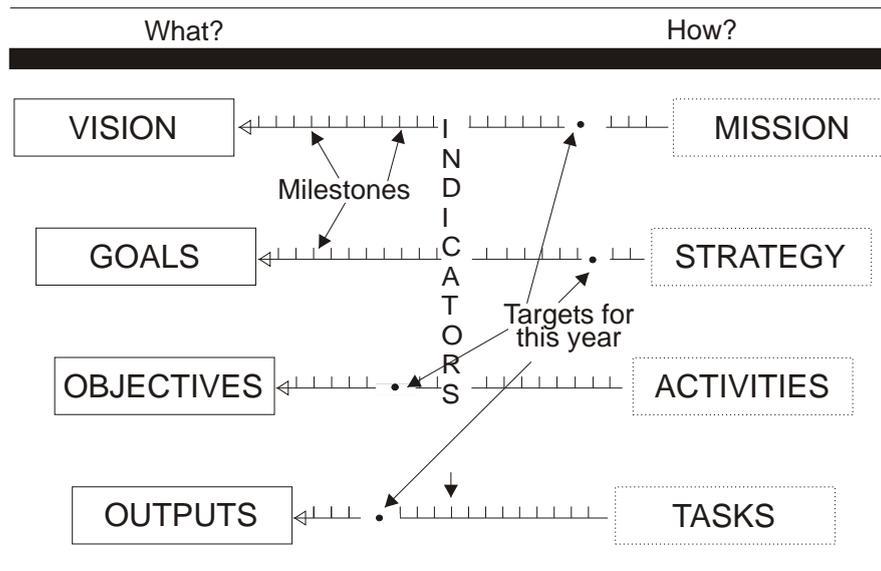


Figure 10: Hierarchy of questions to assess progress

On the left of Figure 10 are the *WHAT* questions starting with the largest and broadest dream, or **vision**. This is broken into specific **goals** that comprise that vision. Each goal is then defined by a number of **objectives** that must be accomplished to reach each goal. Generally, to achieve objectives, certain **outputs** from your efforts will be needed.

On the right side are the *HOW* questions described as your **mission**, which states in general terms how you will achieve your **vision**. Your **strategy** describes how you will approach the **goals**. The **activities** you choose are designed to reach your **objectives** and the **tasks** that comprise each activity result in **outputs**.

The link between the *how* and the *what* in all cases is an **indicator**, which is a measurement of your progress towards reaching the *what*. Indicators need to be carefully determined to enable accurate and regular measuring therefore, monitoring your progress towards accomplishing the *what*.

The time taken to achieve these accomplishments varies from **vision**, is an “ideal” in the indefinite future, to **outputs**, each of which can be achieved in your daily work.

**Milestones** are set along the way to measure progress and are fixed, like the milestones at the side of the road. We use them to measure **targets**.

**Targets** are set when we attempt to reach a certain value of a given indicator or **milestones** in a fixed period. Often we set operational **targets** for each year or an even shorter time span to measure our progress, but once a **target** is reached, we will usually set a more ambitious **target** and continue in our attempts to reach the *what*. **Targets** are therefore moveable, according to our capacity to implement them.

## Vision and mission

The **vision** is the largest and broadest dream. It is the way in which top politicians and management see things happening in an ideal world, the classic being “Health for all by the year 2000”.

The **vision of the South African DOH** is:

A caring and humane society in which all South Africans have access to affordable, good quality health care.

This is a fine sentiment, but obviously not achievable in the near future. As managers, you need to break it down into more practical goals and objectives.

The **mission** is a statement of how this will be achieved, also in very general terms.

The **mission of the South African DOH** is:

To consolidate and build on the achievements of the past five years in improving access to health care for all and reducing inequity and to focus on working in partnership with other stakeholders to improve the quality of care of all levels of the health system especially preventive and promotive health, and to improve the efficiency of the health care delivery system.

## Goals and strategies

**Goals** are broad aims stated in general terms that represent the future direction in which political decision-makers and senior health care managers feel a program should be developing. Each program or service area should have their **goals** clearly stated.

Examples of goals include the “10 Point Plan of the South African Health Sector Strategic Framework 1999-2004”:

- Reorganisation of certain support services
- Legislative reform
- Improving quality of care
- Revitalisation of hospital services
- Speeding up delivery of an essential package of health services through the district health system
- Decreasing morbidity and mortality rates through strategic interventions
- Improving resource mobilisation and management, without neglecting equity
- Improving human resource development and management

- Improving consultation and communication within the health system and with communities
- Strengthening cooperation with international partners

Again, these are not very implementable in your daily work as health managers, but they are at least recognisable as measurable goals that you can aim for and develop broad strategies and plans to achieve them.

**Strategies** describe how you are going to achieve these **goals**.

National strategies are:

- Strengthen partnerships with communities, stakeholders, the private sector, NGOs and CBOs
- Build an accountable health sector geared towards improving the standard of health care delivery to ensure a healthier nation, rallying under the banner of “*Batho Pele*”

At a local level these strategies may be detailed even further. Strategies for the quality of care goal and essential drugs might include:

- Strengthening of the central district medical stores procurement
- Improvement of the distribution of drugs to district facilities
- Use of stock control cards at each facility
- Training of staff to order appropriate quantities and types of drugs

## Objectives and activities

These strategies aim to accomplish specific **objectives** which can be measured and to which people can be held accountable. The objectives from the Essential Drugs Program may be:

- Competitive bids will provide quality drugs at lowest cost
- Tenders will be sent out to all suppliers
- All stock cards will be up-to-date
- Stock outs will be less than 5%

**Activities** are planned to accomplish objectives and comprise part of a district or facility work plan:

- Stock cards and instructions printed and distributed to all facilities
- Staff trained in stock card use
- Drugs delivery contracted to courier service

## Outputs and tasks

Finally, activities are broken into daily **tasks** to get the job done, which result in **outputs** that add up to achieving the **objectives** that have been set:

- Stock cards designed
- Printing tenders advertised
- Stock cards purchased
- Stock cards delivered to depots
- Adequate cards distributed to each facility
- Manual for stock control designed
- Training in stock card use planned
- Staff trained in each facility

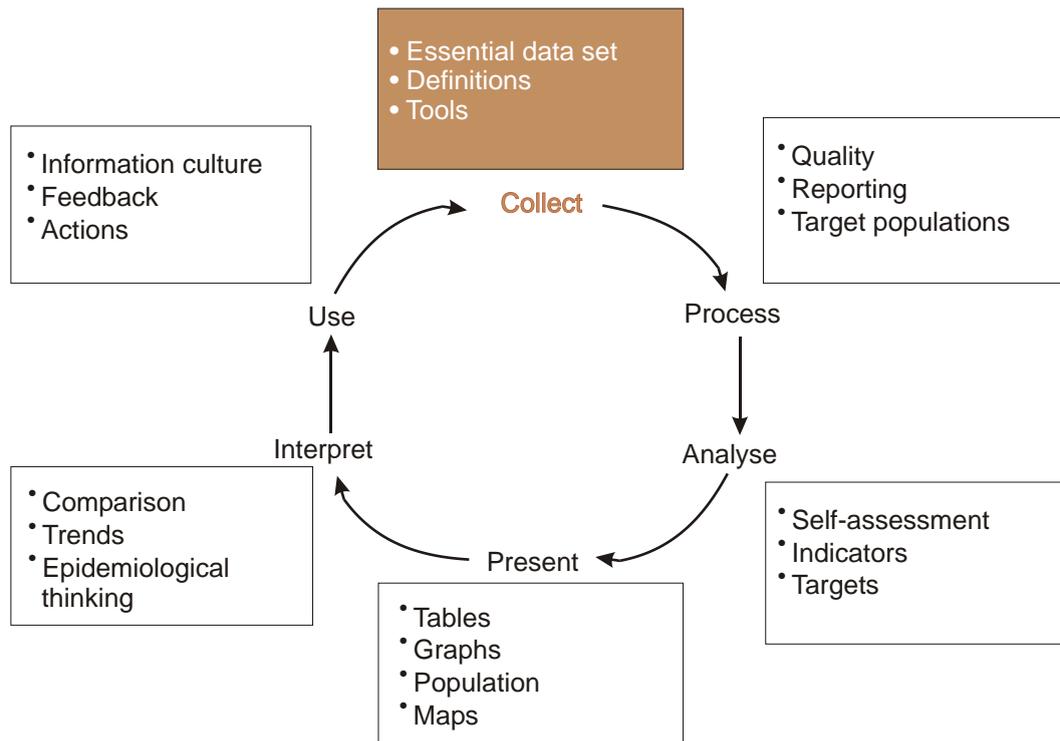
A detailed **plan** provides the daily guide to tasks that achieve **outputs**, which added together accomplish **objectives**, to eventually meet the **goals** and fulfill the **vision**. The DHIS is designed to measure all elements of this cycle.

# Chapter 2

## The Information Cycle: Collecting Data

The Information Cycle is a diagrammatic way of looking at information and enables you to see the links between the different phases of collecting, processing, analysing, presenting, interpreting and using information. Each of these phases has a number of sub-phases that give more practical details of how to implement the cycle. Chapters 2 to 7 describe this cycle.

### The Information Cycle



## ESSENTIAL DATASET FOR A HEALTH FACILITY

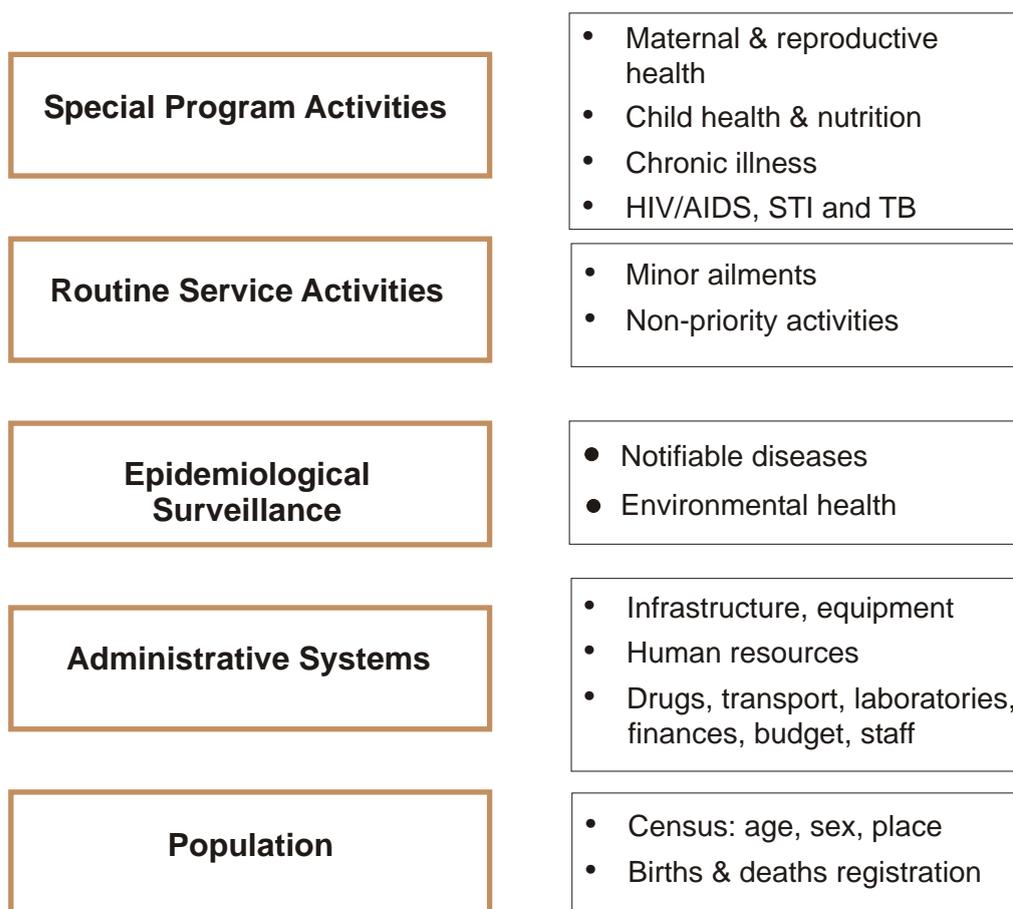
All data collected must have a purpose, and the purpose of data at facility level is to be used to calculate indicators that measure how well the various programs are performing.

At facility level, there are two main types of data collected routinely:

- Activity data about patients seen and programs run, routine services and epidemiological surveillance;
- Semi-permanent data about the population served, the facility itself and the staff that run it.

In Figure 11 (see page 22) the various sub-systems of the health information system at a facility are shown diagrammatically. Activity data is collected about special programs, routine services, and epidemiological events. Semi-permanent data comprises population and administration, which change more slowly.

Each of these sub-systems of the facility information system will now be discussed in detail.



**Figure 11: Information collected at PHC facilities**

## Special programs

Special programs are the programs selected by national, provincial and district level as priority programs to get special attention by all health workers. These special programs all have carefully defined indicators that are measured at all levels of the health system and are included in the reports of all facilities nation-wide. Usually one or two well chosen indicators are sufficient to measure the overall progress of a program area. Too many indicators divert attention from the most important elements, often harm data quality and confuse workers trying to identify priority actions to take. Some programs identified by the 10 Point Plan, with their key indicators, are shown on the next page and all are explained in detail in Appendix A. Special program data is the key to understanding the performance of a health facility because if these priority functions are well done, the main needs of the population are probably being served. Many of these programs need continual follow-up and support of clients. Continuity of care is a test of the good management of a facility.

These special programs should be the centre of effort around which all other activities are focused. Collection of accurate and timely information about them should be the major concern of facility heads and supervisors, and managers performance assessment should be based upon this information.

Program	Indicator	See page
Nutrition	Failure to gain weight rate	98
The Expanded Program on Immunisation (EPI)	% children < 1 year fully immunised	101
Maternal Health	Antenatal and delivery coverage	105
Reproductive Health	Couple year protection rate	110
Sexually Transmitted Infections	Male urethral discharge incidence, contact tracing rate	112
Chronic Diseases	Hypertension treatment prevalence	114
Tuberculosis	Cure rate for new smear positive cases, interruption rate	119

Figure 12: Indicators for special programs

## Routine service data

Routine service data records activities that do not form part of the special programs or disease surveillance. This data is “nice to know” to calculate workload and to identify non-priority diseases such as minor ailments (coughs, colds, simple skin and eye conditions, etc) and to make sure that there are appropriate drugs for common conditions. This data is not of major public health significance and it is not used to calculate disease indicators so is often not reported to the district. It should be collected on tally sheets (see Figure 22 on page 38), as there is usually no need to record names and address for follow-up. Analysis of these conditions may be made annually, when it is nice to get a picture of the overall disease spectrum at the facility.

## Epidemiological surveillance

Epidemiological surveillance data is data collected about notifiable diseases, certain environmental conditions and risk factors that need immediate and rapid action to prevent potential outbreaks or epidemics. Surveillance should be done by all facilities, but is done intensively by some facilities known as sentinel sites, which make special efforts to detect diseases of epidemiologic importance.

### Notifiable diseases

Notifiable diseases are those conditions of public health significance that must be reported to health authorities. The current South African list is long and largely comprises diseases never or rarely seen in the country (ask yourself: when last did you see a case of onchocerciasis, brucellosis or anthrax?), with the notable exception of TB, which accounts for well over 95% of all notifications. Diagnosis of most of these communicable diseases requires sophisticated laboratory confirmation, and even experienced clinicians are not practised in their recognition. Thus, notifiable diseases data is unreliable in South Africa and indeed in most of the developing world. This is mainly because health staff are not aware of the importance of notifiable diseases and see them as a problem for “other people”, such as Environmental Health Officers, to deal

with. As with other information systems, inclusion of too many data elements compromises the quality of all the data. A much reduced list is being planned for release soon by NHISSA and it is likely that TB data will be reported only through the routine information system. These new criteria and forms will be provided to all clinics and all staff should be alerted to the importance of rapid recognition and reporting. Only through universal awareness and quick action can epidemic conditions be contained. This is a vital responsibility of each health worker at every level of the system.

## Different diseases require different actions

Epidemic diseases such as cholera or haemorrhagic fever: Even the suspicion of one new case is enough to provoke immediate action and all the alarm bells should go off. Reporting must be immediate, by telephone or in person.

Endemic diseases such as measles, rabies, and plague: These are continually present but may increase if control mechanisms such as immunisation or vector control are not effective. These are usually reported weekly.

Null reports are used to assess the control of diseases such as polio, which are close to eradication. In order to verify that all cases of polio are detected, all cases of Acute Flaccid Paralysis (AFP) should be reported, even though we know that they are not polio. If no cases of AFP are reported we are not looking hard enough for cases of polio. Null reports indicate that we are looking but no cases have been found. If we detect the expected number of AFP (1 case per 100,000 population aged <15 years), it suggests that we are looking hard enough and suggests that all cases of polio have been detected.

## Rapid response system in Mpumalanga

Mpumalanga Province has come up with an innovative way of improving notifiable diseases collection and reporting. They have identified nine “syndromes” which require rapid response and have developed and distributed a special form that needs to be filled in weekly, whether or not these cases have been seen.

Details of this system are available in a manual on the web. ([www.jcu.edu.au/school/phtm/PHTM/salinks/outbreak.htm](http://www.jcu.edu.au/school/phtm/PHTM/salinks/outbreak.htm))

### Rapid Response Diseases, Mpumalanga

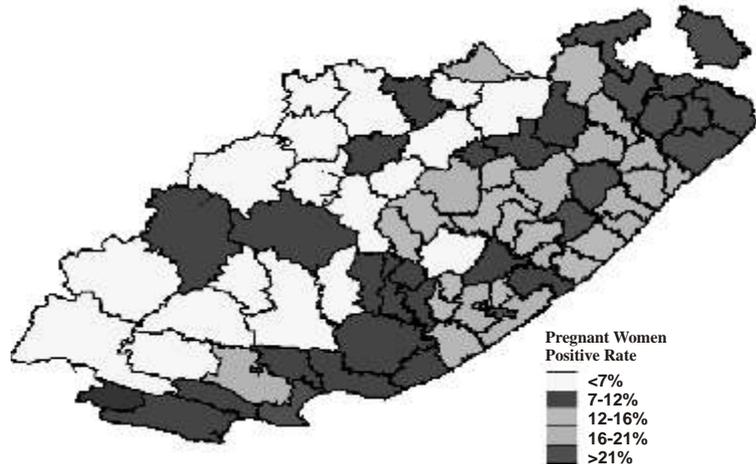
1. Acute Flaccid Paralysis
2. Meningococcal Meningitis
3. Dysentery
4. Measles
5. Plague
6. Haemorrhagic diseases
7. Yellow fever
8. Cholera
9. Unidentified fever

These syndromes are all clearly described in a training manual, together with the appropriate responses to take in case of an outbreak. In addition, the Province provides regular and immediate feedback to all notifying institutions to inform them of the notifiable disease situation in the province.

## HIV/AIDS sentinel sites

Another method of epidemiological surveillance is to identify a number of surveillance sites where non-routine data is collected specially. These sentinel sites give a representative picture for the rest of the country. Each province, for instance, has a number of HIV sentinel sites where blood testing is more frequent, antenatal surveys are done each October, and research is carried out that will inform planners and policy makers of trends in the HIV epidemic.

In the Eastern Cape Province, 40 clinics from all parts of the Province providing ANC services have been selected to conduct an annual survey for HIV. Blood samples are taken from all ANC clients and are not labelled with names, making the results entirely anonymous. This enables an accurate estimate of HIV prevalence among pregnant women,



Source : ECDOH

Figure 13: Estimated HIV prevalence among ANC women, by magisterial district - 2000

and from that, estimates of HIV in the rest of the population. The Province plans to expand the structure at these 40 sites to answer questions on prevalence of other important conditions: hypertension, nutritional status, micronutrient deficiency, etc. The findings of sentinel sites can establish good estimates for the whole province.

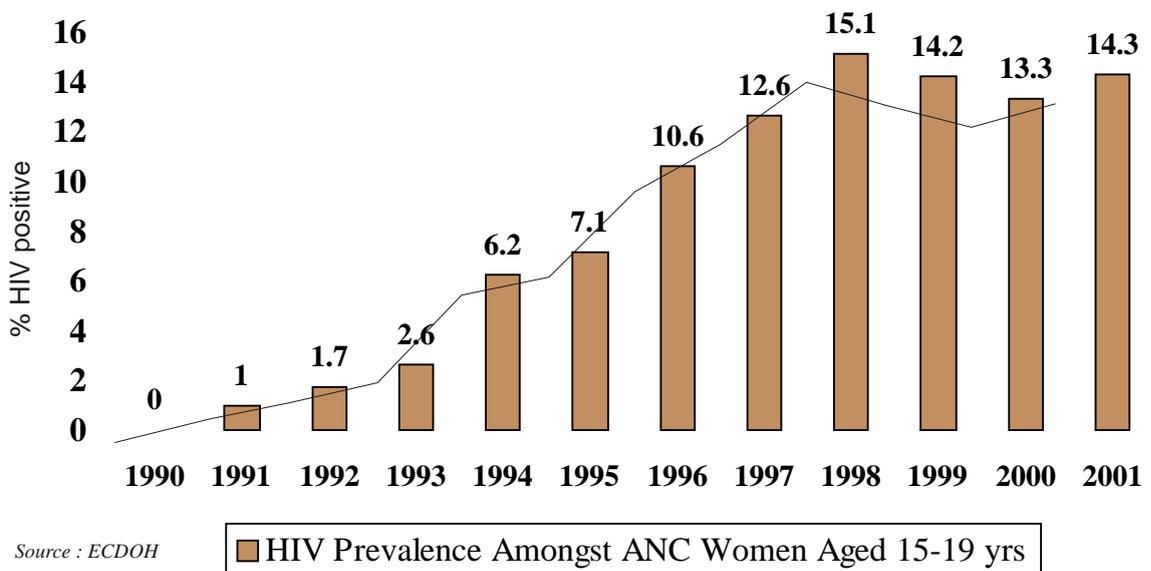


Figure 14: HIV prevalence amongst women aged 15-19 years attending ANC in the Eastern Cape Province

## Administrative data

Accurate administrative data is crucial to good management. An enormous amount of administrative data is collected daily by all health facilities: staff attendance registers, stock cards for drugs and supplies, laboratory specimens sent, and in some cases, cash and expenditure records. Most of this administrative data must stay at the facility because it is there that it is actually used. To be useful for management, administrative data must be kept to a minimum “must know”. Only data that is used for decision-making at other levels needs to be reported upward. Presently, number of nurse working days, and out of stock indicator drugs along with headcounts and numbers of patients referred are the only such data that are collected and sent upwards monthly by the DHIS. Other data may be recorded locally, but only if it is used.

## Organisational unit infrastructure and equipment

Organisational unit data is semi-permanent data about the facility that does not change much from year to year and enables managers to know exactly what resources are available at each facility. This data concerns the state of the facility, the staff working there, the amount and condition of the equipment and the general infrastructure. This data was originally collected on Regional Health Management Information System (ReHMIS), but this data is now out of date and various methods are being used to update and simplify it.

In the Eastern Cape Province, organisational unit data is normally collected once a year at the annual facility survey, when the data on the DHIS computer is fed back to health facility staff for updating and verification. Other provinces collect the data on a routine basis and update it along with other monthly information, while still others are using specific inventory systems. However it is collected, it is essential that each facility is aware of the state of its infrastructure, the “essential” equipment list and staff needs, and informs the district regularly of any changes to facilitate planning if any new resources are made available.

This infrastructural data consists of at least the following:

- Geographical position latitude and longitude (this should not change!), address, telephone and fax number, name of supervisor and nurse in charge;
- Staff establishment and actual posts filled, skills and training of each worker and details of people in charge;
- Services provided, including PHC, community outreach, obstetric services, specialist services, medical doctor days, useable beds, etc.;
- Infrastructure, such as number of rooms, water, electricity, telephone, staff housing and security and emergency services;
- Essential medical equipment available, such as diagnostic, obstetric and emergency.

This data is currently collected only in the Eastern Cape Province, but will be introduced in other provinces in the near future.

## Human resources data

Human resources are the most valuable (and most expensive) component of health services. Human resource management is a neglected component of most information systems, but deserves more attention since its personnel consumes 80% or more of the financial resources at health facilities.

All managers should know how many days staff work and, when not present, for what reasons. They need to know how many of what grade of staff they have, their training level and special skills or aptitudes. A training needs assessment should be carried out and form the basis of a facility training plan. All training needs to be documented and evaluated. Human resources data is centralised in the district computer where data from the national system PERSAL is downloaded onto the DHIS, and can therefore be analysed and updated. Printouts of the relevant data should be available in each facility.

Key indicators of human resources include :

- Staff/population ratios
- Staff workload
- Absenteeism rates
- Proportion of key staff establishments that have been appointed
- Proportion of staff who have had appropriate training for priority programs

## Logistical data

Data about logistics and backup support in the form of transport, drugs, laboratory and X-ray services needs to be collected carefully by facilities, as they are dependent upon these support systems to function effectively.

### Transport

Transport management throughout the country is being managed by a simple yet effective system developed by TransAid. Details of data to be collected for each vehicle and indicators to be calculated are described in the "Transport managers' handbook". This system is being computerized and the computer program is fully compatible with the DHIS and distributed with the DHIS software. Monthly, six key indicators for each vehicle are calculated:

- Fuel efficiency: kilometres per litre
- Maintenance/repair costs
- Days out of use for repairs
- Trips by purpose (administration, patients, supervision, drugs, etc.)
- Total cost per kilometre travelled
- Requests declined

This system should be managed at the district office with relevant reports sent down to supervisors, facilities and other users of transport.

## Drugs

Drugs are the biggest budget item over which facility managers have direct control. Control has to be exercised over their timely ordering and allocation through the use of stock cards. The “Managing Drug Supply for Health Institutions” manual produced by the EQUITY Project, provides step-by-step guidance in ordering, stocking, and accounting of drugs and supplies. The information on each item is maintained on a simple stock card, enabling easy calculation of use rates and order quantities to ensure continued adequate stocks.

A system developed in the Eastern Cape Province and now applied in many provinces uses a list of 20-25 tracer drugs chosen to represent the full spectrum of Essential Drugs used at facilities. This list is placed on the pharmacy door and if any of these drugs is out of stock, even for one day, it is ticked. The number of ticks at the end of the month allows calculations of “% days out of stock” indicated each month (Figure 15). Using this monitoring tool, the supply of drugs to clinics in the Eastern Cape Province has improved dramatically.

Other provinces, such as Mpumalanga and Limpopo Provinces, have contracted out private companies who are using computers to manage the logistics. Parts of this data can be used with the DHIS to develop drug availability indicators for facilities.

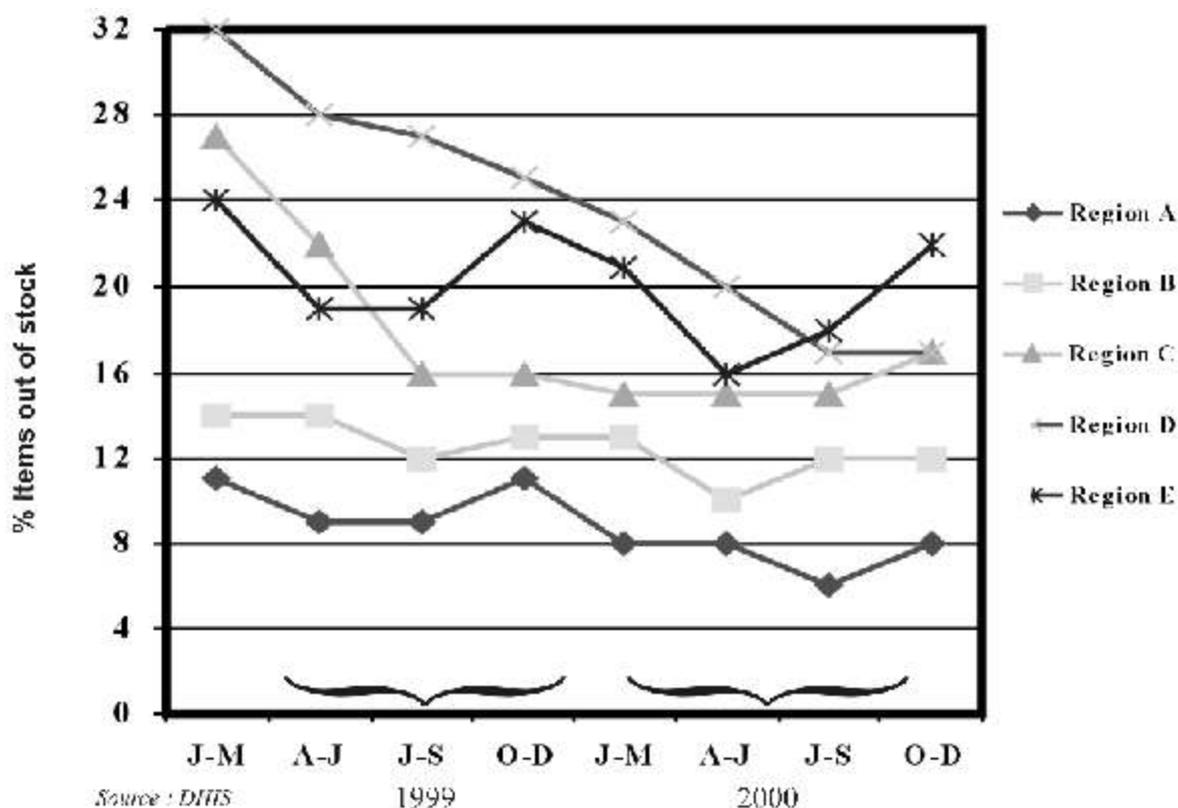


Figure 15: Tracer items stock-out 1999-2000

1. Amoxicillin 125mg/5ml Suspension (75ml)	14. Glibenclamide 5mg
2. Test, Glucose in Urine (50 sticks)	15. Hydrochlorothiazide 25mg
3. Condom	16. Mebendazole 100mg
4. Gloves Disposable, Non-Sterile	17. Paracetamol 500mg
5. IV Giving Set (60 drops)	18. Rifampicin/Isoniazid/Pyrazinamide/ Ethambutol 120/80/250mg)
6. Needle (21G, 22G or 23G) Disposable	19. Half Darrows Solution, IV (200ml)
7. Syringe, 5ml, Disposable	20. Adrenaline 1/1000 (1ml) Vial
8. Beclomethasone Inhaler	21. Norethisterone Enanthate or Medroxyprogesterone Injection
9. Oral Rehydration Salts	22. DPT/Hib Vaccine (vial)
10. Amoxicillin 250mg	23. INH Rifampicin Tablets
11. Ciprofloxacin 500mg	24. Vitamin A Capsules (200,000 units)
12. Co-trimoxazole 480mg	
13. Doxycycline 100mg	

**Table 1: Tracer drugs in the Eastern Cape Province**

## Laboratory data

All data on laboratory tests done by the National Health Laboratory System is computerised. Presently, these records are available only in the laboratory. In a trial in certain districts, results of priority tests such as antenatal syphilis tests (WRs), TB sputum tests, and cervical smear (PAP) tests are being sent automatically to the district management team to provide laboratory test feedback to facilities on key public health interventions. This system should soon be available to all facilities through the DHIS.

Key indicators from this system are :

- % of 1st TB sputum positive who receive 2-3 month follow-up sputum
- % ANC who have WR done
- % women over 35 who have PAP smear done every 10 years
- % of PAP smears that are usable

## Financial data

Most financial management is currently done at district level or higher, but with increasing decentralisation, each facility should eventually become a “cost centre” within the district, with the facility manager controlling expenditure according to a budget. This will require simple financial information for the facility manager, who should know the cost of the staff salary component, the cost of drugs (printed automatically on the list of products delivered) and the cost of supplies and equipment purchases. In addition, there should be a “petty cash” budget available for small local purchases. Unfortunately, this is far from being reality in most of the country, apart from a few larger local authority facilities.

A simple financial analysis tool called “Budget Expenditure Analysis Review” is enabling districts to calculate costs per client, per population served and to identify “cost drivers” or the most costly elements of a service. This assists districts to see more clearly where money goes and where savings or reallocation can best be made. In addition, as drugs are delivered directly to each facility, the depot can provide an “abc analysis”, listing the drugs delivered, arranged by total cost. This allows each facility to see clearly where the major drug/supply expenditures are made and enables cost containment through local decisions on drug use.

Key indicators include:

- Proportion of budget spent on staff, and on drugs
- Cost per client visit to the facility
- Expenditure/person/year

## Population data

At all levels, and particularly at facility level, it is important to know how many people live in the catchment area and need health services. Population figures have usually not been considered important in the past and this information is therefore often not available at facilities. Facilities are usually unable to calculate their population alone, due to overlap of adjacent population areas with the nearest alternative facility. Getting accurate data is therefore an essential responsibility of the district management team, with support of from the province.

The district management team and information officer need to sit down with facility staff to work out total catchment populations and program-specific target populations. It is important that the total of all the facility catchment populations in the district is the same as the updated census population for the district.

## Census data

There are many different ways of determining population:

- The census is the national “gold standard”, or measure by which all other population estimates are measured. In a census, all people in small areas (enumeration areas) are counted and these enumeration areas are added up to give district, provincial and national totals. Despite its problems in 1996, the census is the population figure used by the DHIS and for all provincial resource allocations. All demographic data in the DHIS is based on the 1996 census. This should be updated to mid-year population estimation, based on population growth estimates which is done automatically by the DHIS computer program. As soon as the 2001 census data become available, this will be incorporated into the DHIS and become the basis for catchment population estimates.
- House to house counting by community volunteers (enumeration) is a technique sometimes used by local authorities and surveys, but it has many problems if done on a small scale, and is usually best left to the census.

## Estimating the facility catchment population

Each facility must know the population it serves, and where that population lives. The census is good for larger catchment populations at national, provincial, district and even sub-district or magisterial district level. However, problems arise when calculating facility catchment populations because people may go to facilities that are not necessarily the closest to their homes. This may occur for a number of reasons: they go to the facility nearest their work, the transport routes may be easier to go to one facility than another or they may want privacy from family or neighbours.

The DHIS has a number of ways in which total catchment populations for facilities are estimated. These include:

- Proportion of headcount
- Census enumeration areas
- Estimation from mapping exercises or crude counts

### Proportion of headcount

At district or sub-district level, an estimate can be made by the DHIS software of the population served by each facility, based on the proportion of the overall headcount coming to each facility. Thus, if a facility has 12% of the total district headcount, it is presumed to serve 12% of the district population.

This may not always be accurate, particularly with specialist clinics or clinics near transport routes, but it is an equitable method and gives the best possible estimate presently available. Ask your district information officer for a printout of your facility's population using this method and see if it agrees with your own estimate about the actual population you serve.

#### Example

In a magisterial district with a population of 60,000 people, there are three health facilities and a mobile clinic, which together see 10,000 patients in a month. Clinic A sees 2,000, Clinic B sees 3,000, the health centre sees 4,000 and the mobile clinic sees 1,000. With this information you can calculate the population served.

Clinic	Headcount	Proportion of headcount	Population served (Proportion of headcount X population)
A	2000	20%	12,000
B	3000	30%	18,000
Health Centre X	4000	40%	24,000
Mobile Y	1000	10%	6,000
Totals	10,000	100%	60,000

Table 2: Facility catchment population based on headcount

## Census enumeration areas

The census is done every five years in South Africa and contains essential data on age, gender, occupation, economic status of the populations health facilities serve. This data can be made available by provinces to districts and facilities on maps, broken down to show enumeration areas (EAs) which can be identified to determine the catchment area of your facility. Each EA comprises about 150-200 households and is demarcated on aerial photo maps. Figure 16 shows the EAs surrounding a single clinic and a circle of 5km radius. The population within the circle is 11,580, an estimate of “catchment”. At provincial level, computerised GIS systems enable planners, working with district and facility staff that know the area, to draw lines around villages considered to be in the catchment area and then the total population is calculated automatically. In this way, it is possible for each facility to identify specific communities and their populations that come, or do not come, to the facility. This method is shown in Figure 17 which more accurately reflects the real use of the same facility. Some EAs outside the 5km circle still use this clinic, while others, tend to go to another. Preference for taxi routes, geographic barriers like rivers or steep mountains, or social preferences determine local differences.

This approach will, in conjunction with the facility mapping exercise, allow a more accurate knowledge of the catchment population. However, it requires computer skills and direct knowledge of each village, which are often not available, especially at provincial level.



**Figure 16: Catchment population by drawing a 5 km radius around clinics (estimated population 11,580)**

○ 5 km radius around clinics  
● EC\_fac.shp

⚡ District road  
⚡ River

■ Census EAs



## Births and deaths

Health workers are being encouraged to collaborate with the Department of Home Affairs by collecting details on births and deaths in the catchment areas of their clinics. Health workers should complete a birth form for each child born at their health facility. They should also complete a birth form for each child that comes to the facility for the first time. The completed form should be taken by the child's mother to the Department of Home Affairs.

Health workers should also complete a death form for each person who dies at the health facility. The recorded data will provide clinic staff with valuable information on the most important causes of death in the population that they serve. The completed form should be taken to the Department of Home Affairs by a relative of the deceased.

Once a month, clinic staff should report to the DIO the number of births and deaths that they have registered during the month. He, in turn, should provide the clinic with a 6-monthly feedback that includes a comparison of the number of reported births to the number of expected pregnancies and the number of reported immunisations. These figures should be similar. If they are not, some aspect of the health service is deficient. Either registration of births could be incomplete, or immunisation could be too slow, or the expected number of pregnancies could be inaccurate.

REPUBLIC OF SOUTH AFRICA  
DEPARTMENT OF HOME AFFAIRS  
NOTICE OF BIRTH

COMPLETE WITH BLACK INK

DATE: SERIAL NO:

SPACE FOR BAR CODE

NAME IN FULL

PLACE OF BIRTH

CITY/TOWN

GENDER

NATURE OF MARRIAGE: Civil Customary Religious

DATE OF BIRTH

SELF THROUGH PRINT OF THE CHILD

Figure 19: Birth registration form

Death reports provide information on causes of deaths and the ages of those dying. Special attention is required for maternal, infant and childhood deaths to find the causes and take actions to avoid these in the future. The special "confidential enquiry into maternal mortality" form should be completed and discussed by the District and Hospital staff for each maternal death and the Perinatal Problem Identification Program (PPIP) used to analyse each perinatal death.

Figure 20: Death registration form

## DATA DEFINITIONS

In order to ensure comparability between different facilities, districts, and provinces, it is essential to standardise definitions of both individual data elements and indicators. This is always a difficult process and requires patience, tact and determination to get consensus from a number of “experts”, each of whom has strong opinions on word meaning. These definitions are contained in the DHIS data dictionary. Some key definitions for Eastern Cape monthly PHC reports are reproduced in Table 3 on page 36. A detailed list is available on the DHIS computer program. For a full list, speak to your DIO.

## Data collection tools

There are many sources of data for a health information system:

- special surveys (e.g. Demographic & Health Survey, the Census);
- universities or NGO research;
- other government departments (Home Affairs, Education and Agriculture);
- specialised databases (FMS, PERSAL); and
- private sector studies (“Primary Health Care in the Eastern Cape, 1997-2000” by the EQUITY Project).

This manual concentrates mainly on health data that is collected routinely at public sector facilities. This consists mostly of activity data about the priority programs and semi-permanent data as described in the previous chapter. Data collection tools are normally standardised for each province and district, according to the Essential Data Set. They can be centrally printed or printed specifically to suit particular facility needs using the DHIS software. Discuss your needs with the DIO to provide customised registers, tally sheet, and report forms reflecting your clinic services.

<b>Data Field</b>	<b>Definitions</b>
PHC headcount under 5 years	All individual patients not yet reached five years (60 months) of age attending the facility during the period.
PHC headcount 5 years and older	All individual patients five years (60 months) and older attending the facility during the period.
DOTS visit – Facility	Directly Observed Treatment System visit (usually daily) by a diagnosed tuberculosis patient to receive medication.
Nurse clinical work days (PHC)	The number of actual work days by nurses, irrespective of rank, used to perform Primary Health Care services in the month.
First antenatal visit	A first visit by a pregnant woman to a health facility for the primary purpose of receiving antenatal care.
Follow-up antenatal visit	Any antenatal visit other than a first antenatal visit.
Tet Tox 3 <sup>rd</sup> /booster dose to pregnant woman	The final Tet Tox dose given to a pregnant woman. Women who have proof of being fully immunised during a previous pregnancy need only a single booster.
Oral pill cycle	A packet (cycle) of oral contraceptives issued to a woman.
Nuristerate injection	Any Nuristerate (Norethisterone enantate) injection given into a woman between 15 and 45 years.
Depo-provera/Petogen injection	Depo-provera/Petogen (Medroxyprogesterone acetate) injection given to a woman between 15 and 45 years.
Condoms distributed	Condom that has been given out or taken from distribution points in facilities or elsewhere (including campaigns).
Referred for Termination of Pregnancy	A client referred to a facility that provides Termination of Pregnancy Services.

**Table 3: Partial list of the DHIS data definitions**

## **Patient record cards**

All patients need a patient card to record the details of their interaction with the health service provider. This important document contains key details of diagnosis and treatment of all visits. While some authorities provide such a record for each patient, many others are using a simple school “copy book” in which to record their information.

This data includes:

- Personal details such as name, age, gender, patient number, identity number, date of birth, detailed physical address, etc.
- Clinical details of history, examination, diagnosis, procedures and treatment from each interaction with the health services, as well as results of special diagnostic tests such as X-ray, laboratory, etc.

In case of a medico-legal dispute, the patient record is legally binding. Traditionally, these documents have been kept at the health facility, but studies in many countries have repeatedly shown that mis-filing and loss of cards is a recurring problem. Other studies have shown that patients keep these cards/books better than health facilities because individual concern is more efficient than health service filing systems. Therefore, many facilities in South Africa are moving towards a patient-held record system. This is ideal for South Africa's mobile community, as it allows health staff to see the full history and treatments no matter where the client goes. It is the responsibility of the patient to produce this record at each visit, as well as for evidence should a medico-legal dispute arise.

There are a variety of categories of patient-held records defined according to age group or disease category, for example, Road to Health card, Child Health booklet, Women's Health book, Chronic Disease card or TB patient treatment card.

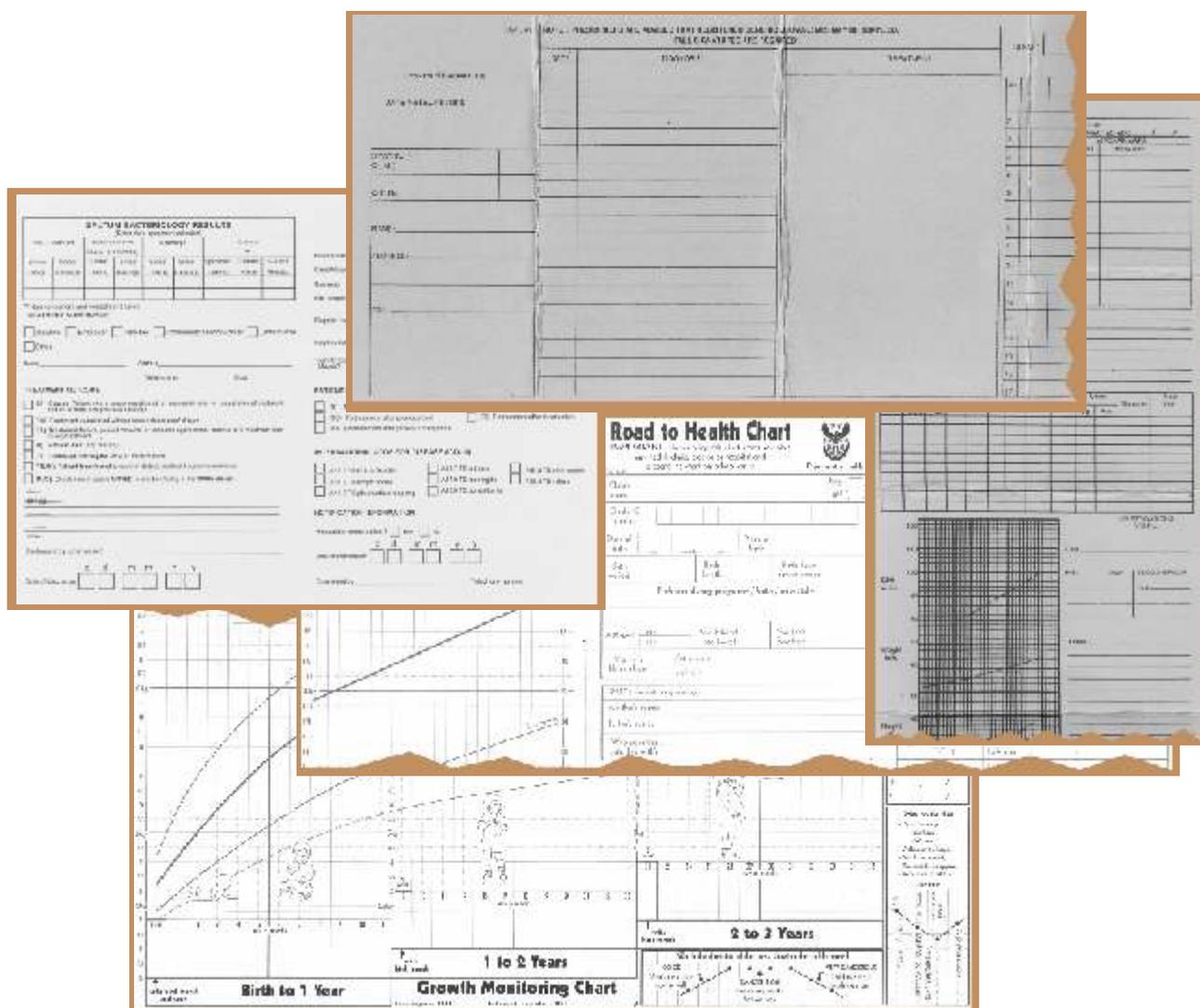


Figure 21: Various types of patient-held records

## Tally sheets

Tally sheets are an easy way of counting (tallying) identical data on conditions that do not have to be followed-up, such as headcounts, minor ailments, children weighed, etc. This data is important to collect to understand the frequency of a condition or the number of services provided, but is not useful for follow up or public health activities.

The DHIS computer software can create customised tally sheets to enable easy capture of each service category listed on the monthly report. These automatically adjust the number of circles that can be crossed under each category based on a facility's usual service load (calculated by the computer from monthly reports for the previous year). Additionally, the tally sheet can be customised to contain only categories seen by a nurse providing a certain type of service. The figure below shows a customised tally sheet for a nursing station providing care to women, with tally categories for ANC, FP and STIs only. Clinic managers can sit with DIOs to define useful tally sheets customised for the service mix and work patterns of their own particular clinic, thus making data capture easier, quicker and more accurate.

<b>Tally Sheet</b>											
NAME OF CLINIC/HOSPITAL: ec Braelyn Clinic					MONTH:		YEAR:		TOTAL		
PHC headcount 5 years and older	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
First antenatal visit	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
Follow-up antenatal visit	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
Tet: Tox 3rd/booster dose to pregnant woman	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
Oral pill cycle	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
Nuristerate injection	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
Depo-provera/Petogen Injection	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
IUCD inserted	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
Condoms distributed	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	
Referred for Termination of Pregnancy	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
Vitamin A supplement to new mother	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
Case treated as STI - new	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
Male urethral discharge - new	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
STI contact slip issued	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
STI contact treated - new	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>
Referred to doctor	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	<input type="text"/>

Figure 22: A tally sheet from women's health service

## Registers

Registers are records of data that need continuity - i.e. for conditions that need follow-up over long periods such as ANC, immunisation, FP, TB or chronic illnesses. The details kept in the registers are merely the “bare bones” needed to ensure follow-up. These include immunisations given or method of FP. Details of exactly what is done at each visit are recorded on patient-held cards.

Quality of care is vitally involved with continuity, far more than just the number of services provided. Most priority program areas require continuity and should have registers that enable a nurse to see at a glance which patients have attended clinics as expected and which need follow-up or tracing in the community. Regular review of registers enable identification of patients who must be actively pursued to assure completion of immunisation, timely continuation of contraception, full treatment of TB, or regular monitoring and control of blood pressure. The registers below show how continuity of care can be followed for a pregnant women through ANC, delivery, and full immunisation of the infant.

ANTENATAL, DELIVERY REGISTER																		
SERIAL NO	NAME	HOME ADDRESS	AGE	# OF CHILD LIVING	LMP	1st ANC	WEIGHT	HB	URINE	WR	TET TOX	DATE OF ANC				RISK FACTORS	DELIVERY PLAN	TRANS
												2nd	3rd	4th	5th			
					///	///						///	///	///	///			
					///	///						///	///	///	///			
					///	///						///	///	///	///			
					///	///						///	///	///	///			
					///	///						///	///	///	///			
					///	///						///	///	///	///			
					///	///						///	///	///	///			

Figure 23: Antenatal, Delivery Register

IMMUNISATION REGISTER																				
NAME OF CHILD	DELIVERY DATE	BIRTH WEIGHT	SEX	AT BIRTH			DPT/Hib			HBV			POLIO			MEASLES	VIT A DOSE	FULLY IMMUNISED		
				Mat VItA	BCG	POLIO 0	1	2	3	1	2	3	1	2	3					
	///			///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	
	///			///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	
	///			///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	
	///			///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	
	///			///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	
	///			///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	
	///			///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	///	

Figure 24: Immunisation Register

The family planning register allows tracking continuity of clients even when using different contraceptives.

FAMILY PLANNING REGISTER										CLINIC							
										YEAR							
NAME	ADDRESS	# LIVING CHILDREN	METHOD	DATE 1 <sup>ST</sup> STARTED	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	CONTINUE NEXT YEAR

Figure 25: Family Planning Register

Another system designed to assure continuity is the sorting card and appointment box. A patient card is filed in the section for the next appointment due - if the patient arrives, the card is refiled to the next appointment, if the client does not come when expected, the card remains indicating need for special home visit or other means of contact.

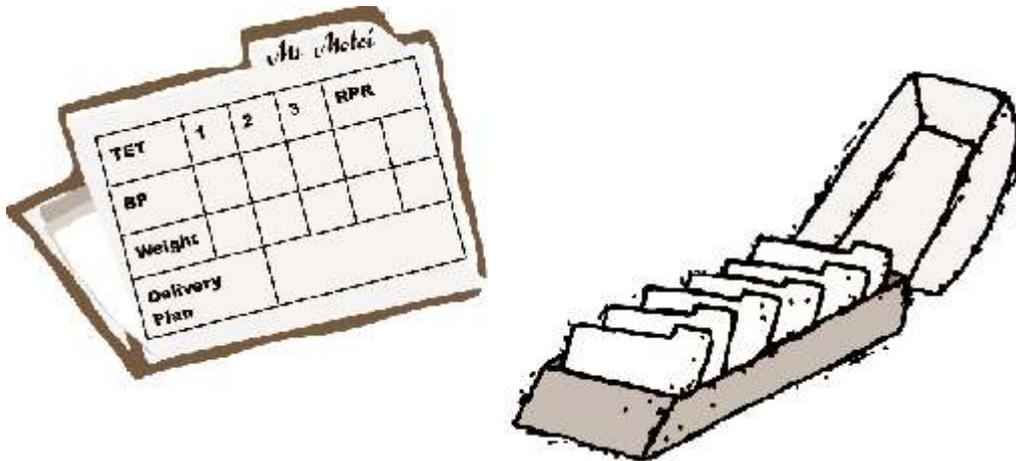


Figure 26: Sorting card and appointment box

### Tick registers

Tick registers are an easy form of register in which pre-determined columns assist health workers to mark important data items.

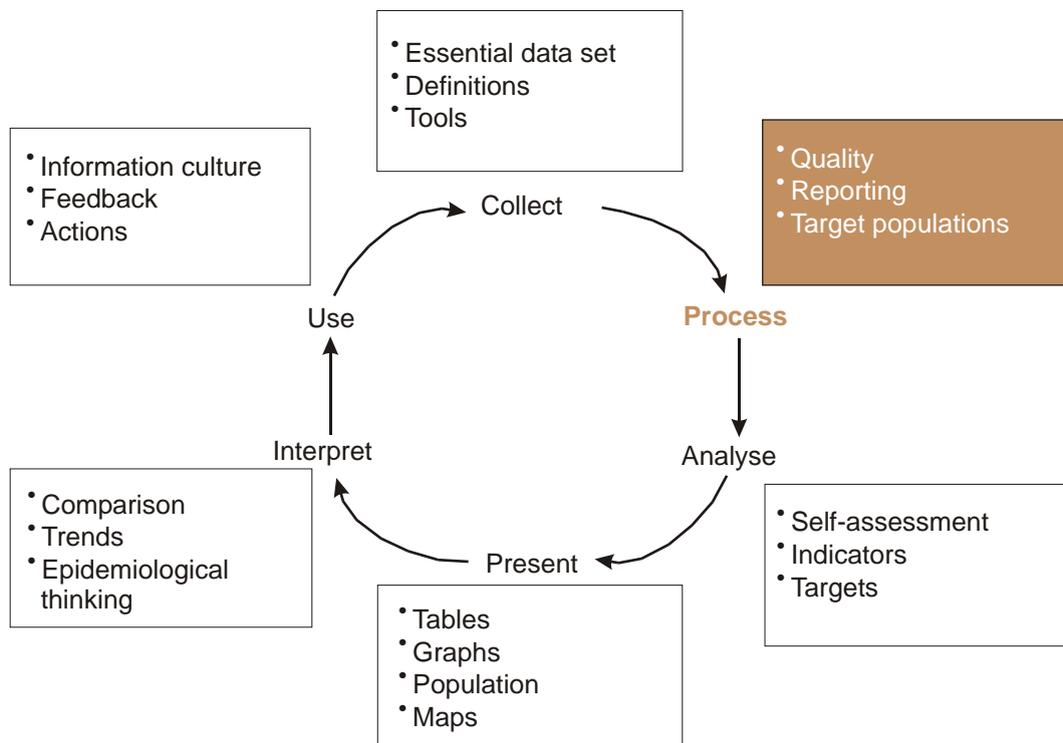
Tick registers have been used successfully in many parts of South Africa, particularly in the Eastern Cape Province, where the PHC tick register has been used for many years. A problem with most tick registers is that recording minor ailments wastes a great deal of space (and therefore money). These are better recorded in a simple notebook (if the supervisor uses it to check quality of care or drug use) or a tally sheet just for "minor ailments".



# Chapter 3

## The Information Cycle: Processing Data

### The Information Cycle



Merely collecting data is not enough. Before it can be turned into information, raw data needs to be processed to ensure quality, consistency, and accuracy. It then needs to be aggregated and tabulated in a form that aids future analysis so that it can be reported both vertically (sent up to higher levels) and horizontally (shared with all staff, other facilities or districts) and fed into a computer to be communicated.

## ENSURE DATA QUALITY

No data set is ever perfect. Data needs to be “cleaned” before it is useful to local managers. The goal of cleaning data is to ensure that data errors are small enough so they do not bias decision-making. The worldwide experience is that the more that information is used by people who collect it, the more accurate it will become.

Good quality data should be :

- Available on time and at all levels
- Correct, complete and consistent
- Reliable and accurate enough to support decisions
- Represent all recorders of similar data
- Comparable i.e. using the same definitions of data items

Old data is of historical value only - decisions must be made based on current information

It is better to be roughly right, than exactly wrong

If we don't measure by the same tool we can't compare each other's results

In South Africa, the quality of data has improved enormously since the new DHIS was introduced. Common sources of error, however, still include:

Error	Example
Missing data	Data items for whole months missing
Duplicate data	Multiple counting of a fully immunised child
Thumb suck	When data collection tools are not used routinely, staff just fills in a likely-looking number (often using preferential end digits!)
Unlikely values for a variable	A man being pregnant; low birth weight babies exceeding number of deliveries
Contradictions between variables	100 births in a month when there are only 2,000 women in childbearing age
Calculation errors	Mistakes in adding
Typing error	Data is wrongly entered onto the computer
Capture in wrong box	Condoms distributed in the place of intra-

Figure 29: Common sources of errors

## Visual scanning (eyeballing)

The most effective way to ensure data quality is to look at the data. Look first across each line and then from top to bottom; it is important to look for missing data values, obvious fluctuations, inconsistencies between linked data elements, and for mathematical errors.

Important issues to look for include seasonal variations over time, variations outside of the set maximum/minimum ranges and facility comparisons.

Check data visually for:

- **Correctness**..... Are all data within normal ranges? Are there any preferential end digits used?
- **Completeness** .....have all units and facilities submitted all the data they should?
- **Consistency** ..... are data in the same range as this time last year? As other facilities?

Problems in filling out forms or sending them should be reported.

## What to do if you find errors

### Find the cause

Go back to the person who has collected the data, point out the problem and get the collector to appreciate the need for accuracy. Perhaps he/she does not understand the definition of the data, or has double counted or collected incorrectly.

## Routine Raw Data For

OrgUnit 4: ec Nelson Mandela Local Service Area

OrgUnit 5: ec Motherwell NU 8 Clinic

	Nc
PHC headcount under 5 years	1
PHC headcount 5 years and older	2
DOTS visit - Facility	3
Nurse clinical work days (PHC)	4
First antenatal visit	6
Follow-up antenatal visit	7
1st Tbx 3rd/booster dose to pregnant wo	8
Oral pill cycle	13
Nuristorate injection	14
Depo-provera/Potegen injection	15
Condoms distributed	17
Diarrhoea under 5 years - new	19
Lower respiratory infection under 5 years	20
Child under 5 years weighed	21
Not gaining weight under 5 years	22
Severe malnutrition under 5 years - new	23
FEM client under 5 years	24
DTP-Hib 1st dose	26
DTP-Hib 2nd dose	27
DTP-Hib 3rd dose	28
OPV 1st dose	29
OPV 2nd dose	30
OPV 3rd dose	31
HepB 1st dose	32
HepB 2nd dose	33
HepB 3rd dose	34
Measles 1st dose at 9 months	35
Immunised fully under 1 year - new	36
Measles 2nd dose at 18 months	37
Suspected TB case	38
TB patient under treatment	39
TB patient on DOTS - Facility	40
TB patient on DOTS - Community	41
Case treated as STI - new	42
Male urethral discharge - new	43
STI contact slip issued	44
STI contact treated - new	45
Mental health visit	46
Referred to doctor	55
Amoxicillin 125mg/5ml suspension (75ml)	101
	102

	2001 Jan	2001 Feb	2001 Mar	2001 Apr	2001 May	Total
	1178	1155	1186	1188	1062	5759
	11975	11167	13008	10865	10264	57279
	2940	2418	3906	4140	1064	14568
	192	207	237	234	181	1051
	151	36	27	22	47	283
	104	85	97	68	80	434
	44	29	27	64	28	193
	102	138	141	168	144	693
	529	465	538	476	472	2480
	600	393	523	326	291	2033
	2000	2000	3000	1000	2500	10500
	6	47	7	1	4	65
	9	5	3	35	31	83
	1178	1155	1186	572	520	4711
	30	20	22	27	22	121
			7			7
	30	20	27	27	22	126
	77	35	52	38	40	242
	71	29	36	52	35	223
	72	35	48	56	29	240
	77	35	52	38	40	242
	71	29	36	52	35	223
	72	35	48	58	29	240
	63	25	36	54	19	197
	63	25	36	54	19	197
	66	29	52	88	25	238
	64	71	37	42	48	260
	194	197	199	207	233	1030
	147	157	164	164	184	816
	47	40	35	48	49	214
	412	243	284	218	337	1494
	19	58	50	47	71	245
	276	90	130	115	90	701
	12	58	58	89	122	337
	1					1
	20	10	30	30	50	140
	1		1			2

Very low!

low!

Fewer than 1 per client?

Table 5: Monthly report

## Correct the error

Go back to the source data register, tally sheet or card, and get the correct number to put in the report. Always write an explanation in the "comments" space.

## Prevent future errors

Make sure your data collector understands the importance of the particular data item and 90% of the problems will be resolved. Remember to check this particular item next month to see that this is not a recurrent error.

The DHIS has been carefully designed to minimize errors:

- Data collection tools have been designed with suggestions from data gatherers. They are as simple and user-friendly as possible and should be custom-designed to include only the actual services provided by your facility. For example, if your facility does not do deliveries, deliveries should not be on your reporting form. The information officer can produce a form tailored to your facility from the DHIS computer program.
- The definitions of all data items are all clearly stated and standardised so that everyone understands them and they suit local needs. Keep a list posted in your facility.
- For every data space, there is a place for “comments”, enabling the person filling the form to clarify unusual data or reasons for missing or strange numbers. This is an essential step for data quality.
- Data entry is physically checked by facility in-charges and supervisors to make sure that the data submitted for entry into the computer is as accurate as possible. Signature by the supervisor signifies that the data has been checked. Try to visit the computer office in your district and see how data from your facility is entered and validated.
- Supervisors in many provinces are being trained in DHIS and their checklist is focused on the quality and use of information to improve quality of care. They are required to verify the accuracy of each monthly return by signing it before submission.
- Reporting procedures are all standardised and all facilities report directly to the district information officer, by an agreed date each month. Be certain your return is submitted on time.
- The DHIS software has computerized quality checks such as maximum/minimum values and validation rules. These should be discussed directly with you so you can add meaningful explanations in the “comments” box if data falls outside of expected range. You can also ask to have the maximum/minimum values changed to better reflect your situation.
- Feedback is assured when the district information office sends you a monthly computer printout showing your data after they have entered it into the computer and checked using computer tools and validation rules. Insist on getting this from your supervisor each month.

## COLLATING DATA

Collation (also known as aggregation) is the gathering together of data from various sources and putting it together into one comprehensive and representative report. In larger facilities, this will usually mean the gathering of reports from all the different units, e.g. the different examining rooms: maternity, paediatrics, curative care; mobile clinics; and relevant personnel including admission clerks, community health workers and after-hour personnel. These different reports need to be collated into one report for the facility. All the same data elements are added together to enter the relevant blank on the report. Care must be taken **not** to duplicate data: e.g. if headcount is recorded by a clerk at the entrance, do not also add headcount from each examining room or service.

Collation of data from all facilities is performed by computers using the DHIS software. This provides accurate summation of data at district and higher levels as well as comparison between facilities. Eventually, computers will be used at facilities to capture and process data.

## REPORTING DATA

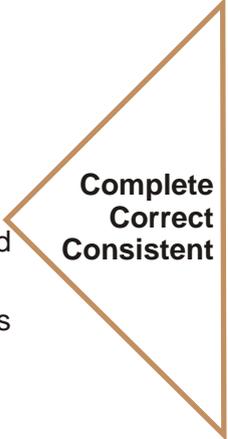
### Monthly PHC reports

The monthly report form is the key element in the process of self-assessment at each facility and is a crucial responsibility of the facility manager. It represents a valuable summary of the activities of the facility and its proper use involves a number of critical steps.

The report forms should be standardised for each clinic at the district information office according to services provided. If there are data items on your report form that you do not perform (e.g. deliveries, chronic care, etc.), speak to your supervisor or the district information officer to change your report form.

The steps to follow in processing your monthly reports are:

- Proper collection and collation of information.
- Data gatherers to ensure quality.
- Facility manager checks for data quality.
- Discuss with supervisor, get comments and signature.
- Graph key data each month to make progress visible and comparisons or trends more obvious.
- Assess, Analyse and Act on data before reporting it. This AAA cycle needs to be repeated monthly.
- Insist on feedback from the DIO.



**Complete  
Correct  
Consistent**

The monthly report should be filled at clinic level and sent by the facility information coordinator to the supervisor/district information office within 5 days of end of month (or another date if so agreed). It is the responsibility of the facility manager to check the report and provide quality data to the district office or supervisor.

All reports need to be reviewed by facility managers and supervisors, have the data verified and discussed, with basic indicators calculated and graphed.

### Routine Monthly Data Input Form

OrgUnit4: ec Ingquza Local Service Area

COMPLETED BY (Print Name): \_\_\_\_\_

OrgUnit5: ec Goso Forest Clinic

MONTH - YEAR (eg Aug 2000): \_\_\_\_\_

No	Data Element	Normal range	Value	Comments
<b>Attendance</b>				
1	PHC headcount: under 5 years	108	486	
2	PHC headcount: 5 years and older	726	1 295	
3	DOTS site - Facility	0	2	
4	Nurse clinical work days (P-IC)	11	52	
<b>Maternity and neonatal services</b>				
6	First antenatal visit	10	15	
7	Follow-up antenatal visit	8	22	
8	Tet Tox 3rd booster dose to pregnant woman	0	5	
9	Live birth	0	0	
10	Live birth under 2500g	0	0	
11	Delivery to woman under 18 years	0	0	
12	Still birth	0	0	
<b>Reproductive Health</b>				
13	Oral pill cycle	14	97	
14	Microneedle injection	45	68	
15	Depo-provera/Patogen injection	28	65	
16	LCD inserted	10	5,600	
17	Condoms distributed	108	340	
18	Referred for Termination of Pregnancy	0	0	
<b>Child Health</b>				
19	Diarrhoea under 5 years - new	14	26	
20	Lower respiratory infection under 5 years - new	0	0	
21	Child under 5 years weight lost	45	118	
22	Not gaining weight under 5 years	4	7	
23	Severe malnutrition under 5 years - new	0	3	
24	PFM client under 5 years	9	15	
<b>Immunisation</b>				
25	BCG dose	0	23	
26	Vitamin A supplement to new mother	0	0	
27	DTP-H b 1st dose	7	15	
28	DTP-H b 3rd dose	5	15	
29	OPV 1st dose	9	23	
30	OPV 3rd dose	0	17	
31	Hep B 1st dose	8	20	
32	Hep B 3rd dose	10	16	
33	Vitamin A supplement to 0-11 months infant	0	0	
34	Measles 1st dose at 9 months	10	16	

**Table 6: Partial monthly report for PHC facilities in the Eastern Cape Province**

## Vertical and horizontal reporting

Data transmission should always reflect the administrative structure of the health services, so vertical transmission to “higher” levels is the expected practise. This includes:

- Client management data transmitted to referral hospitals;
- Health unit management data, such as immunised children or women attending ANC;
- Health system management, such as financial transactions for auditing or notification of diseases for disease surveillance.

However, with the new DHIS reflecting a decentralised health system, there is increasing emphasis on horizontal transmission to other information users at the same level. Examples of this include:

- Data used by community leaders concerning perceived quality of local services such as antenatal care or immunisation;
- Data from pharmacies that is locally processed to calculate FP coverage;
- Feedback from facilities to communities on coverage of health services;
- Data shared between facilities falling under the same supervisor in order to learn best practices from each other.

Facility managers need to make regular reports to other government departments (education, transport, communication), local government, politicians, and the facility committees. Similarly, district managers need to provide regular feedback to other government and community organisations at district level as well as to their own staff.

## Notifiable disease report

Notifiable diseases are the key element of epidemiological surveillance in South Africa. Certain important diseases are reported on a standard form (GW17/5). The purpose of the notifiable disease system is to detect outbreaks of important diseases, and to take appropriate action to contain them. Thus, new cases of a communicable disease often need to be notified by phone to initiate action.

Currently this needs improvement and a major effort is under way to reduce the number of notifiable diseases so that only important diseases are reported, and appropriate action taken on each report.

GW17/5

**Notification of medical condition**  
(Sections 32, 47(i)(a) and 47(i)(b) of Act 63 1977)  
Department of Health



**Aanmelding van mediese toestand**  
(Artikels 32, 47(i)(a) en 47(i)(b) van Wet 63 van 1977)  
Departement van Gesondheid

Please print ● Where appropriate, mark the correct box with a tick (✓) ● Complete in duplicate. Original to be sent to local authority where patient was diagnosed; copy to remain in book.

Gebruik aasbeelief drukskrif ● Waar toepaslik, merk die korrekte blok (✓) ● Voltooi in duplikaat. Die oorspronklike word gestuur aan die plaaslike owerheid waar die pasiënt gediagnoseer is; die afskrif bly in die boek.

DETAILS OF PATIENT				BESONDERHEDE VAN PASIËNT			
Surname		Van		First names		Voorname	
Age	Ouderdom	Sex	Male <input type="checkbox"/> Maleik Female <input type="checkbox"/> Vroulik	Geslag	Ethnic group	Asian <input type="checkbox"/> Asier Coloured <input type="checkbox"/> Kleuring	Black <input type="checkbox"/> Swart White <input type="checkbox"/> Blank
Residential address				Woonadres			
If resident on a farm, state farmer's name as well as name and number of farm. In other rural areas: give name of chief, induna, village, nearest hill or river, nearest school or clinic.				Indien woonagtig op 'n plaas, noem die boer se naam sowel as die naam en nommer van die plaas. In ander landelike gebiede, gee die naam van die stamkaptein, induna, dorp, naaste heuwel of rivier, naaste skool of kliniek.			
District							

Figure 29: Notifiable disease report

## Tuberculosis reports

Tuberculosis (TB) reports are done quarterly in most of South Africa. TB is a priority disease in South Africa and has had a rising incidence in our population over the last decade. Presently about four of every one thousand population are diagnosed with a new case of TB each year. In some parts of the Eastern Cape Province, the incidence is as high as 10 in every thousand, or 1% of the population with newly diagnosed TB every year. As this disease requires regular daily therapy for at least 6 months, the recording and reporting system for TB is of extreme importance in the PHC system. Success of containing the TB epidemic is vitally dependant upon an accurate and well used reporting system.

The TB Control Programme uses a number of record keeping registers:

- **Green Card** - is kept with the patient and is a record of the daily treatment for TB.
- **Blue Card** - is a more comprehensive patient record. This card records the details of diagnosis, of treatment, of laboratory tests and contact information. This card is kept in the clinic and can be used effectively to monitor the progress of individual patients. These cards can be kept in separate files by category (outcome this month, treatment suspended, need home visit, etc.) enabling easy counting to prepare monthly and quarterly reports.
- **Patient TB Register** - records each patient who is diagnosed at the clinic or transferred into the clinic for TB care. Reports in this register are submitted to the district each quarter. A new electronic TB register is being introduced throughout South Africa that will enable capture of the information on this register by computer at the district level. Quarterly reports will be generated automatically by the computer.

Detailed instructions on the use of green and blue cards, the TB register, quarterly reports, and the laboratory register of sputum examinations is provided in the document on TB information systems from the National TB Directorate.

## Monthly TB reports

A special project, started in Port Elizabeth, has demonstrated the usefulness of several important indicators of TB case finding and management. Each month, by following these indicators with the help of the blue cards to sort patient information, better control of the TB program is assured. The TB information system in use in Port Elizabeth is part of the routine DHIS. The data definitions, data collection forms and indicators are explained in Appendix B. These enable workers to better control and optimize:

- case finding activities,
- sputum examinations and conversion,
- Directly Observed Treatment Shortcourse (DOTS) treatment,
- suspenders (those who stop treatment for 5 days or more),
- reintroduction of suspenders into the program of daily treatment before they become interrupters (stopped treatment for 2 months or more),
- contact tracing,

- prophylactic treatment for children under five, and
- treatment outcomes: cured, treatment completed, transferred out, died and treatment failure.

These monthly data and indicators facilitate better management of the TB control program and are currently used in addition to the quarterly reports to monitor and manage TB. Soon the quarterly reports will be automatically generated by a district level computer relieving clinics of the burden of these calculations while assuring monthly monitoring of TB cases with a much abbreviated set of data elements and indicators designed by the nurses to suit operational needs.

## TARGET POPULATION FOR PROGRAMS

The previous sections in this chapter describe the processing of numerator data - the services provided, diseases seen, the work done in the clinic. To calculate indicators, information on the population served or affected by different illnesses is needed.

General information on the total catchment population is not enough. The raw population data needs to be processed so that facility staff know the target population (those sections of the total population needing specific services) to be served by each program and can put this into a facility population table.

Each priority health program has a different target group for which it provides services. In order to quantify these groups, the population is divided according to age groups, sex and certain risk factors. These are outlined in the table below:

Target population	Percentage (Approximate)
Total population	100%
Pregnant women needing antenatal care and delivery	*
Children under one year needing immunization and growth monitoring	+/- 3%
Children between birth and four years needing growth monitoring	+/- 12%
School age children 5 - 15 needing screening and health education	+/- 17%
Woman between 15 and 45 who are fertile and need family planning services	+/- 23%
Men over 15 years for male urethral discharge	+/- 30%
Both sexes over 45 who may need care for their chronic conditions	+/- 15%

\* NB for the purposes of the DHIS, ANC, delivery and children under 1 year are considered to be the same number, though this is not strictly accurate

**Table 7: Target population for priority programs**

These percentages are not uniform across the country, but give approximate estimates as found in most populations of South Africa. The proportions of the total population in each age group vary by province, district and even sub-district, according to urban/rural balance, level of education, family planning use, socio-economic status and migration patterns.

The DHIS database on the district level computer contains the estimates for each facility for each age group by sex. These reflect more accurately the true picture based on the census for each district. Ask your DIO for a printout of this population data for your facility. Keep it easily available so you can calculate any group of interest to your facility (e.g. adolescent girls age 15-19 years, or school children age 5-14 etc). The DHIS computer calculates new population estimates for each year, based on estimated population growth rates. These figures need to be carefully calculated and agreed upon for each facility by the district information team, working closely with the facility information coordinators.

## Population table

For each target population group, you should plan activities and calculate the number of expected interventions for the facility for the year, and for each month. The same principle applies to non-personal health services such as water and sanitation projects.

Every facility should have a simple table displayed on the wall showing the population served by its different programs as well as the expected monthly activity level. The easiest way of looking at the population is to divide it into age groups according to the target age group for services. For comprehensive PHC services, the population can be divided into age and gender groups as described before.

### Example

For a clinic with a catchment population of 12,000 people of whom 3% are under one year, they should have 360 fully immunised children a year, or 30 children a month.

The following table shows the target population for various programs run at Sibonile Clinic, broken down to the expected number of activities each month. Note that the % of total population is taken from the census data at the district.

Program target population	% Total population	Number of activities	Objective for year	Number of activities each	
				Year	Month
Fertile women 15-45 years (Family planning)	22.8%	2736 women protected	45% Couple year protection	1231 women protected	103 women protected
Expected ANC's	2.8%	336 pregnancies	85% ANC 1 <sup>st</sup> visits	285 new ANC	24 new ANC
Expected Deliveries	2.8%	336 deliveries	60% by trained staff	202 deliveries	17 deliveries
Children under 1 year (Immunisations)	2.8%	336 children < 1 yr	90% fully immunised	303 fully immunised	25 fully immunised
Children 1-4 years (Growth monitoring)	11%	1320	4 weighings /child/year	5280 weighed	440 weighed
School age children 5-15 years	17%	2040	1 screening / year	2040	170 screened
Houses with no toilet	55%	1760 households	10%/ year	176 toilets	15 toilets

Table 8: Sample target population table for Sibonele Clinic (12,000 population)

## Activity

### Population table My Clinic

Prepare a table like this with other useful targets as well. This should be prominently displayed on the wall of the facility for everyone to see. Your supervisor will help you make sure that it is correctly completed and kept up to date each year.

Program	% of total population	Number of activities	Operational target	Number of activities provided each	
				Year	Month
Fertile women 15-45 years (FP)					
Expected Antenatals					
Expected Deliveries					
Children under 1 year (immunising & growth monitoring)					
Children 1-4 years (growth monitoring)					
School age children 5-15 years					

Make a large poster like this using your own population and place it on the wall.

Each facility, sub-district and district should have a simple chart of the population served which looks something like the above table.

The three most important figures for your facility:

Total population

Annual newborns  
(same for ANC,  
deliveries and children <1 year)

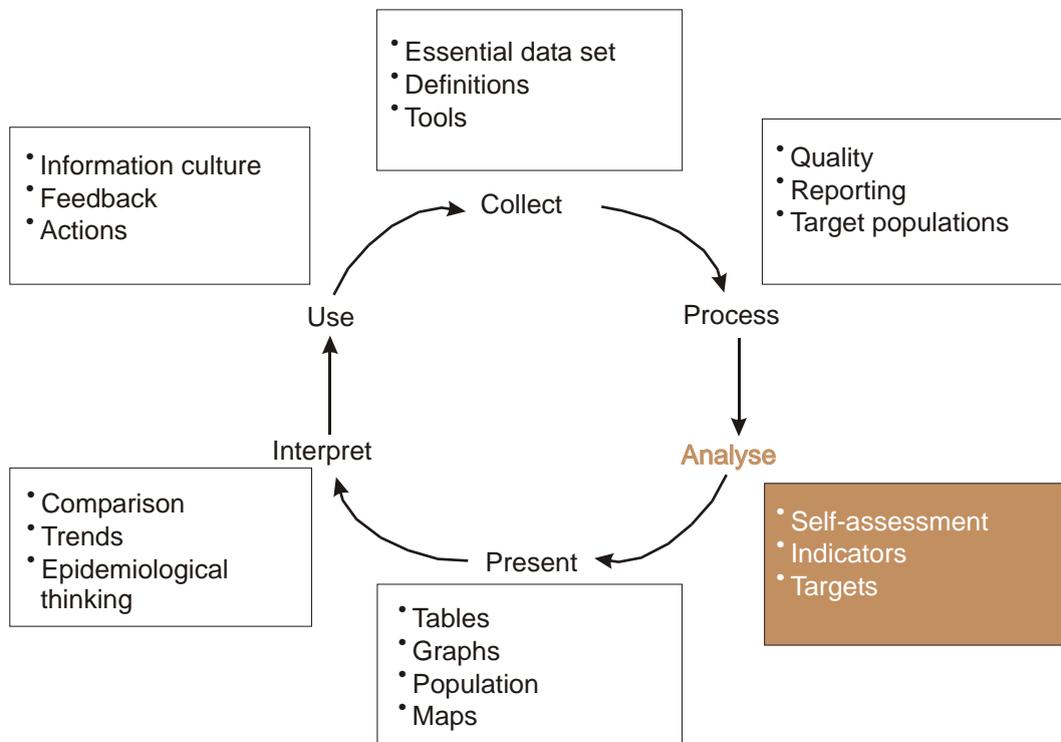
Women 15-45

MEMORISE them!!

# Chapter 4

## The Information Cycle: Analysing Information

### The Information Cycle



This analysis is done in terms of the planning cycle already discussed in Chapter 1, and concentrates on the use of indicators that measure programs' progress towards annual targets. At facility level, most analyses are in the form of self-assessment, i.e. comparison of actual activities against plans made and targets set.

## SELF-ASSESSMENT

As a facility manager, you need your information system to answer four basic questions about your services:

- Did everyone who should have received services receive them? (Coverage)
- How good is the service provided? (Quality)
- Did you follow-up clients who needed it? (Continuity)
- Did you identify all clients with potential problems? (Risk)

These concepts: coverage, quality and coverage, continuity, and risk are the cornerstones on which self-assessment is based. Every month, every facility must ask themselves these four questions about every program that is functioning at the facility.

## Coverage

Analysis of coverage means looking at who actually received services and comparing that to the clients who should have received services. For example:

- Of all the pregnant women in the catchment population, how many received ANC?  
How many delivered under supervision?
- Of all the children under one year, how many were immunised?

## Quality

Analysis of quality implies looking at whether clients received the best possible treatment. This will often need reference to protocols and guidelines. Standardised treatment requires answers to questions like:

- What proportion of women receiving ANC got a full course Tetanus Toxoid vaccination?
- What proportion of STI clients were properly treated with ciprofloxacin?
- Did children under one get the correct vaccines at the right intervals?
- What proportion of my epileptic or hypertensive clients are correctly controlled?

## Continuity

Many PHC activities do not need a single intervention, but a series of related interventions that combine to protect or treat a client. You should ask:

- How many of the children who started vaccination completed the nine vaccinations and became fully immunised?
- How many pregnant women received three or more antenatal visits?
- What proportion of diabetic clients came for their monthly check-up?

## Risk

Many preventive activities attempt to identify potential risk factors in clients and then intervene to minimise these risk factors. The information system should answer questions like:

- What proportion of ANC clients had specific risk factors identified?
- What proportion of all curative clients were referred to higher levels?
- What proportion of women over 35 had a PAP smear taken?

The planning tool that helps answer these questions is the indicator, which allows measurement as to whether one is achieving what one has planned to do.

# INDICATORS

Indicators are the tools that the DHIS uses to convert raw data into useful information and to enable comparison between different facilities. While the information system collects data, this data has to be made into information in the form of indicators, which relate the data to standardised populations or sub-groups or items. Only when this analysis has been made can data from different sized units be meaningfully compared. One does not use terms like “a lot” or “not many” to describe immunisations given, one gives numbers or “data”. But that still does not say much, because the size of clinics, numbers of staff, types of illness and population served all affect the numbers. So, one calculates “indicators” to communicate how numbers compare based on the same size of population or staff, etc. One calculates numbers of patients served *per nurse* or *per 100 population* or *per type of client*. These “indicators” can be compared across any different facility size or population.

Indicators are generally defined as “variables that help to measure changes, directly or indirectly” (WHO 1981). In the context of a DHIS, indicators:

- Convert raw data into useful information;
- Are observable markers of progress towards defined targets;
- Are used to describe the situation and to measure changes over time;
- Provide information about a broad range of conditions through a single measure;
- Provide a yardstick whereby institutions or teams can compare themselves to others doing similar work.

Indicators enable us to compare “apples” with “apples”, not with “melons”!

## Calculating indicators

Indicators are easy to calculate, once they have been developed. We all learned how to calculate indicators when we learned division at primary school! All health workers should be able to calculate routine indicators - not just the managers and program heads. Otherwise this essential activity concentrates the power of knowledge in a few hands and ordinary health workers remain disempowered.

Indicators are usually made up of a numerator (top number) that is divided by a denominator (bottom number).

**Numerators** are the things we count: numbers of clients, infants immunised, new cases of TB, number of doctors, etc.

**Denominators** are the group with which the things we count are compared: total population, all births in a year, number of adults or numbers of clinics, total miles travelled, number of beds in the hospital.

$$\text{Indicator} = \frac{\text{Numerator}}{\text{Denominator}} \times 100 = \dots\%$$

## Classification of indicators

There are four main types of indicators (WHO 2000):

Type of indicator	Description	Example
Count Indicator	Number of events without denominator	Number of new cases of Acute Flaccid Paralysis
Proportion Indicator	Numerator is contained in the denominator	Proportion of health centres without electricity
Rate Indicator	Frequency of the event in a specified time in a given population	Incidence of new TB cases in a given population per year
Ratio Indicator	Numerator is not included in the denominator	Ratio of nurses to population Ratio of male TB deaths to female TB deaths

Table 9: Indicator Type

## The ideal indicator

While it is easy to calculate indicators, their selection and construction is a complex and difficult process that takes great understanding, discipline, teamwork and negotiation. Much care is needed to define and choose indicators to be certain their definitions are clear and that they indicate what you intend them to. The ideal indicator **RAVES**:

- Reliable** Gives the same results if used by different people in different places
- Appropriate** Fits in with local needs, capacity and culture and the decisions to be made
- Valid** Truly measures what is of interest
- Easy** Able to be simply calculated using routinely available data
- Sensitive** Changes in the indicator immediately reflect changes in the actual situation under study

**Look for better indicators, not more indicators**

The number of indicators should be kept to a minimum. If the “ideal” indicator could be found, only one would be needed for each program area! There should always be more indicators than data: a rule of thumb for a good information system is that every data element is used to calculate two or more indicators. This shows that data is action-led and linked to indicators.

## Operational targets

As discussed in a previous chapter, goals are broken down into a number of objectives which are measured by indicators. The level of accomplishment of these are set as targets, which show the intended level of accomplishment. Targets need to be phrased in a way that enables health workers to be able to know exactly what they need to achieve, by when, and to what degree. These targets need to be agreed upon by all role-players, express the goal/objective in a specific and measurable way and add a time component. In other words, they need to be **SMART**:

<b>Specific</b>	Measure real changes in the situation concerned
<b>Measurable</b>	Able to be easily and precisely quantified
<b>Agreed</b>	Consensus reached with all major role-players
<b>Relevant</b>	Fit local needs, capacities and culture using available resources
<b>Time bound</b>	To be achieved by a certain time

Objectives state exactly what has to be achieved, by whom and by when and are usually set for periods of one to five years. Targets may be set to achieve partial levels of objectives in shorter time periods, say months to a year. Specific objectives are usually accomplished through activities that are carried out to achieve them and the progress is expressed through achieving fixed milestones.

Medical care	<ul style="list-style-type: none"> <li>• Provide comprehensive PHC consultations for an average of 3 attendances per person in the population annually.</li> <li>• Provide basic curative care at all outreach sessions by Dec 31st, 2002.</li> <li>• Treat all patients according to standardised guidelines by July 2003.</li> </ul>
Mother & Child Health	<ul style="list-style-type: none"> <li>• Train 200 traditional birth attendants (TBA) by Dec 31st, 2002.</li> <li>• 80% of deliveries supervised by trained personnel by Dec 31st, 2004.</li> <li>• Reduce the incidence of diarrhoea in under five's from 5/1000 to 3/1000 within 5 years.</li> </ul>
Drugs	<ul style="list-style-type: none"> <li>• Every facility stocked with all necessary drugs for comprehensive care by Dec 31st, 2002.</li> <li>• Ensure that not more than 10% of drugs are out of stock in any month by Dec 31st, 2001.</li> <li>• Reduce the delay in ordering to under one month.</li> </ul>
Water & Sanitation	<ul style="list-style-type: none"> <li>• 40% of all rural households with a potable water source within 200 meters by Dec 31st, 2004.</li> <li>• 25% of all households with latrines by Dec 31st, 2004.</li> <li>• 90% of houses with a covered refuse dump by Dec 31st, 2004.</li> </ul>

**Figure 30: Some objectives that might be chosen for a PHC facility**

## Local objectives

Objectives are often set at national or international level. To show local level of effort, each management team needs to adapt targets to suit local conditions and possibilities according to local capacity and resources. These local targets should be well known locally, discussed with local leaders and other ministries and prominently displayed on the notice boards of all institutions.

For each program area, there should be a table that states the goal and objectives of the program and the indicators by which they will be measured. This table should be prominently displayed on the facility notice board so that everyone knows where the program is going.

In Appendix A, these indicators are further specified and broken down in terms of definition, numerator and denominator, targets, actions to consider etc.

## Outputs

Outputs are the things that need to be done in a certain time frame to achieve objectives. These outputs are usually measured as the numerators of indicators and as such should be routinely collected by health workers as part of the Essential Data Set.

Examples of outputs for the water and sanitation example on the next page would include:

Number of water standpipes installed
Number of toilets built
Number of refuse pits covered

Health workers do not necessarily perform the activities for these outputs, but the indicators need to be monitored by them in order to assess the health infrastructure. Outputs need to be clearly linked to the indicators, the objectives they are measuring and the overall program goal. This is easily done in the form of a table. (See *Table 10 on page 59*)

For example, in Sibonele Clinic serving 12,000 people, the following table could be drawn up for a one-year period to the end of the year 200X using the target populations from Table 8.

The table below enables the facility manager to identify precise outputs in order to achieve the objectives, as measured by defined indicators.

<b>Goal: All women to have access to modern family planning</b>		
<b>Objectives</b>	<b>Indicators</b>	<b>Outputs (for 1 year)</b>
45% couple year protection (CYP)	Couple (women) year protection rate	1231 couple years of family planning (45% of 2376 fertile women)
Increase proportion of teenagers from 10% to 20% of total CYP	% CYP issued to teenagers	226 couple years issued to female teenagers (20% of the 1231 CYPs)
Issue at least 50 condoms per fertile woman per year	Number of condoms per woman per year	136,800 condoms issued (2736 women X 50)

<b>Goal: Improved environmental hygiene through toilets, water supply &amp; refuse disposal</b>		
<b>Objectives</b>	<b>Indicators</b>	<b>Outputs</b>
Increase from 30 to 45% the # of households with a potable water source within 50 meters	% Houses with new potable water within 50 meters	480 houses with new water standpipe (3200X15%)
10% of households with a new ventilated improved latrine by 2002	% Houses with new ventilated latrine	320 houses with new toilet (3200X10%)
Increase from 70 to 80% the number of houses with covered dump by 2001	% Houses with covered refuse disposal	320 new covered dumps (3200 x 10%)

Table 10: Linking outputs, indicators and objectives to overall goals

# ROUTINE MONTHLY INDICATORS FOR PROGRAM MANAGEMENT

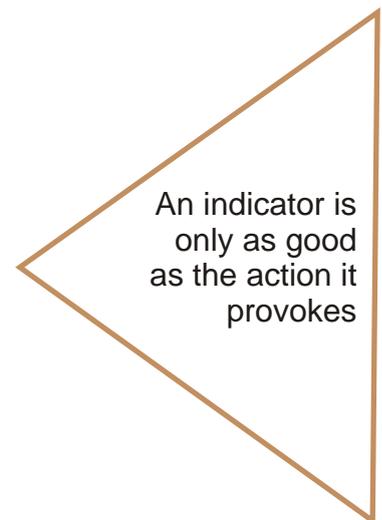
There are many indicators that can be developed for program management. There is a national minimum suggested set and each province has developed a number of additional indicators to suit their particular needs. The following list provides the indicators from the Eastern Cape Province, which is amongst the shortest in the country.

<b>Indicator</b>	<b>Numerator</b>	<b>Denominator</b>
Data input coverage	Monthly data coverage share	Constant of 1
Total PHC headcount	Total PHC headcount	Constant of 1
Supplies/drugs out of stock	Supplies/drugs out of stock	Number of items monitored (constant)
Utilisation rate (Annualised)	Total PHC headcount	Target population
Utilisation rate under 5 years (Annualised)	PHC headcount under 5 years	Target population under 5 years
Nurse clinical workload	Total PHC headcount	Nurse clinical working days
Antenatal coverage	First antenatal (booking) visits	Expected deliveries in target population
Antenatal visits per antenatal client	All antenatal visits	First antenatal (booking) visits
Tet Tox coverage of pregnant women	Tet Tox 3rd/booster doses pregnt women	Expected deliveries in target population
Tet Tox protection rate for antenatal clients	Tet Tox 3rd/booster doses pregnt women	Antenatal clients (first visits)
Delivery coverage at institutions	Births in health facility	Expected births per month
Low birth weight rate	Live births under 2500g	Live births
Delivery rate to women under 18 years	Deliveries to women under 18 years	All deliveries (live births + still births)
Women Year Protection Rate (Annualised)	Contraceptive Years dispensed x 12	Females 15-44 years
Condom use (Annualised)	Condoms distributed	Males 15 years and older
Termination of Pregnancy referral incidence	Referred for Termination of Pregnancy	Females 15-44 years
Immunisation coverage under 1 year	Children fully immunised under 1 year	Target population under 1 year
Immunisation drop out rate (DTP1-3)	3 <sup>rd</sup> DTP-Hib Dose	DTP-Hib 1st Dose
Immunisation drop out rate (DTP3-measles1)	Measles at 9 months	DTP-Hib 3rd Dose
Measles coverage (annualised)	Measles 1st Dose at 9 months x 12	Target population under 1 year
Weighing coverage (annualised)	Children under 5 years weighed x 12	Children under 5 years
Not gaining weight under 5 years rate	Not gaining weight under 5 years	Children und 5 years weighed this month
Diarrhoea incidence under 5 years	Diarrhoea cases under 5 years - new	Target population under 5 years
Severe malnutrition under 5 years incidence	Severe malnutrition under 5 years - new	Target population under 5 years
Malnutrition treatment rate	PEM clients under 5 years	Population under 5 years weighed
Lower respiratory Infection rate under 5 years	Lower resp infections und 5yrs - new	PHC headcount under 5 years
Reproductive tract infection incidence	All cases treated as STI - new	Target population 15 years and older
Male urethral discharge incidence	Male urethral discharge cases - new	Males 15 years and older
STI contact tracing rate	STI contacts treated	STI contact slips issued
Mental health case load	Mental health visits	Total PHC headcount
Violence against women incidence	Violence against women - new	Females 15 years and older
Psychiatric illness prevalence	Psychiatric illness visits	Target population 15 years and older
Chronic care case load	Chronic care visits	Total PHC headcount
Diabetes mellitus prevalence	Diabetes mellitus visits	Target population 45 years and older
Hypertension prevalence	Hypertension visits	Target population 45 years and older
Epilepsy prevalence	Epilepsy visits	Total target population
Tuberculosis treatment prevalence	TB patients currently under treatment	Target population
Suspected TB rate	Suspected TB sputum sent	PHC headcount 5 years and older
Suspected TB incidence	Suspected TB cases with sputum sent	Target population 12 years and older
DOTS rate	TB cases under DOTS supervision in facility or community	TB cases under treatment (in register)
Minor ailments rate	All other curative cases	Total PHC headcount
Referral rate to doctor	Referred to doctor	Total PHC headcount

## Other indicators

The indicators presented on the previous page are the standard *provincial* indicators developed for the Eastern Cape Province, using the data from the monthly PHC report. These provide measures of each program area and assist in visualising progress or its absence. Several of the Regions (now C level municipalities) of the Eastern Cape Province have made additional indicators providing greater detail, for example: all contraceptions, pregnancy and delivery indicators separate women under and over age 18 years to track adolescent fertility. TB case finding and outcome data are recorded monthly for more rapid managerial response. Management teams may want to identify additional indicators and are encouraged to collect additional data, provided it is needed to make decisions and that precise indicators can be calculated to suit needs.

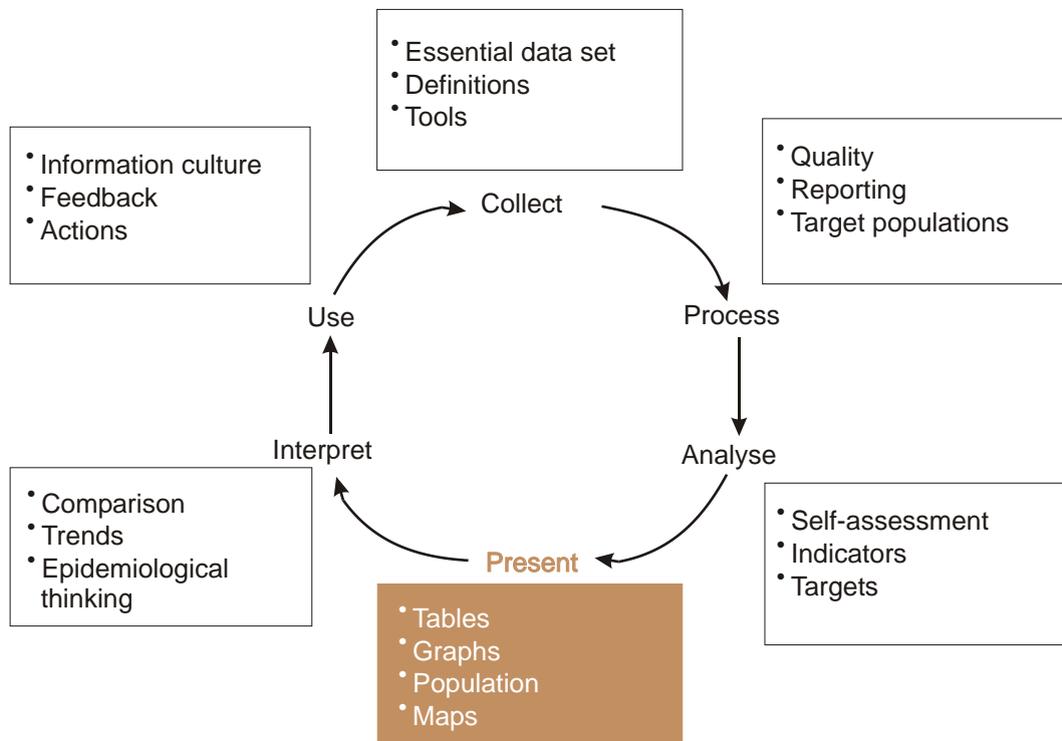
Appendix A includes a detailed listing of 17 indicators and provides for each: definitions, targets, calculation formula identifying both numerator and denominator, rationale for its use, data source, common mistakes or errors in calculations, actions to consider, other possible indicators reflecting on the same service or condition and examples of graphs or other indicator display. Such a detailed guide to each indicator facilitates its use in decision-making and assures proper interpretation and action.



# Chapter 5

## The Information Cycle: Presenting Data

### The Information Cycle



Data needs to be analysed and displayed to be functional for you as a manager. The indicators are nice to have, but to make them really useful you need to display them in the form of tables or graphs that can be readily seen and understood and discussed at all health service gatherings and community meetings.

## TABLES: SAYING IT WITH FIGURES

Tables show figures as cells in a spreadsheet format and enable you to compare your facility over time or against other facilities. They are easy to make, especially using computers, but difficult to use, especially if they are big. Columns of figures can be intimidating and are often a struggle to understand.

### Data tables

Every month your DIO should send you a computer printout data table that is identical to the monthly data you have sent to the district. You need to check that the information on the data table is the same as what you sent in on the monthly PHC report. This is the basic feedback you should insist on receiving on a monthly basis. Receiving this information enables you to make sure that the same data you sent is entered in the district computer. This table is too detailed to post on the wall, for it contains all your submitted data without indicators - just raw data - but it is useful for quality checking.

**Routine Raw Data For**

**OrgUnit 4: ec Nelson Mandela Local Service Area**

**OrgUnit 5: ec Motherwell NU 8 Clinic**

	No
PHC Headcount under 5 years	1
PHC Headcount 5 years and older	2
DOTS visit - facility	3
Number clinical work days (PHC)	4
First antenatal visit	6
Follow-up antenatal visit	7
Tet Tox Streptococci dose to pregnant wa	8
Coral pitteyote	13
Nurse rate injection	14
Hepa-provera-Patogen injection	15
Condoms distributed	17
Diarrhoea under 5 years - new	19
Lower respiratory infection under 5 years	20
Chills under 5 years weighed	21
Not gaining weight under 5 years	22
Severe malnutrition under 5 years - new	23
PEM client under 5 years	24
DTP Hib 1st dose	26
DTP Hib 2nd dose	27
DTP Hib 3rd dose	23
OPV 1st dose	29
OPV 2nd dose	30
OPV 3rd dose	31
HepB 1st dose	32
HepB 2nd dose	33
HepB 3rd dose	34
Messico 1st dose at 9 months	35
Immunised fully under 1 year - new	38
Messico 2nd dose at 18 months	37
Site treated TB case	38
TB patient under treatment	39
TB patient on DOTS - Facility	40
TB patient on DOTS - Community	41
Case treated as STI - new	42
Male urethral discharge - new	43
STI contact exposed	44
STI contact treated - new	45
Mental health visit	46

	2001 Jan	2001 Feb	2001 Mar	2001 Apr	2001 May	Total
PHC Headcount under 5 years	1178	1166	1130	1188	1052	5754
PHC Headcount 5 years and older	11975	11167	13008	10865	10254	57273
DOTS visit - facility	2940	2418	3906	4140	1053	14457
Number clinical work days (PHC)	192	207	237	254	181	1061
First antenatal visit	151	36	27	22	47	283
Follow-up antenatal visit	104	85	97	68	80	434
Tet Tox Streptococci dose to pregnant wa	44	28	27	64	25	188
Coral pitteyote	102	158	141	160	144	593
Nurse rate injection	929	405	538	476	472	2480
Hepa-provera-Patogen injection	500	393	528	328	291	2050
Condoms distributed	2000	2000	3000	1000	2500	10500
Diarrhoea under 5 years - new	6	47	7	1	4	65
Lower respiratory infection under 5 years	5	8	8	66	31	85
Chills under 5 years weighed	1178	1166	1188	672	920	4711
Not gaining weight under 5 years	30	20	22	27	22	121
Severe malnutrition under 5 years - new			7			7
PEM client under 5 years	30	20	27	27	22	126
DTP Hib 1st dose	77	55	52	88	40	242
DTP Hib 2nd dose	71	29	35	62	35	223
DTP Hib 3rd dose	72	55	45	66	29	240
OPV 1st dose	77	55	52	88	40	242
OPV 2nd dose	71	29	35	62	35	223
OPV 3rd dose	72	55	45	66	29	240
HepB 1st dose	77	55	52	88	40	242
HepB 2nd dose	71	29	35	62	35	223
HepB 3rd dose	72	55	45	66	29	240
Messico 1st dose at 9 months	63	25	36	54	19	197
Immunised fully under 1 year - new	63	25	36	54	19	197
Messico 2nd dose at 18 months	66	29	52	66	25	238
Site treated TB case	64	71	37	42	46	260
TB patient under treatment	194	197	199	207	258	1090
TB patient on DOTS - Facility	147	157	164	164	184	816
TB patient on DOTS - Community	47	40	35	43	49	214
Case treated as STI - new	412	243	264	218	337	1494
Male urethral discharge - new	19	68	50	17	71	245
STI contact exposed	275	90	150	115	90	707
STI contact treated - new	12	55	56	39	122	337
Mental health visit	1					1

Very low!

low!

Fewer than 70% per client?

**Table 11: Monthly report summary**

### Activity

Look at the tables and check each data element individually for: correctness, completeness, range and consistency.

Correctness	Are all figures accurate? The same as your paper report?
Completeness	Is the data in the table the same as the reports you have submitted to the district? Are all elements there?
Max/Min range	Is the data within the maximum and minimum ranges you have set? You should have set these max/min ranges with your supervisor and they should be printed out in the table.
Consistency	Is the data each month approximately in the same range as the months before? How does it compare to the same period last year?

Inform your supervisor and the DIO if the computer printout is different to the report you sent. Mark the table with the correct figure and send it back immediately, with an explanatory telephone call or note if possible.

Tables need to be “polished” so that the figures are simple, make their point clearly, and allow recipients to draw the conclusions that you want them to draw. Thinking about the way tables are presented ensures that data is easily available when you want it.

The best way to use them is to “eyeball” them for patterns, to assess quality, to pick up outliers or gaps, to look for trends over time, and to compare different units. Each table should contain only a few (say four to five) rows of data, all in a related category. These can be done easily from DHIS pivot tables by choosing a single “category” and displaying the data by month.

Eastern Cape - Monthly Facility Indicators 2001 (excluding drugs/supplies out of stock)											
DistShort	(All)										
Location	(All)										
Authority	(All)										
OrgUnitCategory	(All)										
RuralUrban	(All)										
MagShort	(All)										
OrgUnitType	(All)										
FacShort	(All)										
Period	(All)										
Sum of CalcFac				ReqSh							
Order	Category	IndicatorShort	IndicatorType	Amatole Mun	Western Mun	C Hani Mun	O Tambo Mun	Ukhahlamba Mun	N Mandela Metro	A Nzo Mun	Grand Total
16	Attendance	Nurse clin workload	Units	25.9	35.9	17.6	21.7	28.1	39.5	20.1	25.8
17	Attendance	Nurse wload adj DOTS	Units	25.3	31.9	16.7	21.5	27.6	31.3	19.9	23.9
61	Child Health	Weighing coverage yy	%/12 mths	106.2	136.7	102.3	97.9	122.1	131.5	85.6	106.2
62	Child Health	Not gain weight rate	%	3.5	4.1	4.6	2.4	2.7	1.5	2.0	2.9
63	Child Health	Diarrhoea incidence	Units/1,000	6.7	8.2	7.8	12.7	12.6	4.6	5.9	8.7
65	Child Health	Severe malnu rate <5	%	0.6	0.3	0.4	0.9	0.1	0.1	0.6	0.5
66	Child Health	Mainut treatm rate	%	6.2	4.9	7.8	3.4	5.6	2.8	4.3	4.8
67	Child Health	LRI rate <5	%	4.4	3.4	5.1	6.1	8.1	5.3	2.8	5.1
71	Curative Services	Repr tract inf incid	Units/1,000	4.2	3.2	3.1	3.5	3.9	6.6	3.0	4.2
72	Curative Services	Male ure disch incid	Units/1,000	1.0	0.8	0.8	0.9	1.0	1.1	0.5	0.9
73	Curative Services	TSTI tracing rate	%	36.0	33.8	29.4	39.1	39.5	43.5	47.8	38.2
111	Curative Services	Minor ailments rate	%	51.4	39.2	46.3	50.1	40.1	55.5	47.3	49.7
116	Curative Services	Ref to doctor	%	3.2	10.5	2.9	4.4	3.6	1.9	6.1	3.8

Table 12: Eastern Cape Province monthly facility indicators

## Indicator tables

A more useful form of feedback is a table of monthly indicators for your facility that shows you the indicators for various programs at your facility.

### Activity

Visually scan each indicator, program-by-program, month-by-month and check:

Consistency	Are the indicators similar over the period covered in the table?
Completeness	Do the indicators reflect the activities carried out by your facility?
Common sense	Are the indicators in the normal range, near the target set for the facility?

Indicators can also be grouped on the DHIS software by “category” to bring related indicators together on a “pivot table” printout. The Report Generator can group both raw data and indicators in any order you choose, again making related information easier to see and interpret. You can make a table on the wall recording the value of key indicators month to month.

## GRAPHS: TALKING WITH PICTURES

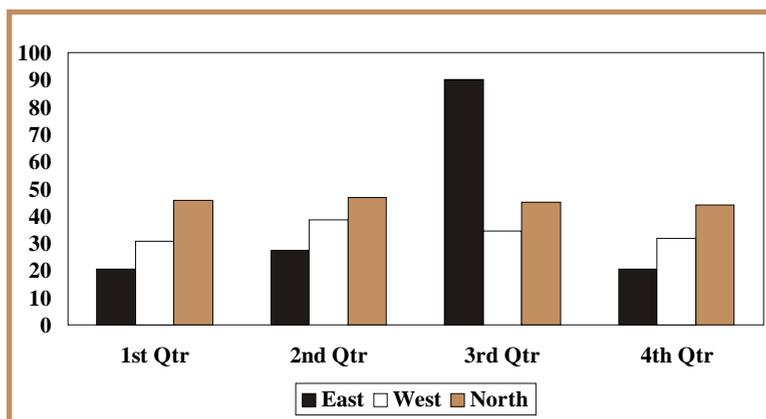


Figure 31: Graph example

Graphs are a very important way of making sure that information is fully understood, as it is easier to get a point across visually than with a mass of figures. Graphs should tell a story by themselves and are essential at facility level (and all other levels) to:

- Summarise data
- Detect trends over time
- Search for patterns among large amounts of data
- Analyse the relationships between variables

Graphs are usually hand drawn at facility level and the activity of drawing graphs is a useful team-building exercise that enables meaningful discussion with the whole facility team. If you have trouble drawing graphs, ask your supervisor to help you. This is their responsibility!

Graphs should show all important activities of the facility and if they are prominently displayed on the wall of the facility they allow both staff members and the public to see at a glance how well the facility is performing its services.

### Golden Rules for Graphs

- Hand-drawn graphs are the best they show that the team understands and cares about the data.
- Never put too much information on the graph. Keep it clear and simple: usually one indicator on one graph.
- Never mix different activities: stick to one group of people or diseases or services.
- Label your graph: always have a clear heading, easily read labels on the axes, and a legend which explains each of the lines or bars.
- Select scales that fill the entire graph on both axes.
- Where possible, show a target line or reference point to show where you are aiming.

The most useful graphs are hand-drawn by facility staff

## Types of graphs

There are four main types of graph used in the DHIS, each of which is displayed in the indicator table section and in examples throughout this manual:

- Line graphs
- Cumulative coverage graphs
- Bar graphs
- Pie charts

### Line graphs

These are the easiest graphs to draw, with data plotted as points joined to form a continuous line. The X-axis (across) is usually time and the Y-axis (vertical) is the variable. Line graphs are used to show patterns or trends of related activities over time and are useful if more than one data item is to be displayed.

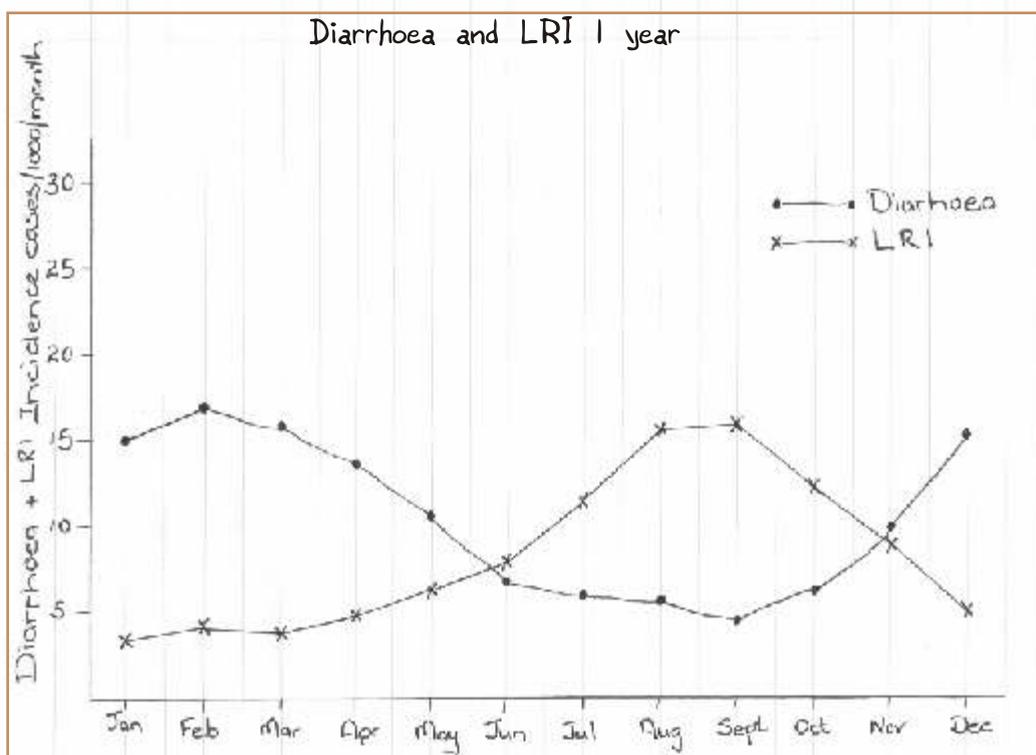


Figure 32: Line graph showing incidence of diarrhoea and lower respiratory infection

The features of line graphs can be summarised as follows:

Advantages	Disadvantages
Easy to construct and understand	Can be confusing if too many lines are drawn
Good way to make comparisons over time	Total figures are not shown

## Cumulative coverage graphs

Cumulative coverage graphs show progress towards a fixed target each month. The activities for the month are added to the cumulative total of the preceding months and this total is compared to the target line to see whether the target is being reached.

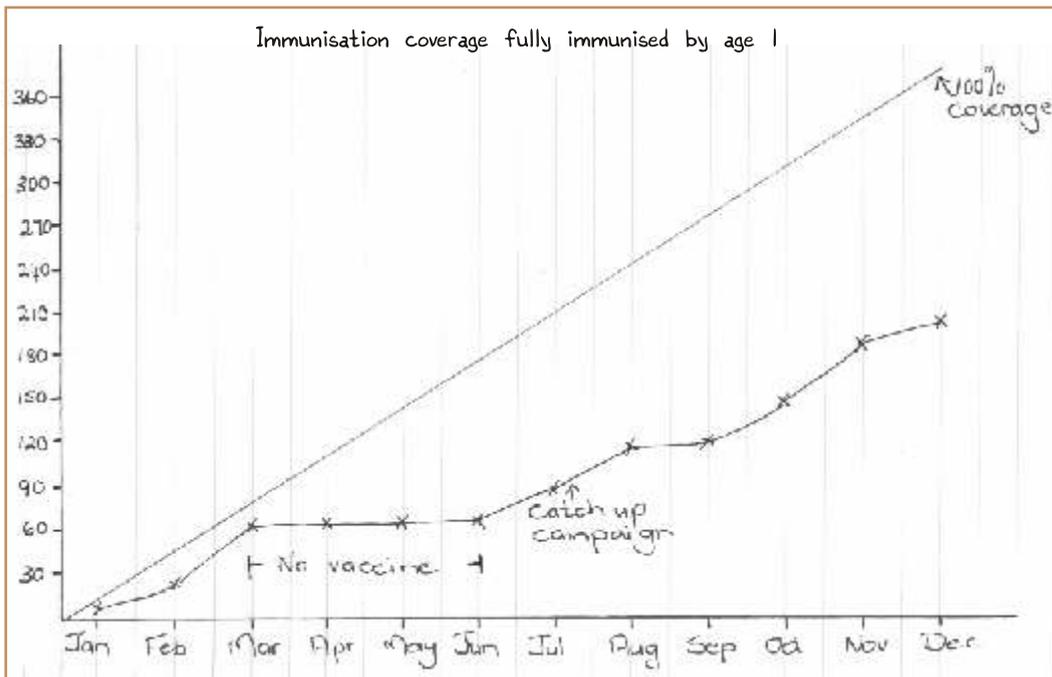


Figure 33: Cumulative immunisation coverage

Advantages	Disadvantages
Slower progress over time	Requires monthly addition
Shows total accomplishment	Confusion between #s and %s

## Bar graphs

Bar graphs are used to compare different facilities or unrelated activities. Use separate bars to correspond to the size of the groups being shown.

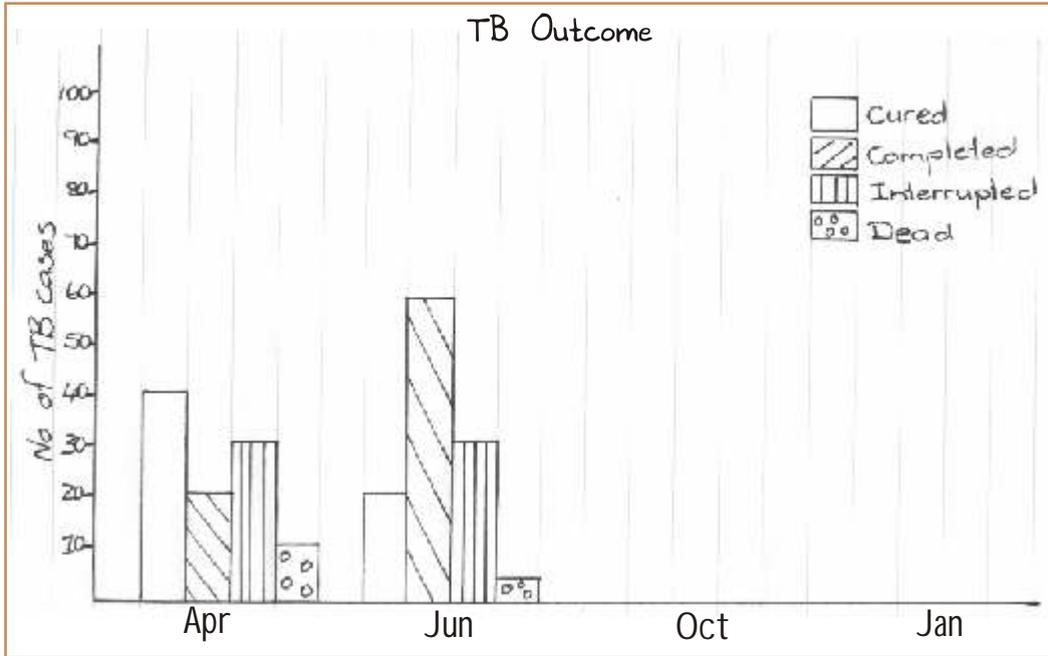


Figure 34: Bar graph comparing TB outcomes

Once you have mastered the simple bar graph, try your hand at stacked bar graphs in which the components of the graph are “stacked” on each other.

Advantages	Disadvantages
Easy to draw each month	Cumulative total
Easy comparison and trends	Many items confusing

## Pie charts

Pie charts show the proportions of an activity as part of the whole (like the slices of a pie). To draw them, get the figures expressed as a percentage of the whole and then calculate the angle needed by multiplying by 360. Draw the circle and then draw in the angles as calculated.

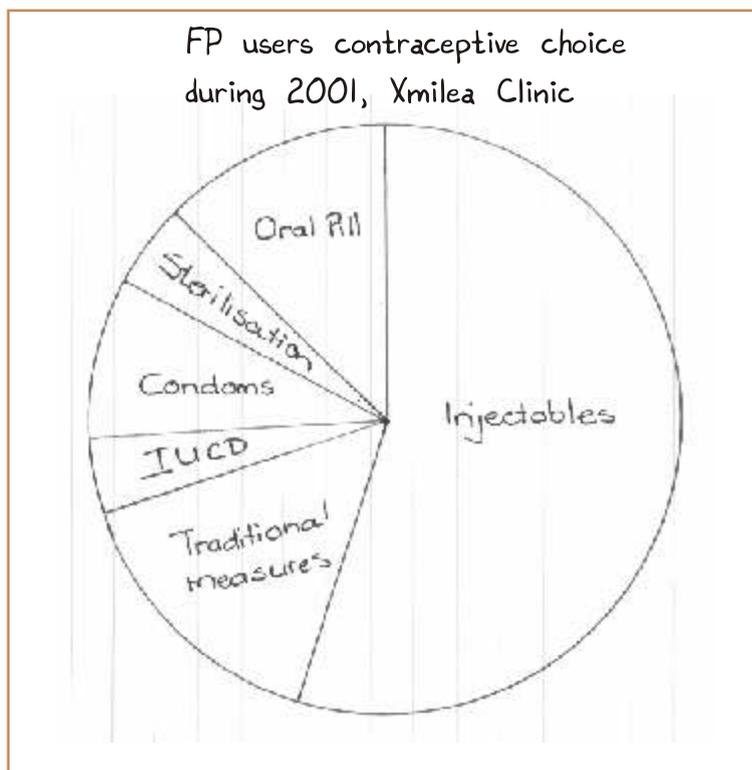


Figure 35: Pie chart illustrating choice of contraceptives

Advantages	Disadvantages
Shows the 'whole' at a glance	Difficult to plot angles
Size relates to importance	No change in time

## A set of graphs for a facility

Each facility should have a set of graphs which concentrates on its special programs and shows the coverage and quality of the integrated, comprehensive services provided.

### Monthly graphs for a facility

This set should include most of the following, but it is not necessary to start with them all at once. Select one graph from each program area to start with, draw it for the past year using existing data, and get it looking right. Then start a set of graphs (also one per program) to continue for the rest of the year, filling in the data each month before the report is sent.

Before long, you will find those few graphs so useful and interesting that you will start more graphs, different graphs and better graphs! By the end of the year, your wall will be covered with colourful graphs and charts and you will wonder how you ever survived without them!

Program	Graph showing:
<p><b>Maternal health</b> Maternal health graphs show all the services provided by your facility to the women of the catchment area.</p>	<ul style="list-style-type: none"> <li>• Antenatal care - % coverage, average number of visits</li> <li>• Deliveries - % facility coverage, % under trained supervision, % by TBAs</li> <li>• Family planning - % CYP coverage, proportion by different methods</li> <li>• Tetanus Toxoid - % coverage</li> </ul>
<p><b>Immunisation</b> The immunisation services provided to children under one year can be shown.</p>	<ul style="list-style-type: none"> <li>• Fully immunised children &lt;1 year - % coverage</li> <li>• Drop out rate between DPT1 and measles</li> <li>• Daily fridge temperature</li> <li>• Days that any vaccines are not available</li> </ul>
<p><b>Nutrition</b> Nutrition activities can be shown with a single bar graph that shows monthly.</p>	<ul style="list-style-type: none"> <li>• Percentage of children not gaining weight</li> <li>• Percentage of newborn babies weighing under 2,500 grams</li> <li>• Number of children newly found who are severely malnourished, ie with kwashiorkor/marasmus, or under the 60 percent of expected weight</li> </ul>
<p><b>Communicable diseases</b> Seasonality or unusual numbers comprising early evidence of an epidemic.</p>	<ul style="list-style-type: none"> <li>• New cases of diarrhoea, acute respiratory infection and measles, as well as other local priorities. (Schistosomiasis, malaria, etc)</li> <li>• Numbers of houses sprayed</li> </ul>
<p><b>Curative care</b></p>	<ul style="list-style-type: none"> <li>• Proportion of those coming for curative care that are children</li> <li>• Proportion of all patients treated for minor ailments</li> </ul>
<p><b>Sexually transmitted infections</b></p>	<ul style="list-style-type: none"> <li>• Rate of penile urethral discharge amongst males - an indicator of STIs in the population</li> <li>• Contact tracing rate</li> </ul>
<p><b>Tuberculosis</b></p>	<ul style="list-style-type: none"> <li>• Smear conversion rate at 2-3 months</li> <li>• Suspect TB, TB cure, interruption, success rates</li> </ul>
<p><b>Administration</b></p>	<ul style="list-style-type: none"> <li>• Nurse workload</li> <li>• Population utilisation rate</li> <li>• % Drug stock out</li> </ul>

**Table 13: Example of different types of graphs possible for different programs in a health facility**

Examples of these graphs can be found in Appendix A.

## Half-yearly or annual graphs

Every year, it is useful for you and your team to assess the bigger picture and to look closely at changes in situation, through an annual evaluation. This can coincide with the annual survey, when you have to organise your statistics in any case.

What you choose to look at is up to you, but in addition to the graphs previously shown, you might care to look more closely at quality, risk and management issues. Use your imagination, involve the whole team and have some fun doing research! Some areas to assess include:

- Analyses of patients' age, gender, place where they come from (pies and maps)
- Review quality of diagnosis and treatment ... do a sample of your register to show that patients are treated according to standard guidelines (pie graph)
- Are your patients happy with the services provided? Ask them as they leave and graph it! (bar graph)
- Show proportion of all curatives who are chronic, minor ailments, STI, mental health, DOTS, others (pie graph)
- Show breakdown of chronic cases into hypertension, diabetes, chronic lung disease, cardiac, etc. (pie or stacked bar graphs)
- Staff absenteeism or workload (graphs)
- Community data: update your map or locate houses without water or latrines. Where are your TB cases? Are they in a few common areas?

## PRESENTING THE POPULATION

Just having population figures, even in table form, is not good enough for facility managers. Each facility needs to make diagrams of their target populations so that all staff members and the community can easily understand the services to be provided. There are a number of ways to present this information.

### Population pyramid

The most common way of presenting populations is a diagram using a population pyramid, which groups the population according to gender and age, in five-year groups. Typically, a poor population with high fertility, and high mortality (especially amongst the youngest ages) is broad at the base and rapidly gets smaller towards older ages. Where maternal mortality is high, females are found in smaller numbers than males, but young males have higher rates of mortality due to violence and accidents. Figure 36 depicts such a pyramid for Region E, in the former Transkei of the Eastern Cape Province, a poor rural area. The pyramid from Region A, in the former Republic of South Africa, which is richer and more urbanised, shows that as fertility declines, mortality too decreases. The pyramid becomes narrower at the base and fat in the middle, reflecting also the migration of working age adults into the population as seen in Port Elizabeth, an urban area. Finally, in a "mature" and well off population, such as in Norway, the pyramid becomes almost uniform as the numbers born remain steady through the years and nearly everyone born gets to live to old age. The pyramid is like a uniform column.

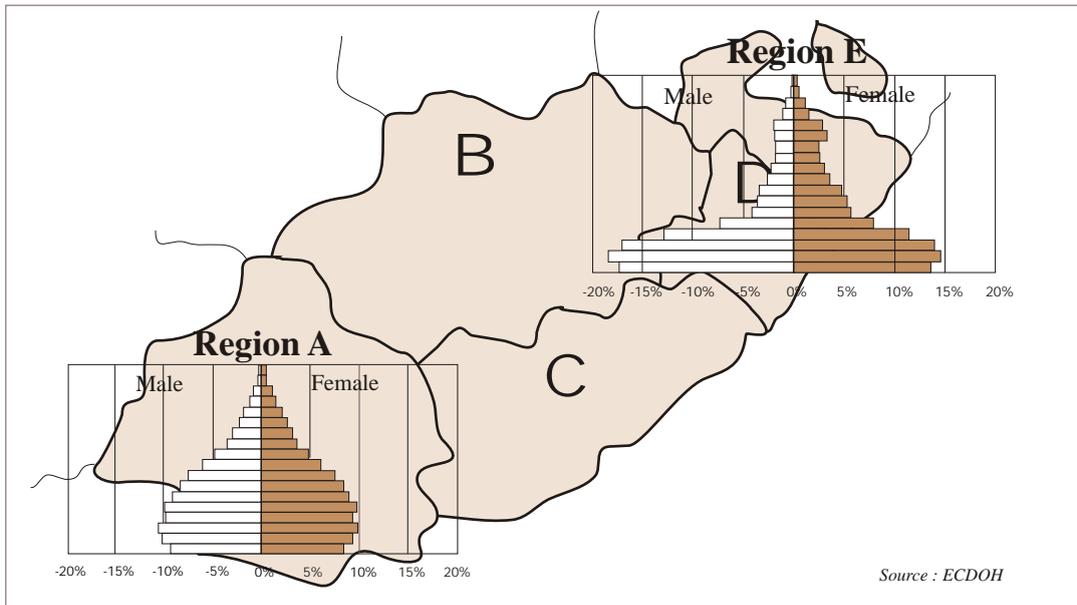


Figure 36: Population pyramids in two regions of the Eastern Cape Province (1999) depicting age groups by gender

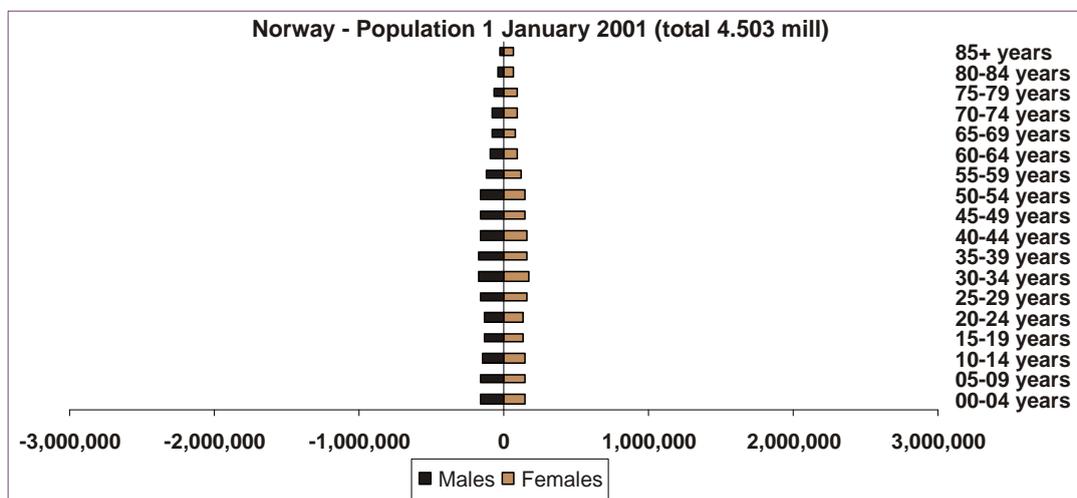
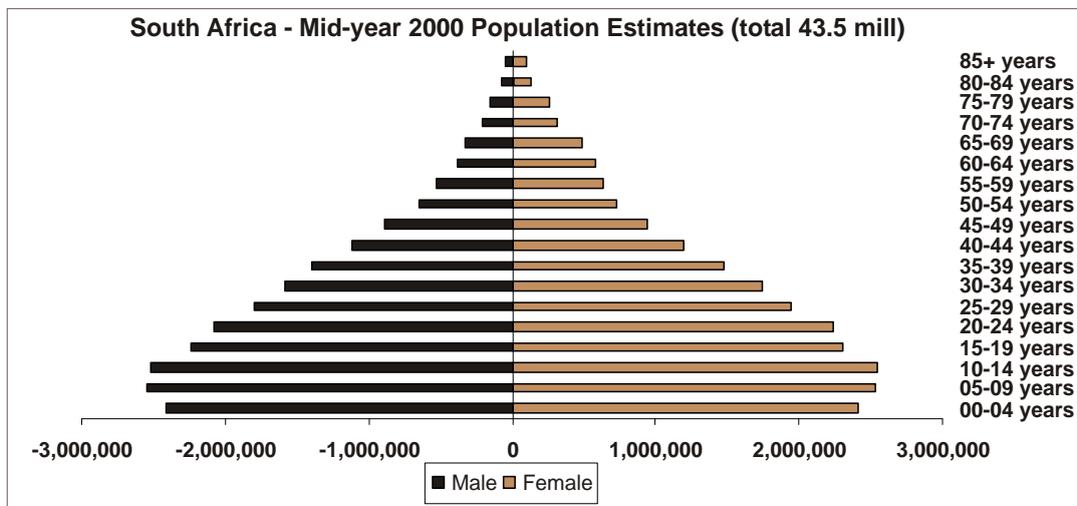


Figure 37: Population pyramids for South Africa and Norway

The rural population has a completely different shape than the urban population. The pyramids show that in rural areas, more children are born, but they die faster and once they reach adulthood, they leave the rural areas to look for work, especially the males. There are therefore more female adults in the rural areas than in the urban areas, and many more old people.

### Activity

Draw a population pyramid for your own magisterial district using DHIS population figures (pyramids of smaller populations are too erratic to provide reliable shapes to interpret). Discuss the different shapes you see and what that means for health services serving those areas.

## Population pie

Populations can also be represented in the form of a pie chart, which shows the data in an easily understood graphical form. The total population is shown as the full circle (the pie), and the target populations are shown as a part of the circle (slices of the pie). Each district, and even sub-district, will have slightly different percentage of the population in the different target groups, so the population pie will look slightly different.

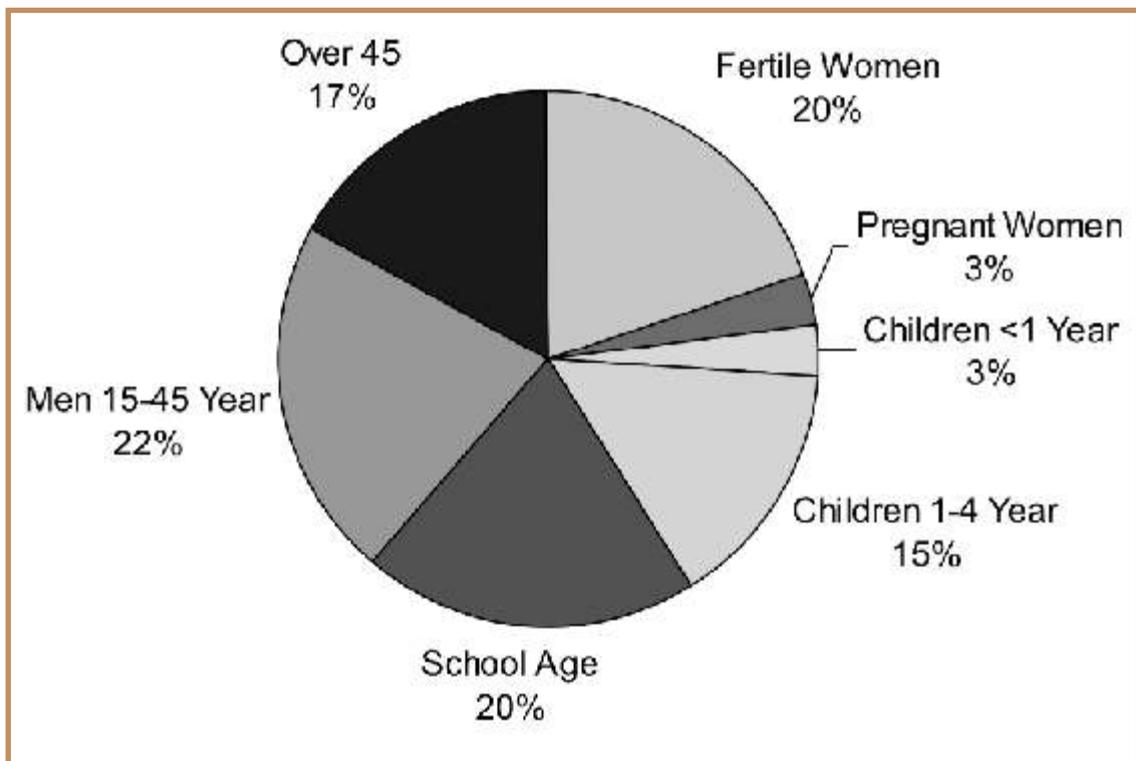


Figure 38: The population pie

## Activity

Draw a pie diagram of the population your facility serves, using the proportions calculated in the population tables. Ask your supervisor to help if you have trouble drawing a pie chart.

## THE FACILITY MAP

A map is an essential tool to enable health staff understand the area around the facility and the population they are serving. The manual “Mapping for Primary Health Care” produced by the EQUITY Project details the mapping process. This process is summarised in the following 15 steps.

### 12 Steps for a rural map

#### Step 1

Organise a meeting of the clinic team, include clinic staff, the community health committee, the environmental health officer, and community health workers. Invite members of the district health management team if possible. Ensure that the meeting includes persons who would be able to describe where most patients came from, and people who know the names of communities and localities.

#### Step 2

Discuss the purpose of the mapping:

- To gain information about communities, their environment and use of services;
- To locate on a map features which are related to health of the community;
- To determine all the communities from which patients come to the clinic;
- To estimate the population served by the clinic and then to determine coverage rates of services. For example, percent of infants fully immunised each year;
- To understand the geographical and other factors which make access to the clinic difficult;
- To use the information in future work. For example, an investigation of outbreaks or participation in community activities.

#### Step 3

Read the sheet of notes and definitions before starting to fill in the form (Appendix D).

#### Step 4

List all localities on the form and complete all columns.

## **Step 5**

When the clinic is not very busy - over the lunch hour - extract the names of localities and number of patients attending from each area during the last complete month. Count the total and count the number attending from each locality and work out percentage of the total who come from each place. Two months is preferable and even better would be extraction from one dry month and one wet month. Two people should work together: one reading out the address of each patient while the other ticks it off. When community members are present, be careful not to mention patients names but only addresses.

## **Step 6**

List the names of localities thought to contribute most patients on the form and the names of localities from which large numbers of patients (or greater %) actually came. These constitute the greater part of the catchment area.

## **Step 7**

Try to identify these places on any printed large scale map you have already obtained.

## **Step 8**

If the area is hilly, walk to a high area with knowledgeable local people (e.g., the clinic watchman, a teacher, or a nurse) and get them to point out where the localities are situated. If there is a central road drive up and down it to determine where villages (localities) are.

## **Step 9**

Draw these on a map with the clinic in the middle, north at the top, east on right, west on left and south at the bottom. Put in roads and indicate distances - from where to where. Put in names of localities and schools, shops, roads and other identified places.

## **Step 10**

When census maps and the population census are available, draw the catchment area again more to scale and write the population for each village.

## **Step 11**

Discuss your map with clinic staff and with the community/clinic committee. You might want to sketch in corrections and changes, and when you feel you have the entire area portrayed on the map, sketch a "final version" incorporating all the corrections and modifications.

## **Step 12**

Make sure you fix the map on the wall in a permanent place in the clinic.



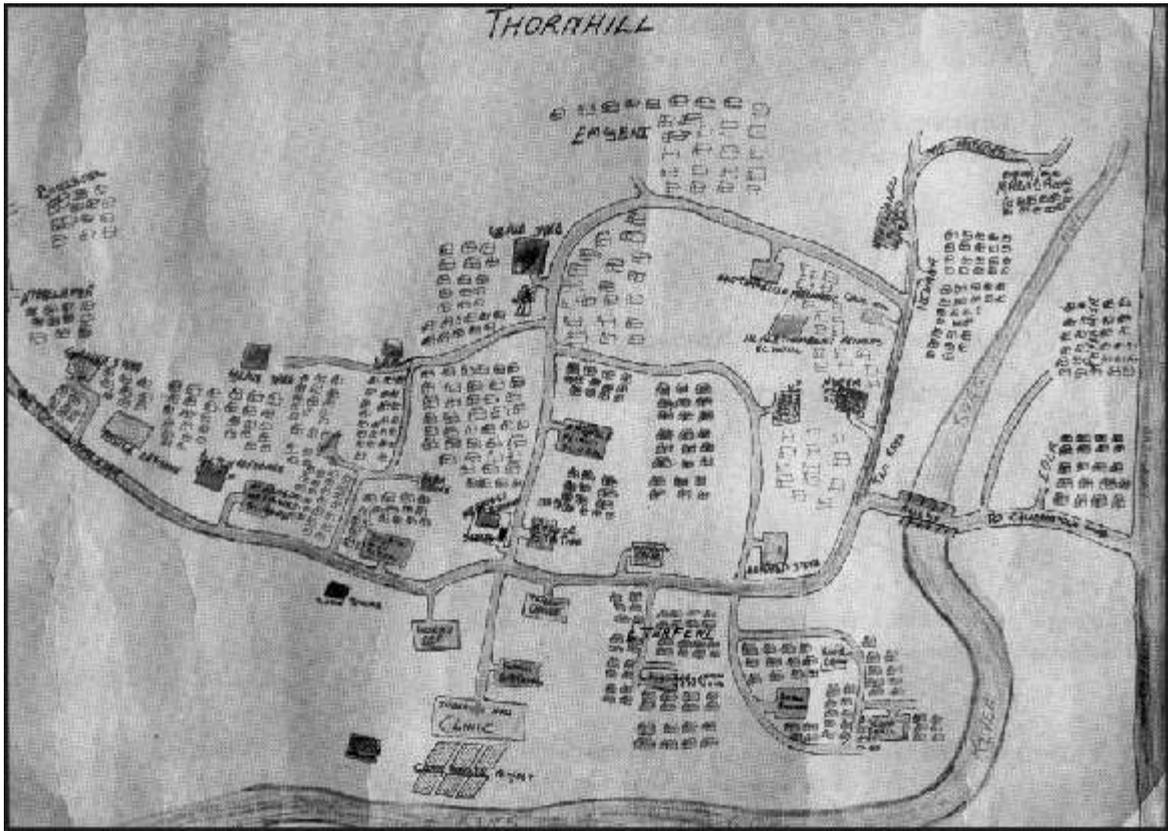
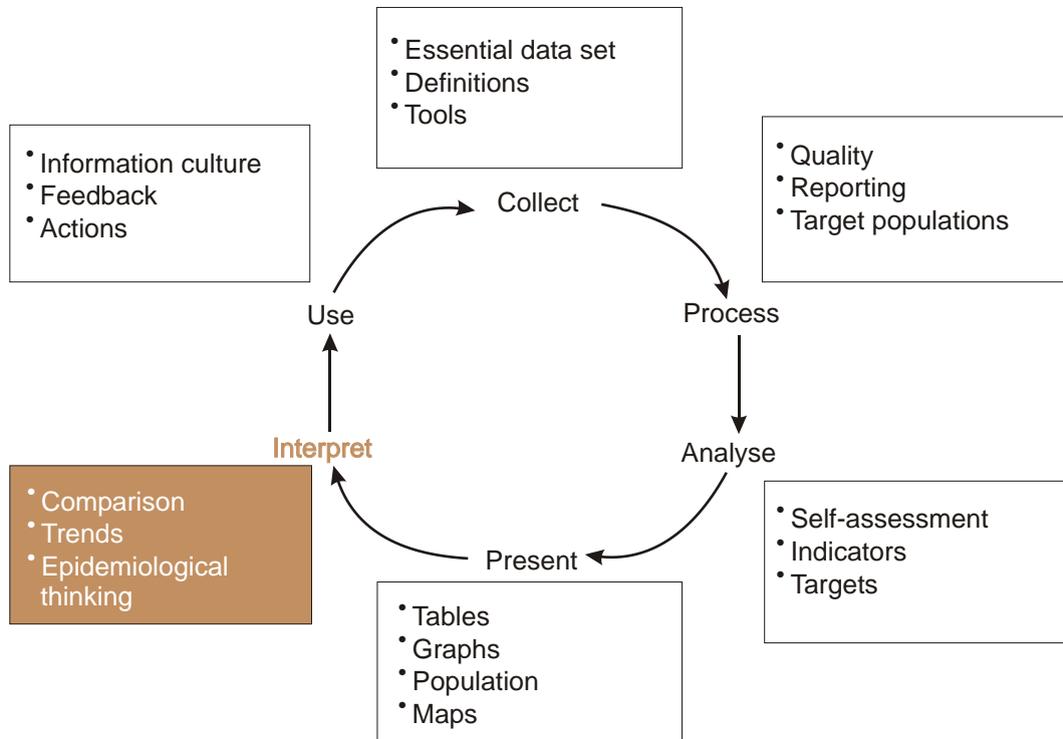


Figure 40: Thornhill Clinic catchment area, Queenstown District

# Chapter 6

## The Information Cycle: Interpreting Information

### The Information Cycle



Interpretation of the information at your disposal is one of the most important and most difficult aspects of using the information system. It is an integral part of a continuum of analysis, presentation, and use, and should not be formally separated from them, though they are separate in the cycle. Interpretation should bring together routine information from other sources and good, old-fashioned “common sense”.

As a manager, you need to assess your progress towards the goals you have set yourself and to apply epidemiological thinking to the results you see. You also need to compare your activities to past activities (trends) and compare to other similar institutions.

The most useful aspect of the DHIS is that it brings together different kinds of information and enables you, the health workers, to see how well you have done in your own work. You can assess yourself and your team against criteria that you yourself have set. This is your data - use it to measure your own progress and success.

## COMPARISON

Comparison is the most important aspect of self-assessment. How am I (or my facility) doing in relation to other similar organisations?

This is the basis for the national districts competition, an annual performance review that assesses different districts according to set criteria. In a similar way, each district should identify a “best performing clinic” according to locally determined criteria.

As long as you are comparing “apples with apples” (i.e. using the same data definitions, same indicator) you can compare yourself to program targets, other facilities, or other geographic areas.

Comparison should stimulate some simple questions:

- Is our performance adequate?
- Why are we doing well (or badly)?
- What are others doing that we can learn from?
- How can we do better? Can we improve quality of care with existing resources?
- How can we be more effective or efficient?

A facility should compare itself to:

- Targets set locally and by the district
- Other facilities
- Other areas
- Norms and standards

This self-assessment introduces an element of healthy competition into your workplace and allows weaker units to learn from stronger units that are performing better.

## Comparison to targets

Whatever program you work in should have goals, targets and indicators developed so that you can ask:

- Have we met our targets? If not, why not? What should we be doing better?
- If we met **all** our targets, is it possible we set them too low? Should we be more ambitious?
- Is our estimated population far too small (making the denominator smaller makes the indicator larger)?

## Comparison to other facilities

It is always interesting to compare yourself to other similar facilities in the same district, or even in other districts:

- Are our achievements similar?
- Where have we done better? What have we done right? How can we share these lessons?
- Where have we done worse? What could we be doing better? How can we learn from them?

## Comparison to other geographic areas

Comparison between districts and regions may demonstrate substantial differences, often as a result of different conditions of the facilities or population served. In the Eastern Cape Province, Region D and E (former Transkei) facilities have fewer pharmacists and more frequent drug stockouts. They have less contraceptive protection and higher birth rates. Some of these differences can be redressed by working harder to deliver more and better services, but others require more financial resources and infrastructure investments. Geographic comparisons help identify what is possible and should motivate staff to achieve those levels of services.

## Comparison to norms

Many program areas establish “norms” or expected targets that all should strive to reach. EPI coverage of 90% of infants, TB cure rates of 85%, ANC cases of 3 visits or more per pregnancy are “normal” examples. Such uniform norms are often easy for some and nearly impossible for other facilities to achieve. But they do express the overall expectations of the higher level program managers. Some norms allow resources to be moved immediately to achieve them: if nurse workload exceeds 40-50 clients per day, another nurse should be assigned to the facility, best transferred from one where workload is less than 20 clients per nurse per day.

Similarly, for quality of care, norms are set for treatment of clients, procedures to be followed and preventive measures. Facility management should always strive to achieve compliance with these norms.

## Trends over time

Trends are a form of comparison over time. Hopefully they show service indicators approaching or exceeding the expected norms. However, they may show changing patterns of health in the catchment population; more STIs and rising HIV and TB have been seen over the past ten years. Falling teenage pregnancy is an encouraging trend associated with increased use of contraception. Rising use of oral rehydration solution (ORS) at home for diarrhoea should lead to a trend of decreasing infant and child mortality, but declining trend of exclusive breastfeeding predicts more diarrhoea cases. Look at trends and try to understand how they can be improved by your actions to result in better health indicators.

This self-assessment should not be kept to yourself. Use the results of your self-assessment to show your colleagues at other facilities, the community health fora, clinic committees, the district management team and other influential politicians and community people what you are doing. This is feedback.

**Who gets sick?**  
**What conditions?**  
**When do they get sick?**  
**Where do they live?**  
**Why do they get sick?**  
**How do the health services deal with them?**

# EPIDEMIOLOGICAL THINKING

Epidemiological thinking is the process of answering the six questions about the population we serve that was presented in the introduction. (See Figure 3 on page 5)

The key issue of epidemiological thinking is that we always relate data to a known population, which is why we have dealt with it at such length in the previous chapters.

- **Who?** Is usually answered by age, gender, race or occupation. Who are sick with a particular illness or complaint? Teenage girls? Old men? Infants?
- **What?** Are some groups always prone to certain conditions? Obese people? People with chronic cough? High blood pressure?
- **When?** Are conditions seasonal? Diarrhoea, pneumonia? Or during holidays when men return home? Or when it rains? Or drought?
- **Where?** Use your map to spot clustering of cases around a common source, or a particular water supply, or a particular shebeen or “red light” area.
- **Why?** This is a little more difficult and requires you to ask patients about habits, possible exposure, diet or other factors that predispose to a particular disease or conditions. Here socio-economic conditions may need to be examined carefully.
- **How?** Do health services deal with sick people? Are they caring and compassionate? Helpful? Reassuring? What treatment do they get? Is it recommended? Followed? Do some discontinue? Are all cases found? This holds for TB, malaria and HIV, but also continuity of FP, immunisations, care of diabetes or hypertension. Can you measure continuity of care? And what do you do for those who drop out?

## Proportions, rates and ratios

These are the tools we use to measure the frequency of an occurrence. The questions above are best answered by comparing groups according to measured frequency, expressed as a proportion, a rate, or a ratio.

### Proportions

Proportion is any expression with a numerator and denominator. Usually it is less than one such as what proportion of the class is girls?

$$\text{Class has 33 pupils and 17 are girls} = \frac{17}{33} = 0.48$$

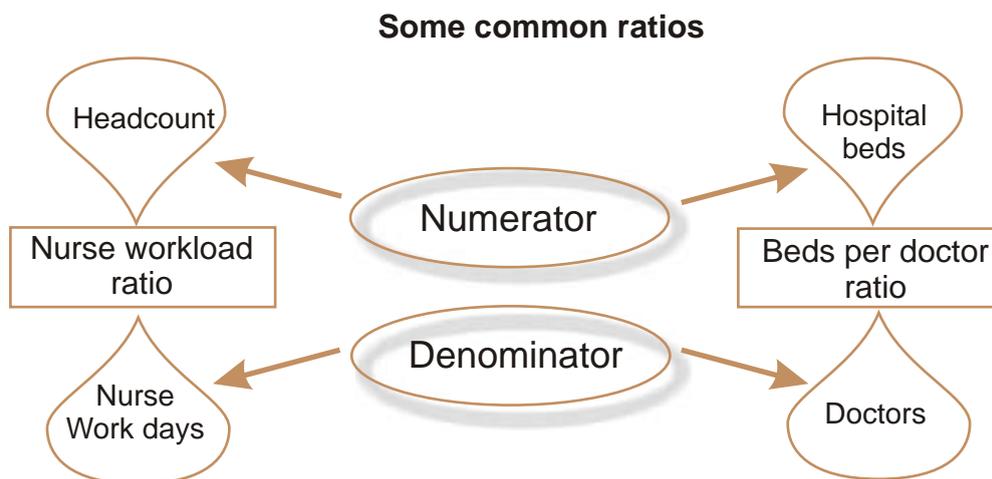
Often we multiply a proportion by a factor to express what part of 10, or 100, or 1000 etc., are in the numerator. For example, the class of 33 pupils with 17 girls, has 48 girls for each hundred pupils or 48 percent girls (*cent* is the Latin word for *hundred* - hence, *percent*; *mille* is Latin for 1000 - hence *per mille*, etc).

## Rates

If the numerator comprises a part of the denominator, the proportion is called a “rate”. For example, number of infants fully immunised divided by all infants in the population. If this rate is multiplied by 100 it makes a percentage. For diseases, we often express cases per 1,000 or, if it is very unusual, per 100,000 population. We chose the denominator size to avoid small indicators less than one. Point one percent (0.1%) of maternal mortality seems tiny, but that is the same as 100/100,000 considered an unacceptably high maternal mortality ratio. On the other hand, immunisation coverage of 85% is also 85,000/100,000, hardly a very clear way to express coverage. Choose your denominator so that the rate is usually above 10 and not over 1,000.

## Ratios

In the case where the numerator and the denominator are not the same things, we call the result a “ratio”. For example:



Measure	Definition	Examples		
		Numerator	Denominator	Standard
<b>Proportion</b>	Numerator divided by denominator	# girls	# pupils	1
<b>Rate</b>	Numerator is part of the denominator	# children attending	Total people attending	100 (%)
		# cases diarrhoea <5 yrs	Population of children <5 yrs	1,000 (per mille)
		# of new cases of TB in one year	Total population	100,000
<b>Ratio</b>	Numerator and denominator are NOT the same	Total headcount in month	Total # of days workload by all nurses	1 day
		Maternal deaths	Live births	100,000 (births)

Figure 41: Definitions and examples of proportions, rates and ratios

## Incidence and prevalence

When counting diseases in a community, we need to distinguish between **incidence**, which is **new** cases of the disease expressed over a particular time (per month, per year, etc.) and **prevalence**, which is the total number of existing cases of the disease at any time. Incidence always refers to **new cases** in a **certain period of time** while prevalence usually refers to **all the cases at any point in time**.

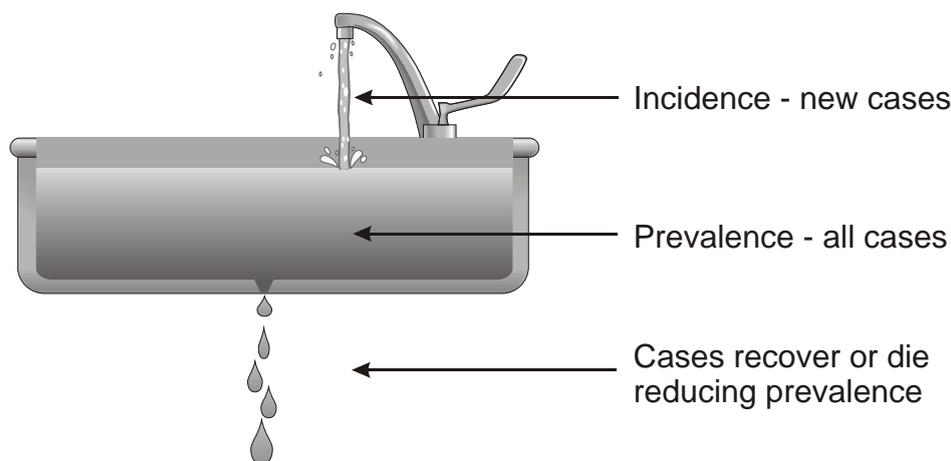


Figure 42: Schematic presentation of incidence and prevalence

Incidence of high blood pressure (HBP) (new cases) may be few each year, but the disease lasts for a very long time, so prevalence (existing cases) is high. In contrast, incidence of diarrhoea in children is very high - perhaps 300 episodes for each 100 children per year, but at any one point in time diarrhoea prevalence is low - say 5-7% on any day, as the disease is brief so few have it at any one time.

## Epidemiologic analysis

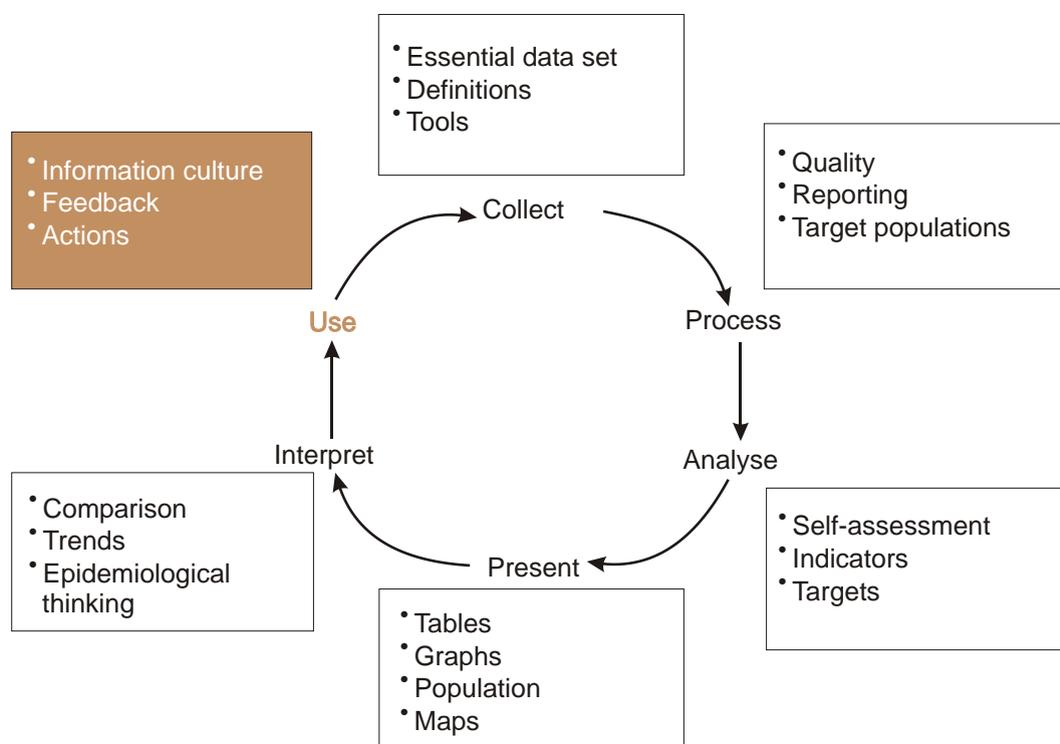
While DHIS collects only a small number of data elements, by analysing and interpreting them according to the fundamental epidemiological characteristics of **person** (age, gender, occupation), **time** (season, climate, special gatherings, holidays) and **place** (water source, attendance at festivities or parties, exposure to a sick person, or known risk places) you can often understand how to focus your efforts to prevent and control illness. Expressing these relationships as rates or ratios enables comparison of groups of people and makes data turn into real information. This is especially true when you use maps, charts and graphs to visualise your information. Then, you are ready to take effective **action**.

Information collection is not an end in itself and even the best information is useless unless someone uses it.

# Chapter 7

## The Information Cycle: Using Your Information

### The Information Cycle



Information is the centre core of the planning cycle and should provide the answers to the planning questions. However, just having information does not mean that managers will use it. Information use is made easier if its use is ritualised and routines are set up as part of the “information culture”. In other words, everything done at a facility must be on the basis of information. Every decision made, every action taken, and every change made should be guided by information coming from within the facility and influenced by outside policies, norms and regulations.

## TIMELINESS

Information must be current to be useful to managers at all levels. Informal actions can only be based on up-to-date data. Monitoring effectiveness of those actions requires immediate measurement of the results. Thus, timely submission (within a couple of days of the end of the month), rapid entry into the computer, and immediate reports provided from the standard DHIS report generator programs are critical. The Eastern Cape Policy on monthly PHC reports is summarised in the diagram on page 85 (Figure 43).

## FEEDBACK

Feedback is the communication of analysed information presented in an interesting way and interpreted in the light of local reality. If the major purpose of information is to inform the actions of potential users, then feedback is the most important mechanism to achieve this purpose. Once information has been interpreted and understood, other information users need to be informed of the interpretation.

Working Days																													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Data collection throughout the month on registers																													
Data collation and summation at end of month from all registers																													
Within 5 days: Monthly form filled and checked by facility and signed																													
Within 8 days: Form discussed with supervisor and corrections or explanations made signed/ Submit completed form to district PHC coordinator - records receipt date																													
Within 11 days: Submit all forms to District Information Manager (DIM)																													
Within 20 days: Forms entered into computer, validated, and exported to province/ As reports are entered into computer, feedback to each clinic is generated directly, given to relevant supervisor to carry back to the clinic/ DIM has prepared a list of outstanding reports and given to the DM for action																													
Within 30 days: DIM has completed feedback report to each clinic and provided direct to supervisor/ DIM has prepared specific reports for each program manager/ DIM has prepared and submitted monthly summary report to DHMT/ DIM will keep a file of reports submitted and dates given to managers and facilities/ DIM should encourage all who receive reports to visit the Info Unit to actually explore the data on the computer as active interaction (drilling down, defining a graph, using the Data Mart Report Generator tool to identify outliers etc)																													

**Figure 43: Diagram of the ECDOH PHC reporting system schedule**

## Insist on feedback

The main function of the DIO is to process information and to provide rapid feedback to supervisors, facilities and the District Health Management Team.

Feedback should also come to facilities from the other members of the District Health Management Team, the facility supervisors, hospitals supervising clinics, program managers, NGOs, and all others who analyse and interpret data.

Feedback is a basic right of health workers and peripheral staff have the right to demand feedback from their superior officers if they have sent up reports as requested. Feedback may take many forms, but it is best done in writing and discussed.

## Written feedback

1. Simple **tables of monthly data** which you have sent up, without any analysis or comment, are automatically produced by the DHIS software and should be sent back to each facility monthly. This allows the facility to check once again data accuracy and shows that the data has been entered into the system.
2. The district should produce **short program reports** each month containing selected indicators and raw data on different programs such as maternal health, child health, communicable diseases, and management issues. This may be by sub-district or for the whole district or for a single supervisor. Program-specific reports should be produced each month by the DIO and sent to each facility.
3. The district can easily print out **comparisons by facility** of service coverage, facility workload, disease incidence, cure rates, etc. These will show you how well you are doing compared to the other facilities. Usually all the facilities under one supervisor appear on a single report each month.
4. Computer generated **graphs** comparing facilities, showing district trends, identifying facilities with particular achievements or problems.
5. **Written quarterly and annual reports**, and other reports to health fora, hospital boards, clinic committees etc should be produced by the district and given to you as well.

## Standard reports

The DHIS programs contain a series of standard reports that can be printed at the push of a button. They are listed below:

Reports available from the DHIS report generator
TB smear conversion
TB case findings
TB treatment outcomes
TB integrated program
TB DOT program
Finance and administration
PHC integrated services
Human resources
Primary health care
Health promotion
Nutrition program
Sexually transmissible infections
Essential drugs and supplies
Child health
General care
Facility supervisor report
Communicable diseases and TB DOTS
Maternal and women's health
HIV and AIDS

Figure 44: Standard reports available on the DHIS Report Generator

## Special reports

In addition, the DHIS is extremely flexible by allowing modification of any report to include other elements of data, other indicators, summation over a chosen period of time, comparison with other facilities or districts, or with a similar time period in another year. Sit with your supervisor and DIO and define the specific report most useful to your facility that you would like to receive each month. The **Report Generator** of the DHIS can maintain the format of your reports and prepare them monthly.

The DHIS can prepare "exception report" listings of facilities with indicators above or below a chosen level:

- Facilities that have a nurse workload greater than 50 or under ten patients per day over a period of the last 3 months; or
- Facilities with fully immunised infants over the past 6 months or less than, say, 60% of the infants expected, or over 100%; or
- Facilities with referrals to doctor of over 20% or under 2%.

This kind of selection can be applied to any data item or any indicator and provide managers with a highly sensitive analysis of where attention is needed.

## Activity

Ask your supervisor to arrange a meeting with the DIO in front of his/her computer to demonstrate the data from your facility, the many reports that can be generated from this data, and comparisons with other facilities and districts. The computer can make graphs as well, though they are not as interesting as the ones you make yourself!

## Verbal feedback

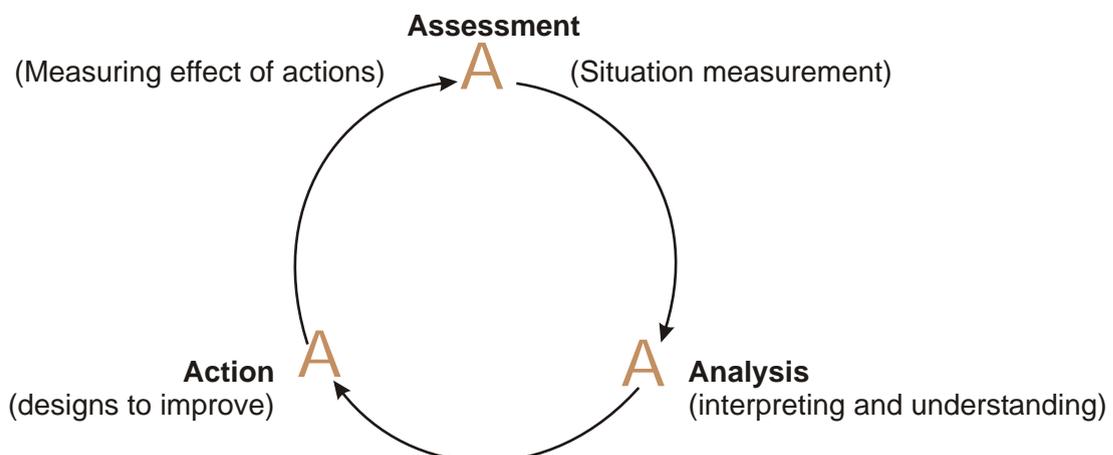
Verbal feedback within the clinic and within the local government structures is an important function of the information coordinator, together with the facility head. Each group needs specific information, which relates to their particular needs and you need to be creative to identify what is interesting for them.

Some examples of verbal feedback in which you can use the results of your self-assessment include feedback to other health workers, to health committees, to the comments and to other health-related sectors.

Health workers in other fields are often very poorly informed of what their colleagues are doing. For example, environmental health workers are often unaware of the work at immunisation clinics and staff doing school health are often not informed of work in disease control, though this shared knowledge is essential. Share reports and post them for all to see.

## Staff meetings

Staff meetings at facility level should have information as the central core of the agenda - at least an hour a month is minimal. Every month, the facility team should look at a different component of the information system and analyse graphs of achievements of targets on a rotation basis. The results are discussed and actions decided upon which are expected to improve results in the future. By the time of the next review, all will be interested to see if the actions taken have indeed resulted in the measured improvements predicted. This is the triple **A** cycle



A **rotating system**, which has been shown to work in the Eastern Cape, is:

- Month 1 MCH, including ANC, family planning, immunisation, etc.
- Month 2 Communicable diseases, including TB, STI, notifiable diseases
- Month 3 Chronics, mental health, work load, referral, drug supplies, environmental health
- Month 4 Start again with MCH

Meetings of senior staff and facility heads from a particular supervisory area should promote sharing of analysed information between facilities. In this way, strong facilities can share their successes and help other facilities to plan actions to perform better.

## Supervision

Supervision is the most important form of feedback on information. All supervisory visits should be focused on information analysis, interpretation, and action plans.

An analysis of your facility information should form the basis of any good supervision and is potentially the most important way of ensuring quality of care. The supervisor brings feedback to the facility based on previous months data, properly processed, analysed and presented. Together with the staff, information is interpreted and action plans are made to be implemented in the month ahead and assessed by the next month's data collection.

The supervisor also provides quality assurance by checking the validity of new data and assuring staff skills are up-to-date. The "Clinic Supervisors Manual" produced by the EQUITY Project, contains a detailed set of tools to facilitate this process for each element of clinic functions, enabling objective measures of problem identification and facilitating problem-solving actions to result in improved measurable indicators of success. Functions, enabling objective measures of problem identification and facilitating problem-solving actions, result in improved measurable indicators of success.

## Feedback to the community

With the strengthening of local government, the community is increasingly involved in running health services. Every facility (or town in some cases) has a community committee or forum, which ensures accountability to the broader community.

The health facility has an obligation to provide information-based feedback to these organisations to show what is being done at the facility. It is essential that these committees always be informed about activities at the health facilities particularly on administrative issues relating to finance, staff and equipment, and service provided. These bodies, supplied with well analysed and presented information, can help take actions to further support the facility as well as mobilize the community for action.

The community should be the biggest supporters of the health services, but if they are not adequately informed about the progress of Batho Pele, they can be great detractors. Health workers need to keep community members and community-based organisations informed of activities at the health facility in a timely and appropriate way, using the DHIS information. Immunisation coverage, use of FP, trends in diarrhoea, or STIs can be illustrated and discussed

**CHECKLIST: TUBERCULOSIS**

CLINIC \_\_\_\_\_ DATE \_\_\_\_\_

Tick appropriate box [✓]

Availability of services	July	Sept	Oct
Fast flow services available for TB patients currently on treatment	Y	N	
Protocols and policies available	Y	N	
• The SA TB Control Handbook (Guidelines TB)	Y	N	

**CHECKLIST: CLINIC MANAGERS**

Organization Of Services / Quality / Client Satisfaction

Tick appropriate box [✓]

2 staff Consultants	Y	N
Patients share posts? (if not language)	Y	N
Clear list of services available (with staff profile)	Y	N
Is each staff member in a timely manner?	Y	N
Consultants work in a timely manner (if applicable)	Y	N
Waiting time / backlog		
Patients not contacted		
Staff not motivated		

**CLINICAL MANAGEMENT OF ADU**

Are clinic staff doing the following:

- Identifying TB suspects
- Rec. using appropriate sp.
  - Sputum direct for new
  - Sputum culture and M
- Rec. using sputum smear
  - At least 2 months on treatment
  - After 6 months (new)
- Initiating the correct treatment
  - Newly diagnosed patients
  - Re-treatment patients
- Recording the following info
  - The importance of TB
  - The risk of TB
  - What to do if a TB suspect is not contacted
- Providing the correct info
  - Referring TB patients for X-ray
  - Managing contacts records

**RED FLAG LIST**

CLINIC NAME \_\_\_\_\_

DRUG STOCK OUTS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
FF												
STC												
RE												
ANC												
OTI												
Others:												

REFRIGERATOR NOT FUNCTIONING

Technical	Jan	
Fluency		
Cost		

STAFF ABSENT

Professional	Jan	
Non-Professional		

ESSENTIAL EQUIPMENT

Doughnut mixer	Jan	
Sm -		

RED FLAG ACTIONS

January	
April	
July	
October	

C. M. M.

For supervisor and clinic manager

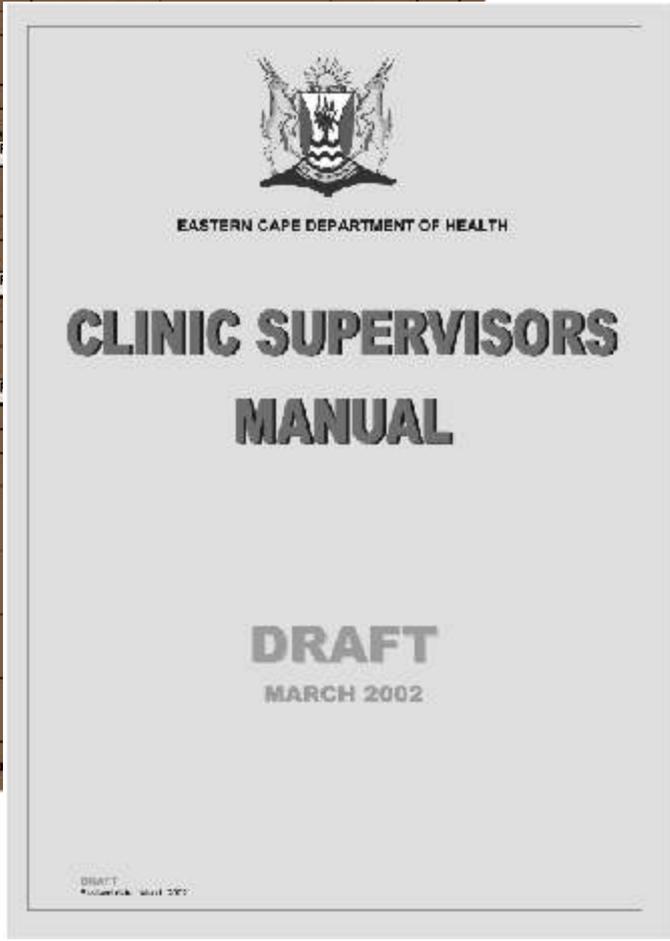


Figure 45: Clinic Supervisors Manual

with your clinic committee. They can take action to help achieve higher coverage or motivate TB cases to continue treatment or help malnutrition cases to obtain food.

Community concerns may not be the same as those of the health workers and every effort should be made to adapt feedback to the needs of the community. Their particular interest will often be on convenience, coverage and quality of care. As many of the determinants of health are rooted in behaviour and the conditions of life, most health problems can only be addressed in the community and household. Fertility, diet, and exercise habits, as well as use of services all determine health and the success of the health system. Most actions of health workers can only ameliorate problems which arise outside the health system. The current HIV epidemic is the best example. Proper sharing of clear unambiguous facts and health promoting information is essential to inciting effective household and community action. There is **no** other way forward!

## Feedback to other health-related sectors

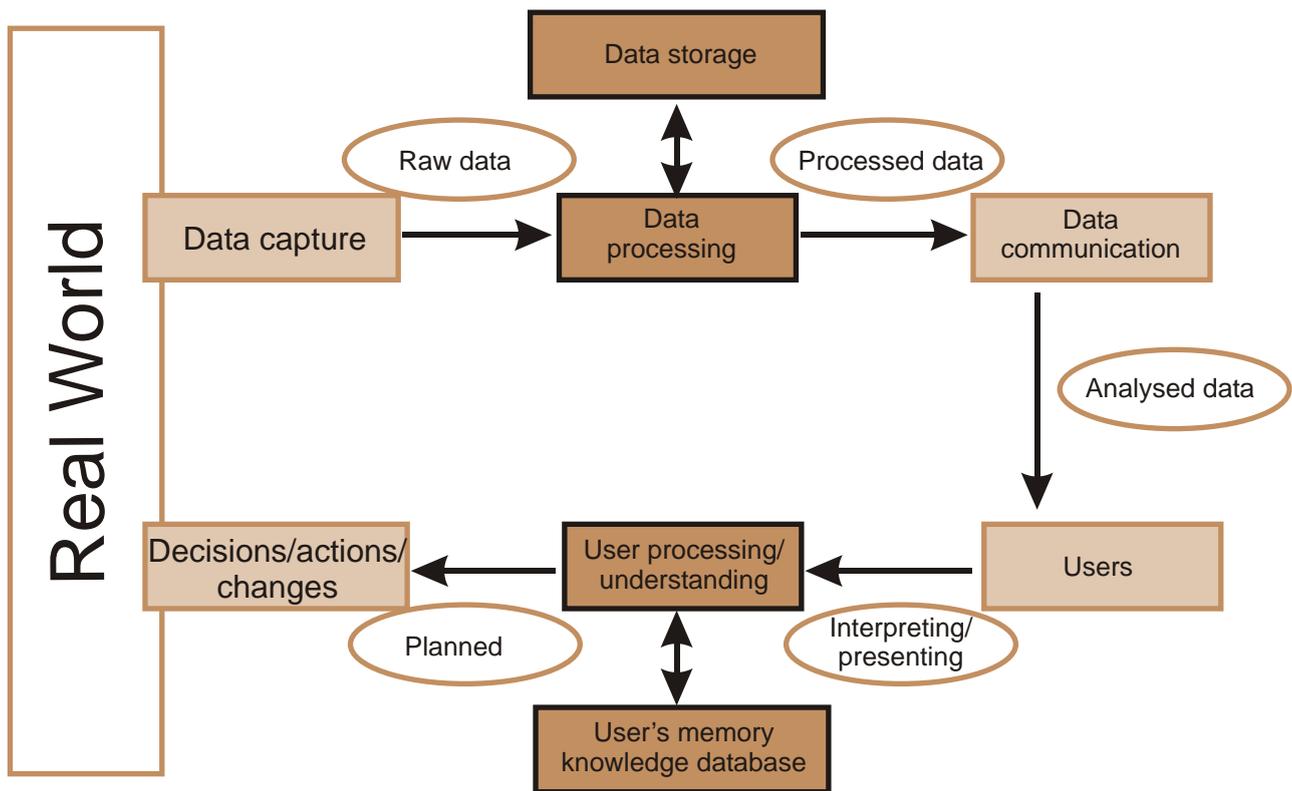
PHC is a team effort that involves workers from other health-related ministries. Health workers must ensure that other sectors are informed about health activities so that they are sympathetic to your situation. Examples may include:

- **Teachers** need information about cases of STIs, ARI, scabies, or a diarrhoea outbreak at school. They need to teach about FP and condom use.
- **Agriculture** extension workers can be told about rising malnutrition cases in a certain village. They can help needy families plant a garden at home or raise chickens, for example.
- Inform **police** of trends in assault cases, rapes, or car accidents and get their commitment to preventive activities.
- **Environmental health officers** or forestry and water officials need to know about diarrhoea outbreaks or typhoid cases.
- **Public works, Telkom, and Eskom** officials can be motivated with data showing numbers of emergency cases or maternity cases needing transport to hospital, or the need for lights at night, for example.

## MANAGEMENT INFORMATION CYCLE

The **management information cycle** shown on the next page places the information cycle in the context of the real world, from which data is captured (collected), processed, communicated and understood (analysed) by the users, added to the user's memory or knowledge database (interpreted) and then used in the real world again, to inform decision-making actions and changes.

The significance of this process for a facility is that information must be used in the environment in which it is captured, that is, in the individual programs where the service is provided. Unless a data item can influence decisions, support change, or promote action in the place where it is captured, it should not be collected!



The entire information cycle is designed to identify and promote actions at local level to improve health of a population. Appendix A describes many commonly used indicators and suggests local actions to consider in response to variations in these measures. Ultimately, it is these actions and the resulting improvements in the indicator values that justifies the efforts involved in the information cycle.

# Chapter 8

## Managing the Information System

The health information system needs to be managed just like any other program at the facility. To make it effective and worthwhile there needs to be a plan, resources need to be allocated, and time spent to make it effective and worthwhile.

### SIX STEPS TO A FACILITY INFORMATION SYSTEM

What follows is a general process for facility information system development that needs to be adapted to local circumstances, particularly at small facilities. It is important to state that these steps are guidelines and are not meant to be prescriptive. Although referred to as steps, they are not necessarily sequential, they are cyclical and may happen in parallel.

#### Step 1 - Form information teams

Teamwork is the essential key to interpreting information. No one person has all the skills to interpret all the complexities of information at a facility, and no one person has the right to “own” the results of the interpretation. The purpose of information is to inform on the functioning of a facility and its management. Everyone needs to benefit from it.

The first step is to set up an information team at the facility. The people making up the team need not be the most senior people and should include everyone managing data collection at facility level. It is important to have senior people who are interested and enthusiastic about the process to drive it.

A **facility information coordinator** should be nominated to manage the facility information. A clear job description should be developed and should include co-ordination of all information handling, maintenance of the facility information files, as well as the reporting, feedback and posting of information. This responsibility can be done on a rotational basis, if a number of people are interested.

The job of the facility information coordinator is:

- To ensure that all staff are aware of the importance of information and are collecting it accurately;
- To collect data from all staff and collate it into a monthly report for the facility;
- Where possible, to enter the data into the computer and make a print-out of the feedback report;
- To take the monthly feedback report back to the facility and discuss with other staff members;
- To ensure that graphs are drawn and displayed for all to see.

The facility information coordinator should be an active member of the district information team.

## Program teams

Each special program at a facility has a number of people working in it - some staff doing immunisation, some doing mobile work, others doing curative care. It is important to involve the support staff such as drivers, nurse aides and general hands in the interpretation process. If they understand, they are more likely to be involved and may be able to help actively in the information collection process. The collective local knowledge of the whole team is a crucial factor in interpreting the raw data and turning it into useful information.

Many people will be in multiple teams, particularly at smaller facilities. However small the team, it should meet on a monthly basis after the data has been processed, to ensure quality, convert it into relevant indicators, plot it on a graph and do some basic self-assessment of targets met. Are we doing as well or better than last month?

## Facility team

A similar process should happen at facility level (particularly at big facilities) where the heads of all the programs get together at the monthly staff meeting and formally present their indicators for the month, interpret the results for the other staff members who may not be familiar with the subject material, and get a discussion going on how to improve performance.

## Area teams

Supervisors have a key role to play in sharing information between facilities, encouraging analysis, presentation, and interpretation of locally gathered information and stimulating improved performance through friendly and controlled competition. Regular meetings of the heads of facilities in a particular area (rotating between different facilities if possible) are one of the best ways for facility managers to compare themselves to other similar facilities, and for everyone to improve quality of care for the community.

Information will not be the only topic at these meetings, but should be the central focus around which all other subjects revolve. These are PHC program meetings, **not** information meetings, but (like the planning cycle) the information provides the central core around which these meetings rotate.

## District information team

The district information team, consisting of representatives from each facility and the DHMT, should meet monthly to ensure that the information system is functioning in its entirety.

## Step 2 - Conduct an information audit

The first thing for the information team to conduct is an information audit to find out exactly what data is being collected and for what purpose. This process gets all staff thinking about:

- **WHO** collects data and for whom is it collected?
- **WHAT** data do they collect? On what forms? Is it useful locally?
- **WHEN** is data collected? How often it is reported on and acted upon?
- **WHERE** does data come from? Is it easy to collect?

- **WHERE** is data sent? Is it collated at a central point and analysed by the district before going to higher authorities?
- **WHY** is data collected? Is it for the collector or for the bosses in high places?
- **HOW** is data collected, and collated, then transformed into useful information for local action?

Gather all the forms, registers, cards, records, and reports in use at the facility and apply these questions to them. Try to reduce the data collected, assure standards definitions, and most important of all, determine its usefulness. Data not used by those collecting it should **not** be collected!

## Step 3 - Set objectives, indicators and targets to define a facility dataset

Each facility program must be encouraged to define exactly what it is trying to achieve and develop local “planning tools” (goals, indicators and targets). These tools enable progress to be measured and form the basis for a facility essential dataset. The DHIS is capable of adding data elements and indicators derived for each facility as required. However, common definitions as given in the national data dictionary **must** be used by everyone to ensure uniformity. If the dictionary does **not** contain a definition to suit your needs, the DIO can arrange to have it added. For every data item added, there **must** be one or more indicators defined and entered as well, and a good management reason for using the indicator **must** be recorded.

All local role-players need to be involved in the target-setting process and play a role in the plan to achieve these targets. Concrete targets based on defined indicators need to be chosen, achieved, evaluated and modified in a cyclic process. Once the simple indicators already in the system are being effectively used, you may choose to add more to increase your understanding of the local situation.

## Step 4 - Strengthen local information systems and structures

Routines and structures for collecting, analysing, reporting and using information should be modified to become facility oriented. Programs should report a minimum amount of data to the district information coordinator who will aggregate the data and produce a monthly report for the district. This process of routine reporting of aggregated data to the district information centre, including feedback of analysis and district summaries, is a valuable tool in developing a unified district.

## Ten Requirements for a Quality Information System

1. A dataset that is small, focused and relevant.
2. Definitions of all data items agreed by all stakeholders.
3. Simple tools, minimum overlap, useful, relevant, clearly laid out and effective.
4. Indicators relevant, agreed, valid, easy, sensitive and specific.
5. Analysis done locally by data gatherers themselves.
6. Presentation as graphs at meetings, in-service training and workshops.
7. Feedback is regular, focused and relevant.
8. Supervision is information-focused and supportive.
9. Teamwork is encouraged at all levels.
10. Training in information use is ongoing and part of an overall “learning culture”.

Figure 46: Requirements for a quality information system

## Step 5 - Develop staff skills and understanding

Staff capacity and awareness needs to be developed :

### In-service training

- Regular in-service training is an essential way of improving quality of health care at facilities. In-service training of staff in the day-to-day handling of information needs to be institutionalised at every opportunity. Once data starts to be converted to locally useful information, staff will rapidly become interested and will want to know how to use information themselves.
- Formal in-service training should occur at least once a month. The training does not need to be sophisticated - the best information training is hands-on, person-to-person training during routine support, using data that has been collected locally and that will be used locally.
- During in-service training, you should ask your facilitator about any problems you have had with the information system over the preceding month and share the feedback you have received, clarifying any issues you do not understand and asking advice on what activities you can undertake to improve service delivery.
- In-depth training may be carried out for the facility information coordinator and people involved in the “information team”, preferably at the district level.

### Meetings

- Meetings at all levels should have information quality, analysis and interpretation as a central focus and information use for improved quality of care as an essential output.
- Sensitisation workshops, held by supervisors or the DIO for all facility staff, will increase general awareness of information management in a general way.

## **Step 6 - Create a district information culture**

Once the facility has started to convert data into information, this information needs to be used on a regular basis at meetings, displayed on walls for staff and the public, as well as disseminated to the community, politicians and managers in health-related sectors. By being used, the information system is gradually improved through a cyclic process of learning. By learning through hands-on experiences, problems are identified, new needs are defined, new features are added, which will be criticised and improved in the next cycle. An information culture is achieved when everyone asks for hard data and clear indicators to plan, take action, or propose new activities, and when data speaks loudest for all decisions.

# Acronyms

<b>AFP</b>	Acute Flaccid Paralysis
<b>ANC</b>	antenatal care
<b>BAS</b>	Basic Accounting System
<b>CBO</b>	community-based organisation
<b>CHW</b>	community health workers
<b>CYP</b>	couple year protection
<b>DMER</b>	District Health Expenditure Review
<b>DHIS</b>	District Health Information System
<b>DHMT</b>	District Health Management Team
<b>DHS</b>	District Health System
<b>DIO</b>	District Information Officer
<b>DOH</b>	Department of Health
<b>DOTS</b>	Directly Observed Treatment Shortcourse
<b>EA</b>	enumeration areas
<b>ECDOH</b>	Eastern Cape Department of Health
<b>EHO</b>	Environmental Health Officers
<b>EPI</b>	Expanded Program of Immunisation
<b>FMS</b>	financial management system
<b>FP</b>	family planning
<b>GIS</b>	Geographical Information System
<b>HBP</b>	high blood pressure
<b>HISP</b>	Health Information System Program
<b>HIV</b>	Human Immunodeficiency Virus
<b>LBW</b>	low birth weight
<b>HST</b>	Health Systems Trust
<b>IUD</b>	intra-uterine device
<b>MCH</b>	maternal and child health
<b>MEDSAS</b>	Medical Supplies Administration System
<b>MSH</b>	Management Sciences for Health
<b>MUD</b>	male urethral discharge
<b>NGO</b>	non-governmental organisation
<b>NHISA</b>	National Health Information System of South Africa
<b>ORS</b>	oral rehydration solution
<b>PEM</b>	protein-energy malnutrition
<b>PERSAL</b>	Personnel Salary System
<b>PHC</b>	Primary Health Care
<b>PIIP</b>	Perinatal Problem Identification Program
<b>PTB</b>	pulmonary tuberculosis
<b>ReHMIS</b>	Regional Health Management Information System
<b>SoPH</b>	School of Public Health
<b>STI</b>	sexually transmitted infections
<b>TB</b>	tuberculosis
<b>TBA</b>	traditional birth attendant
<b>USAID</b>	United States Agency for International Development
<b>UWC</b>	University of Western Cape
<b>WHO</b>	World Health Organization
<b>WR</b>	antenatal syphilis test (Wasserman)

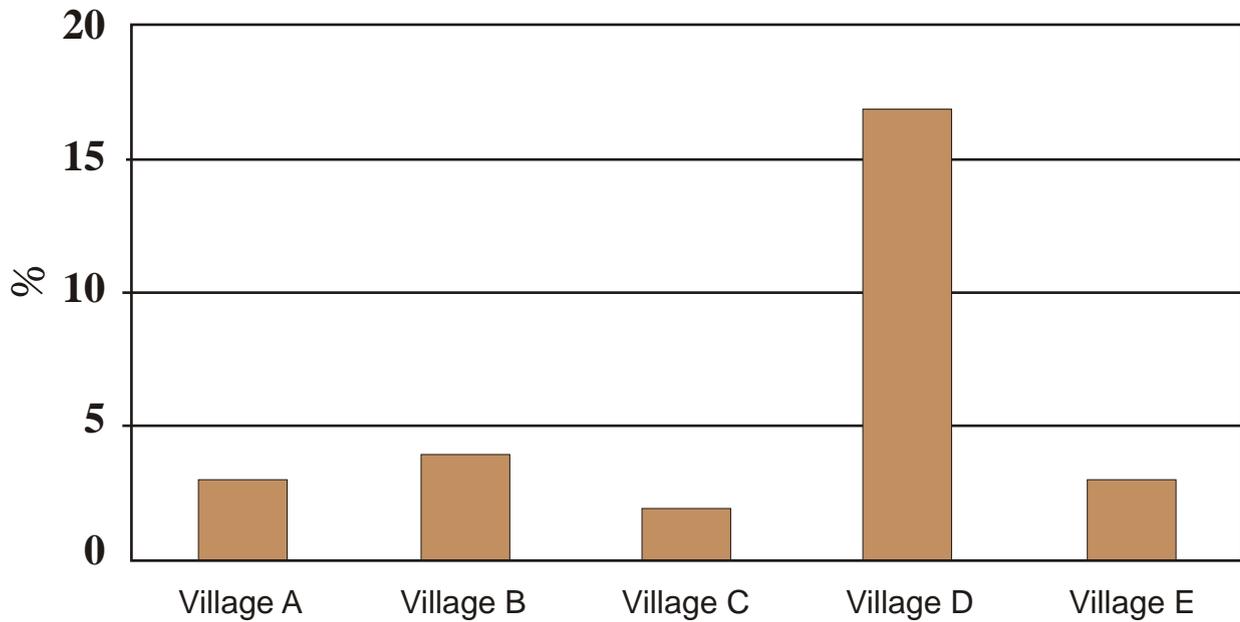
# Appendix A

## Some Indicators and Their Use

### Child Health Indicators

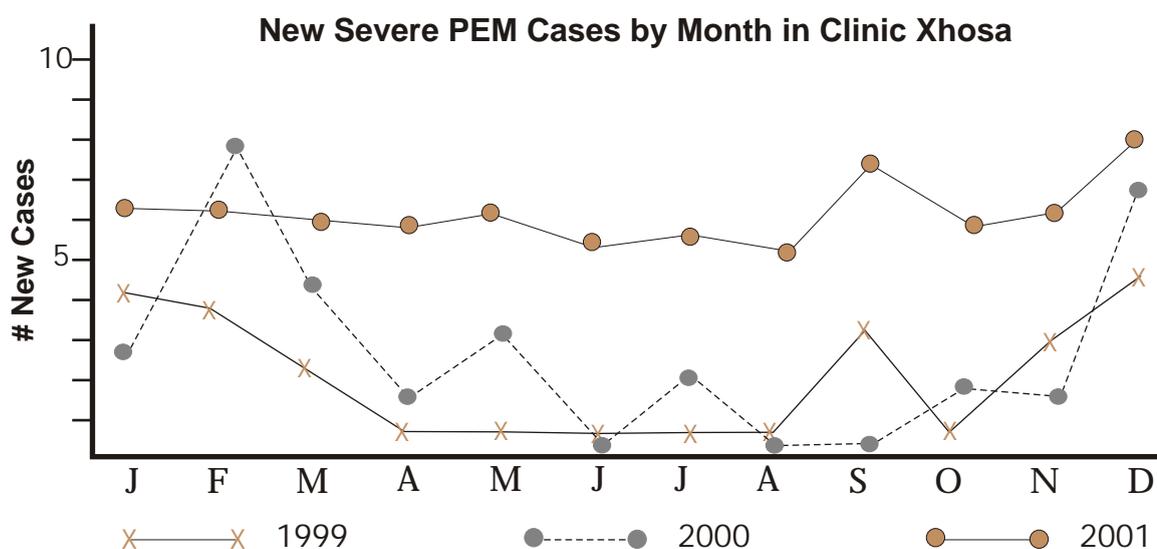
Name	Failure to gain weight rate
<b>Definition</b>	Percentage of children below the age of 5 years who had an episode of growth faltering/failure (failing to gain weight) during the month, or since the last visit if over one month. While each weight may be recorded on the Road to Health Card (RTH) a child should <b>not</b> be entered more than once in a month for either weighing or failure to gain weight, even if it is weight more often
<b>Calculation</b>	<b>Numerator:</b> Number of children <5 years failing to gain weight. <b>Denominator:</b> Number of children <5 years weighted.
<b>Rationale</b>	Failure to gain weight, even for one month, indicates early nutritional problem or an acute illness and is the most sensitive indicator of the nutritional well being of individual children or whole communities. This indicator encourages the use of the RTH card and raises awareness of the problem of malnutrition.
<b>Data Source</b>	Each weight is recorded on the RTH card, and the register if weight gain is absent. If there is no RTH card available, be very careful. The nutrition register, tick register, child health register are less reliable because of potential double counting.
<b>Normal Ranges</b>	No children should fail to gain weight, but the maximum acceptable is 3-5% Above that shows there is trouble.
<b>Common Mistakes</b>	Children coming back for rehabilitation are entered more than once in a month. Not all children coming are weighed - if only those who "look malnourished" are weighed, the results will be biased to severe malnutrition.
<b>Actions to Consider</b>	Any individual child not gaining weight needs to be put on an "at risk" register and followed closely, with support to the mother both at home and in the clinic. Communities with more than 5-7% of children not gaining weight need special nutrition remedial action and nutrition promoting activities.
<b>Graphs</b>	Simple line or bar graph of % children not gaining weight. The village location of those not gaining can be placed on a spot map - if clustered, do outreach to that village or community.
<b>Other Possible Indicators</b>	Nutrition is classically a field for sample surveys and sentinel site investigation, as routine growth monitoring is seldom accurately done. Yet, this is the most sensitive and accurate indicator of child health. <ul style="list-style-type: none"> <li>• <b>% children under the third centile</b> is a less sensitive indicator of current nutritional situation. this only picks up malnutrition once it is established. If all the weights of the children coming to the clinic are recorded on a large RTH card on the wall, one can easily see how many are malnourished - that is under the 60% line.</li> <li>• <b>Height for age</b> measures stunting (shortness) but this is not a measure of current nutrition - i.e. the child may have been sick long ago and not grown at that time- thus, this measure is used in survey/s to measure long term trends.</li> <li>• <b>Micronutrient deficiency</b> (Vit A, iodine, anaemia) requires special surveys to measure. However, mothers of children who are not gaining weight should be reminded to use iodised salt in the home, provide vegetables, eggs and meat to assure adequate micronutrients.</li> <li>• <b>Weighing coverage</b> (annualised) shows if you are looking at childhood growth - children should be weighed regularly - 24 times before their 5th birthday! This means monthly in the first year, quarterly in the next two years, and at least twice a year after that. Full performance would therefore be four weighings a year or 400%.</li> </ul>

**District Alpha: Child Health: Failure to Gain Weight Rate: May 1999**



Villages A, B, C and E have a low rate of children who are failing to gain weight as compared to Village D. Why is Village D's rate so high? Perhaps at present there is a severe food crisis in the area, or mothers need additional support in regards to understanding basic nutritional needs for a family and specifically children. Or perhaps the clinic provided the incorrect data to the district office. Or could Village D be right and all others are not measuring children adequately? This situation needs to be investigated using local knowledge.

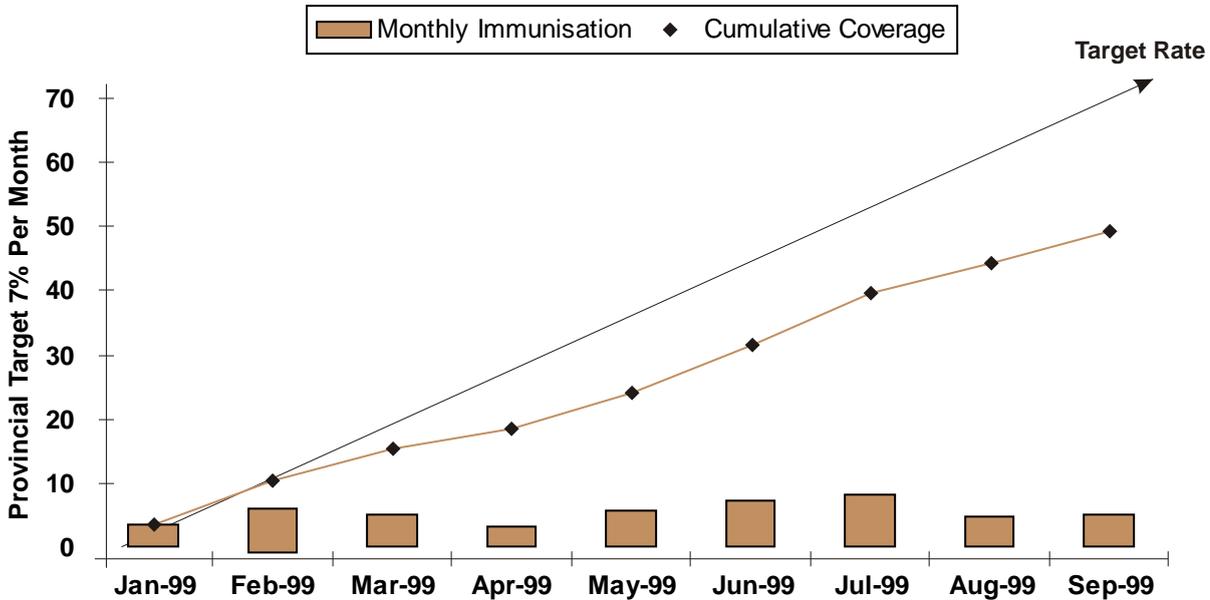
Name	Severe malnutrition rate (new cases)
<b>Definition</b>	The proportion of children who are weighed who are newly found to be suffering from kwashiorkor, marasmus or have weight under 60% of expected weight for age.
<b>Calculation</b>	<b>Numerator:</b> Number of children <5 years with new severe malnutrition. <b>Denominator:</b> Children <5 years weighed.
<b>Rationale</b>	Severe malnutrition is a failure of preventive services and is the tip of the iceberg representing the larger pool of malnutrition in the community. These children should have been found and nutrition intervention begun earlier.
<b>Data Source</b>	Clinic tick register - special register for protein-energy malnutrition (PEM) scheme
<b>Normal Ranges</b>	<b>No</b> children should be severely malnourished. Any severely malnourished child is a danger signal of a big problem.
<b>Common Problems</b>	Most children with severe malnutrition do not come to the health services and die at home. Not all children are weighed at clinics.
<b>Actions to Consider</b>	All children with severe malnutrition should be referred to a hospital. If you find children with severe malnutrition, you should consult community leaders and actively look for other cases in the community. Community-based feeding schemes and social welfare events need to be promoted in affected communities.
<b>Other Possible Indicators</b>	The <u>incidence</u> of severe malnutrition in the community is measured using the denominator of the total number of children under five, rather than only those weighed. Severe malnutrition can be measured <u>by age group</u> to ind out which age suffers most from this problem. <u>Treatment rate</u> of severe malnutrition is measured by comparing the numbers of children on the PEM scheme with the number of children in the community. The ratio of new severe malnutrition cases to the number of children on the <u>PEM scheme</u> shows whether the PEM is targeting the truly malnourished children. % children <u>successfully discharged from the PEM</u> scheme will show how effective the PEM scheme is.



What do you learn from this graph about season? What about the trend in PEM from year to year? Actions to take?

Name	Fully immunised coverage
<b>Definition</b>	<p>The percentage of all children in the target area under one year who have received the full series of primary immunisation prior to reaching age one year. This is usually about the same as measles coverage at 9-12 months.</p> <p>A full primary course of immunisation includes BCG, TOPV 1, @ &amp; 3, DPT/Hib 1,2 &amp; 3, HBV 1, 2 &amp; 3, and 9 month measles.</p>
<b>Calculation</b>	<p><b>Numerator:</b> Number of children &lt;1 year fully immunised - recorder only once for each child on the visit when they received their last immunisation shot (usually 1st measles) at the clinic on that day.</p> <p><b>Denominator:</b> Number of children reaching 1 year of age in the catchment area for the same period of recording as used in the numerator (month, quarter, year to date, calendar year). Use the same period of time for both numerator and denominator.</p>
<b>Rationale</b>	<p>Immunisation coverage compares the number of fully immunised children to the number of children under one year old. this indicator is a wide-ranging measure of nursing skills, clinic management skills, transport management, community participation, cold chain and effectiveness of health education.</p>
<b>Data Source</b>	<p>Register (tick or immunisation), or immunisation tally sheets. Population data children &lt; 1 year.</p>
<b>Normal Ranges</b>	<p>The National DOH has a target of 90% fully immunised children by 1 year of age; the provinces have each set their target and these need to be modified by the district, depending on past performance.</p>
<b>Common Problems</b>	<p>Never count a child twice - only record a child as fully immunised if you yourself have given the final dose on the same day!</p> <p>Counting of children who come back to the clinic after they have previously been fully immunised at your clinic or elsewhere causes incorrect coverage rates.</p> <p>The denominator data may be wrong - be sure you use the denominator period the same as the numerator - also the catchment area of the clinic may not reflect outsiders into the catchment area who use the clinic - check with your supervisor.</p>
<b>Graphs</b>	<p>A cumulative immunisation coverage graph shows the numbers fully immunised to date this year, by adding the current month's data to the previous months to show the total for the year. Measles and BCG may be graphed on the same graph - this will show achievement of target and dropout rate since BCG starts the series and measles ends it.</p>
<b>Actions to Consider</b>	<p>Low immunisation coverage needs a review of your immunisation strategy. Communities with low coverage need to be identified and special efforts made to immunise them.</p> <p>Coverage should never be over 100% annually. If your coverage is &gt;100%, check population figures, make sure children are not being counted twice and investigate outsiders coming into your area.</p>
<b>Other Possible Indicators</b>	<p>Monthly immunisation rate is often multiplied by 12 so that the projected picture for the whole year can be estimated. This is the <b>annualised immunisation</b> rate.</p> <p><b>Measles coverage</b> is a good proxy indicator to compare to fully immunised - normally they are very similar. If they are different, we need to look at fully immunised data for accuracy.</p> <p><b>Cold chain</b> performance can be measured by plotting % days the refrigerator is outside the normal range.</p> <p><b>Availability</b> of vaccines is measured using measles stock-outs in the drug list</p> <p><b>Drop out rate</b> from e.g. BCG to measles (0-9 months), DPT1 to DPT3 (6 weeks - 14 weeks) and DPT1 - Measles) are useful indicators to assess quality of immunisation. If BCG coverage is much lower than DPT1, the hospitals are probably <b>not</b> reporting into the DHIS!</p> <p>Measles case incidence is a measure of the <b>impact</b> of your immunisation program.</p>

**Health District : Child Health: Children Fully Immunised  
Jan-Sept 1999**



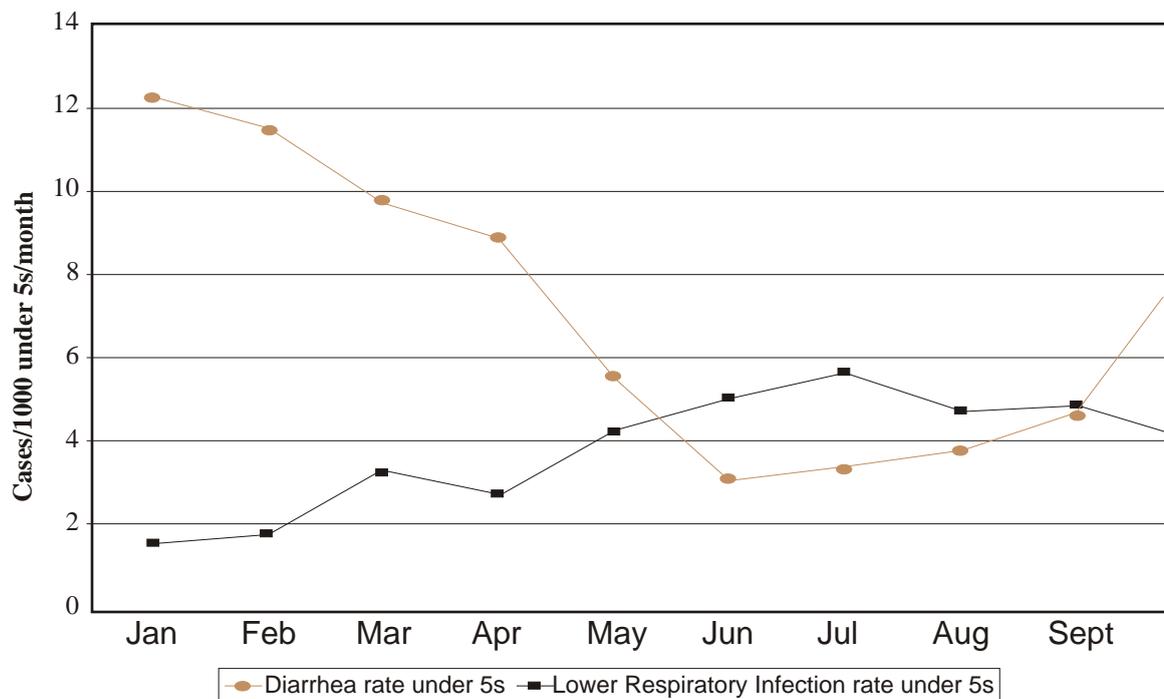
	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Jul-99	Aug-99	Sep-99
Monthly Immunisation	3.5	6.8	4.9	3.1	5.7	7.3	8.2	4.7	4.9
Cumulative Coverage	3.5	10.3	15.2	18.3	24.0	31.3	39.5	44.2	49.1
Target Coverage	7	14	21	28	35	42	49	56	63

This is an example of a cumulative coverage graph which demonstrates the percent of children immunised every month and then adds up the months to show what percentage of children have been immunised after a certain number of months. In order to fully immunised at least 80% of children before they turn one year old, on average some 7% of the children need to be immunised every month. Reasons for poor immunisation levels may include no measles or other vaccine in stock and fridge out of order as examples. Immunisation levels at present in the Eastern Cape Province are just over 60%.

Name	Incidence of diarrhoea in children
<b>Definition</b>	<p>The number of children with new episodes of diarrhoea per 1,000 children under five years in the catchment population.</p> <p>Diarrhoea is formally defined as three or more watery stools in 24 hours, but in practice any complaint by the mother that the child is suffering from diarrhoea should be counted</p>
<b>Calculation</b>	<p><b>Numerator:</b> Number of children &lt;5 years with diarrhoea.</p> <p><b>Denominator:</b> Number of children &lt;5 years of age.</p>
<b>Rationale</b>	<p>Diarrhoea incidence in children is a sensitive indicator of environmental health and socio-economic conditions. However, many cases do not come to the clinic and one has to beware of the "hippopotamus effect" where one sees only the nose of the hippo above water and misses the big animal under water. These children usually need a special survey to detect them.</p>
<b>Data Source</b>	<p>Tick register, facility register, OPD register</p> <p>Population data - &lt;5 - normally 15 -17% of the total population.</p>
<b>Normal Ranges</b>	<p>There are no fixed targets. However, surveys show that you can expect about three episodes for each child per year - far fewer come to the facility for treatment. Seasonal variation and inter-village differences are signs of a problem that needs investigation.</p>
<b>Graphs</b>	<p>Simple bar graph of diarrhoea incidence by month, especially comparing different areas.</p> <p>A line graph of <u>number</u> of cases of diarrhoea, along with other childhood diseases such as Lower Respiratory Tract Infection (LRTI) is useful to show trends over time.</p> <p>A spot map is useful to identify outbreaks.</p>
<b>Actions to Consider</b>	<p>Treatment with salt and sugar solution in the home will prevent dehydration and death - make sure mothers know this.</p> <p>Diarrhoea needs an intersectoral action involving environmental health officers, water affairs and housing ministries, as well as fundamental health promotion measures.</p> <p>Diarrhoea incidence usually increases in warm months. A rapid increase could indicate an outbreak of dangerous infection such as typhoid, cholera or dysentery.</p> <p>Identify communities with high incidence and investigate the causes with some action research through a community survey - poor water supply, poor personal hygiene, or lack of toilets all need health promotion interventions.</p> <p>Environmental health officers can be called on to do stool samples to identify causative agents if indicated in a severe outbreak.</p>
<b>Other Possible Indicators</b>	<p>Bloody diarrhoea (dysentery) is a notifiable disease and should be monitored in all age groups.</p> <p>Cholera often starts in children with vomiting - later watery diarrhoea is profuse. Summer is a more common time for cholera.</p> <p>Percentage households with access to portable water of toilets will give a long-term indicator and should be part of environmental health indicators</p> <p>Community surveys will identify the children with diarrhoea, and the possible causes.</p>

Name	Lower respiratory tract infection (LRTI) rate (<5 years)
Definition	The proportion of children presenting who have a respiratory rate of over 50 per minute.
Calculation	<b>Numerator:</b> Children presenting with respiratory rate > 50 breaths per minute. <b>Denominator:</b> Headcount <5 years..
Rationale	Lower respiratory tract infection is a common killer of children and these deaths can be prevented if the child is given early and appropriate antibiotics.
Common Problems	Every child with cough should have her respiratory rate measured to check for rapid respiration. This is the only reliable measure of lower respiratory infection.
Data Source	Clinic register
Normal Ranges	LRTI s very seasonal, with more cases in winter than in summer. The summer peak should be less than 20 children per 1000.
Graph	Line graph (with other childhood diseases such as diarrhoea, measles etc).
Actions to Consider	High or rising rates of lower respiratory infection mean that there may be some environmental problem affecting the children in their homes. This may be smoke from fires, poor ventilation, rising damp from poor housing or just long, hard and wet winters. Check use of drugs - only LRTI cases should be receiving antibiotics for respiratory symptoms cough and cold should not - follow standards treatment guide.
Other Possible Indicators	The incidence of LRTI in the population is obtained if the total population <5 years is used as a denominator. In urban areas, the air pollution index may be linked to increased respiratory infection and GIS can be used to detect polluted clusters. Make a ratio of number of paediatric cases given antibiotics divided by LRTI. This ratio should not be much over 1.0

Seasonality of Diarrhoea and Lower Respiratory Infection in under 5s

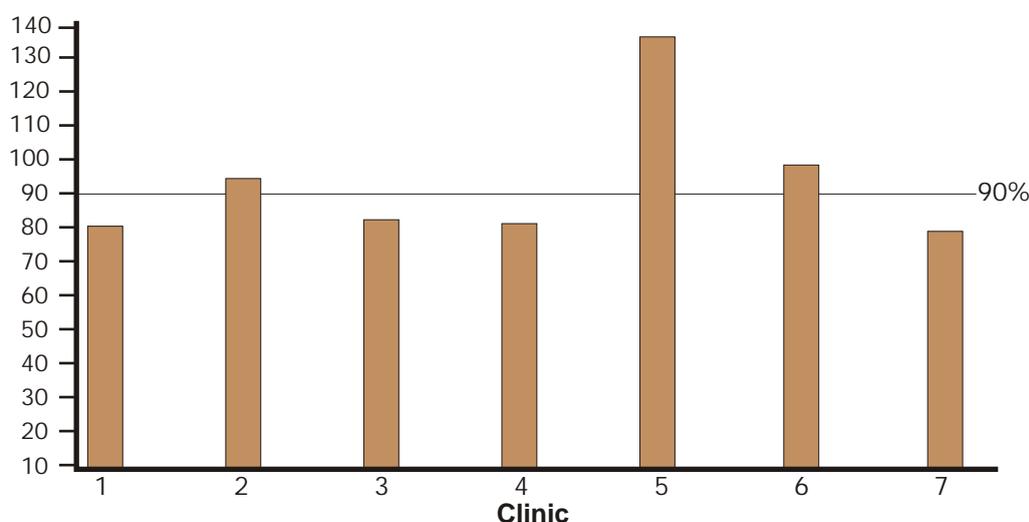


Diarrhoea tends to be seasonal with a peak in the summer months with a reduction in winter. Lower respiratory tract infection tends to be seasonal with peaks in winter.

## Maternal Health Indicators

Name	Antenatal care coverage
<b>Definition</b>	Percentage of pregnant women attending ANC at least once. This visit should be a "booking" visits where all initial procedures relating to assessing/preparing a woman for pregnancy and delivery occur.
<b>Calculation</b>	<b>Numerator:</b> All first ANC (initial) visits
	<b>Denominator:</b> Total expected deliveries (2.2-3.2% of population). Discuss with supervisor - obtain estimate from DHIS.
<b>Rationale</b>	All women should have at least three antenatal visits during a pregnancy. These should start as early in pregnancy as possible.
<b>Data Source</b>	Tally sheets, registers - either tick register or maternal health registers. Population data - an estimate of the number of pregnant women is close to the number of children born.
<b>Normal Ranges</b>	The national target is 90%; the provincial target is 90%.
<b>Common Problems</b>	Women who have started ANC elsewhere, but who come to your facility for follow up should be counted as subsequent ANC and <b>not</b> first ANC.
<b>Actions to Consider</b>	Low coverage means either the strategy for providing ANC needs to be reviewed to increase access, or the community should be approached to increase awareness. High coverage may mean problems with your choice of denominator, or double counting.
<b>Other Possible Indicators</b>	risk and continuity indicators are important in ANC. % women getting third ANC shows continuity of care, which is often related to perceived quality. WR coverage shows quality of care - this should be taken at first ANC visit. ANC referrals shows risk detection (and transport availability). % ANC booking ,20 weeks shows early care and level of awareness. Unbooked deliveries at facilities is an accurate indicator of failure of ANC services.

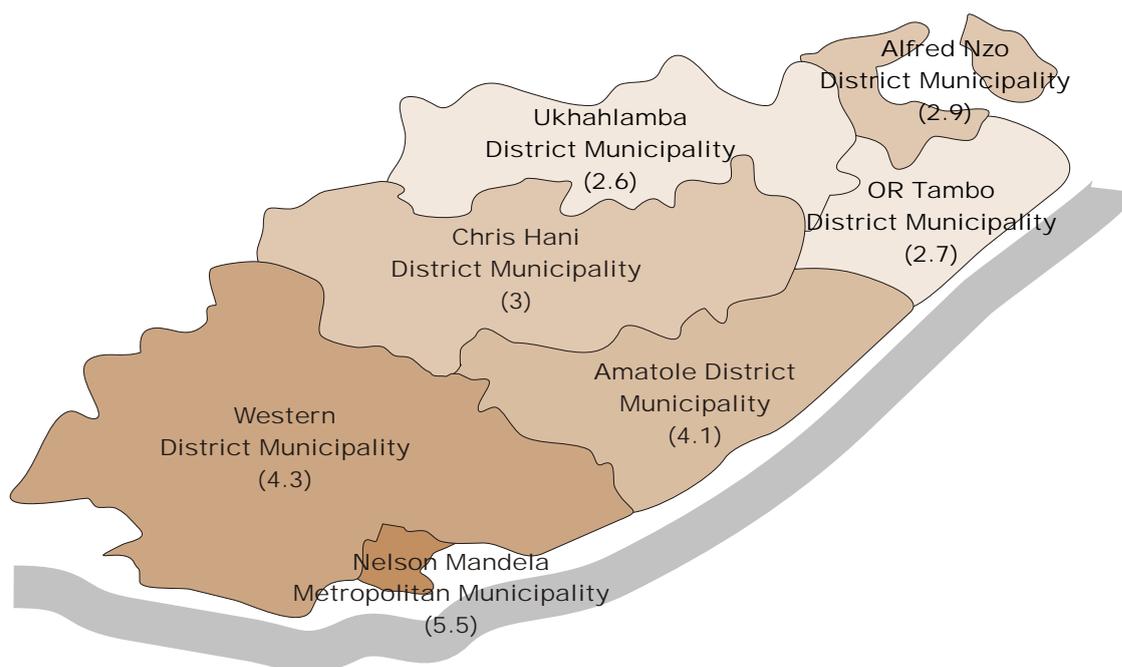
**ANC Coverage % of Estimated Pregnant Women**



These facilities are all providing good ANC coverage, as all are close to, or above the target line. Clinic 5 is reporting many more than expected. Either the population estimate is too small or perhaps they are reporting return ANC visits as a first ANC visit.

Name	ANC visits per client
<b>Definition</b>	Average number of antenatal visits by women coming to antenatal care.
<b>Calculation</b>	<b>Numerator:</b> All ANC visits (first and repeat visits all included).
	<b>Denominator:</b> First ANC visits.
<b>Rationale</b>	All pregnant women should have at least three visits in each pregnancy. This indicator does <b>not</b> measure individual visits by each woman, but measures the average number of visits.
<b>Data Source</b>	Tally sheets, register - either tick register or maternal health registers.
<b>Normal Ranges</b>	The national target is that 90% of women should have at least three ANC visits.
<b>Common Problems</b>	Women who have started ANC elsewhere, but who come to your facility for follow up should be counted as subsequent and <b>not</b> first ANC.
<b>Actions to Consider</b>	Low repeat visits means that there may be problems with the acceptability of the services provided and the attitude of staff needs to be investigated
<b>Other Possible Indicators</b>	% ANC clients having three visits (if data is available). This can be done with a tally sheet if needed. %ANC clients referred to hospital. Tetanus toxoid coverage is another important ANC quality indicator - what proportion of pregnant women are protected against tetanus? % WR positive who are treated (important quality measure - should be 100%).

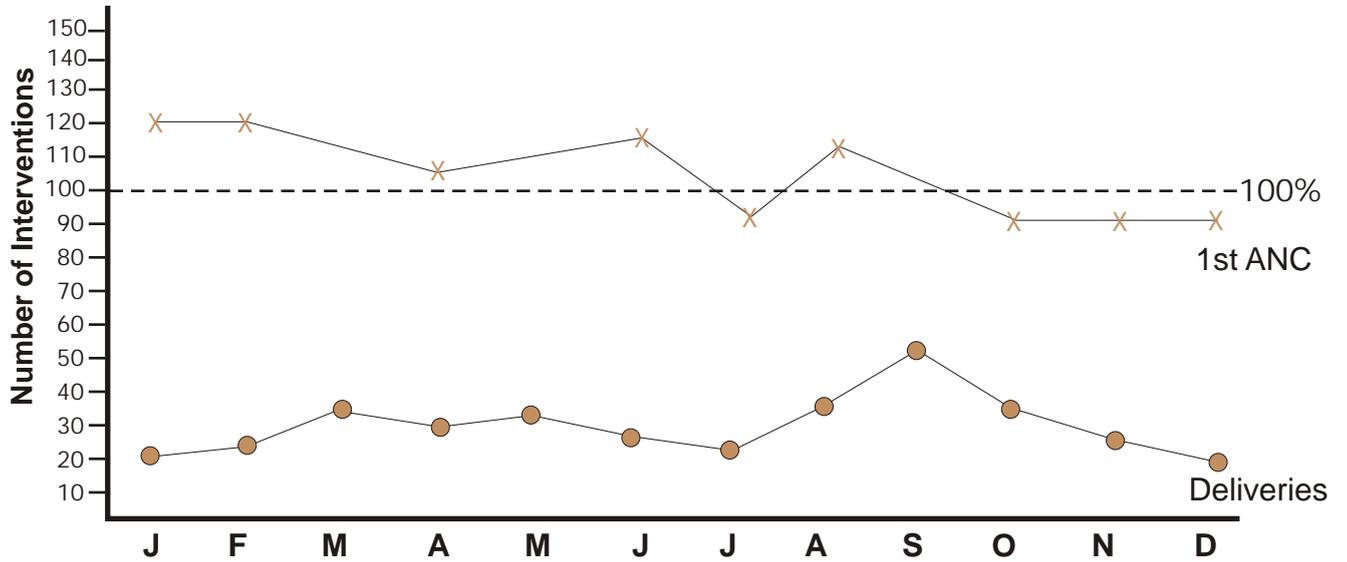
**Map of the Eastern Cape Showing Average ANC Visits per ANC Client for Each of the Seven District Municipalities**



Often small differences in numbers appear more dramatic when portrayed in a map.

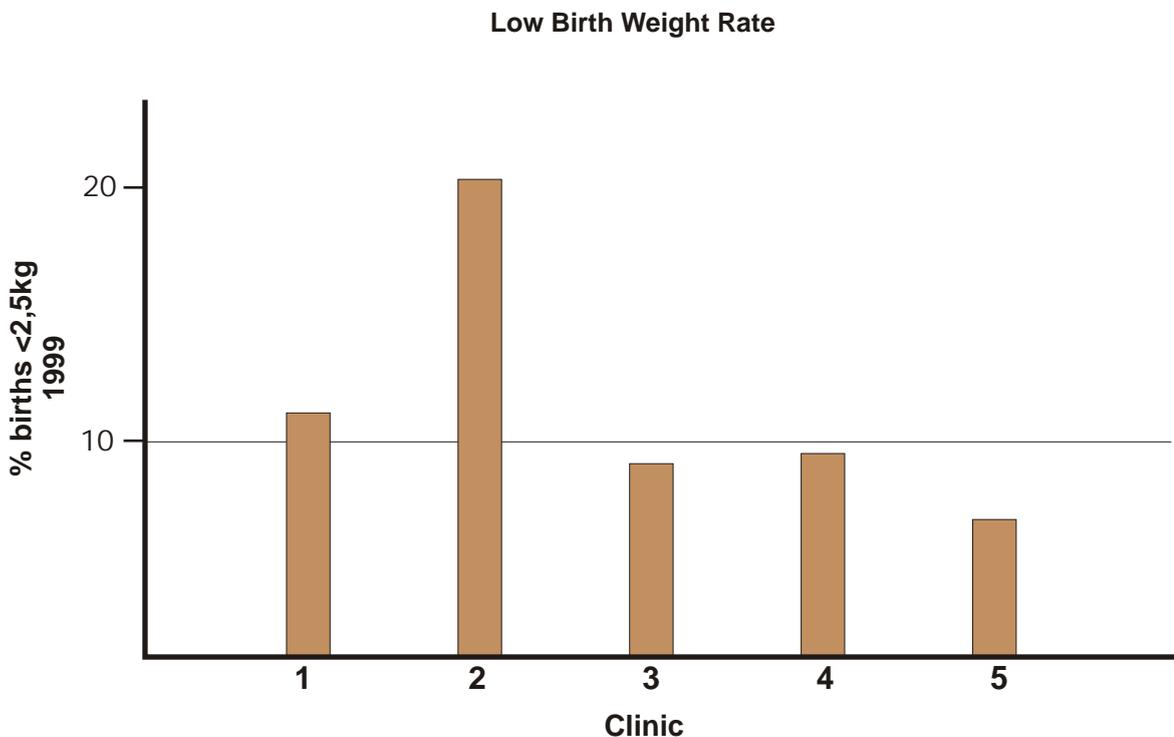
Name	Institutional delivery coverage
<b>Definition</b>	The percentage of deliveries from the catchment population taking place in this reporting health facility under supervision of trained personnel.
<b>Calculation</b>	<b>Numerator:</b> Number of deliveries conducted in this institution in the reporting period
	<b>Denominator:</b> Total expected deliveries in this population for the same time period. The number of children under one year is used as a proxy denominator for expected deliveries per year - divide by 12 for monthly estimate.
<b>Rationale</b>	The proportion of deliveries done by the institution is an indicator of accessibility and acceptability of the health services.
<b>Data Source</b>	Maternity (delivery) register. Expected deliveries is 2.2 - 3.4% of population (discuss with supervisor).
<b>Normal Ranges</b>	The national average is 80%. Some provincial averages are much lower but some achieve almost 100%. This depends largely on delivery infrastructure, access to transport and customs of the population.
<b>Common Problems</b>	Many clinics report deliveries of their clients that occurred in institutions elsewhere. This causes double reporting for they are reported from the place where they actually deliver as well. As most deliveries occur in hospital, this indicator is really only valid at the district level where all deliveries in all institutions are added together and compared to all expected deliveries in the district population.
<b>Actions to Consider</b>	If less than 80% (perhaps 60% in rural areas) of deliveries in the district occur at health facilities, (or with trained TBA assistance), your maternal health services need to be re-examined. The facilities need to be assessed for capacity to provide emergency obstetric services. Adequate transport to hospital and even facilities for mother to live in when nearing term of delivery may be required.
<b>Other Possible Indicators</b>	Maternal mortality rate is a district-level indicator which assesses the quality of maternity services - there are so few maternal deaths that each should be thoroughly investigated. MMR in a district is usually meaningless due to tiny numbers. Ambulance turnaround time shows how long it takes for a facility to be served by ambulance services and can be monitored and improved. % essential delivery equipment shows how prepared facilities are for doing deliveries. Deliveries by trained midwives is a useful indicator where there is a TBA program. High risk deliveries to girls under 18, primiparous women over 35, high parity or previous Caesars etc. shows the degree to which risk factors are monitored.

First ANC vs Deliveries



There is a huge gap between ANC visits and institutional deliveries. What can you do to convince mothers to deliver in an institution?

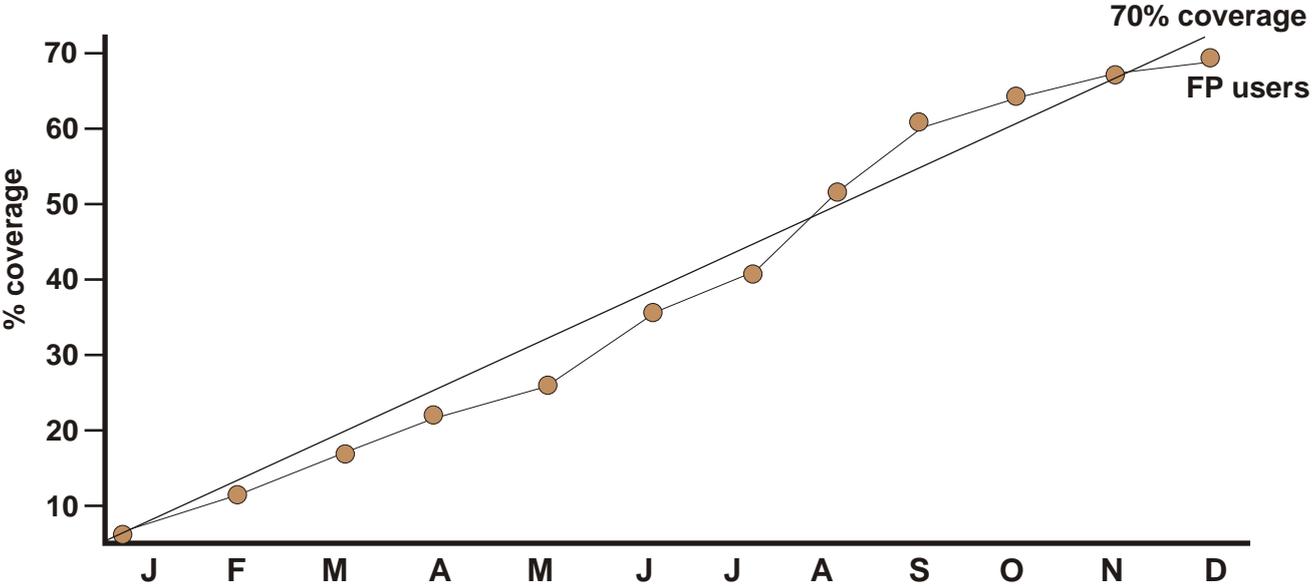
Name	Low birth weight rate
Definition	Percentage of live born babies children with a birth weight under 2,500 grams
Calculation	<b>Numerator:</b> Number of live babies delivered with a birth weight < 2500g. <b>Denominator:</b> Total number of live births during the period.
Rationale	Live babies with weight of <2,500 grams may indicate poor nutritional status of mothers, but may be influenced by other factors such as smoking, alcohol abuse, other illness such as TB, HIV or chronic lung or heart disease.
Data Source	Maternity or delivery register.
Normal Ranges	Less than 10% of all births should be under 2,500 grams.
Graphs	Simple line graph of % children with low birth weight. This could be combined with other nutrition indicators e.g. % children ,3rd centile, children not gaining weight
Actions to Consider	High levels of low birth weight (LBW) mean poor nutritional status of mothers, which needs comprehensive and integrated nutrition programs and intensive education. Each LBW baby needs close follow-up at home and weekly weighing till she reaches 5kg weight. Exclusive breastfeeding is the best diet for LBW babies - help the mother breast feed.
Other Possible Indicators	Failure to gain weight rate in <5 year olds. % children 1-5 years severely malnourished. HIV positive rate in ANC mothers. Babies exposed to maternal alcohol or smoking. Anemic rate in pregnant women.



The population served by Clinic #2 needs investigation and appropriate intervention to reduce this unacceptably high percentage of babies born with weight <2.5 kgm.

<b>Name</b>	<b>Couple (Women) year protection (CYP) rate</b>
<b>Definition</b>	Percentage of women in the community protected by "modern" family planning methods.
<b>Calculation</b>	<b>Numerator:</b> Number of women protected by each family planning method. <b>Denominator:</b> Number of fertile age women (15-45 years).
<b>Rationale</b>	Each family planning method is effective for different periods - this is a calculated indicator which measures the contribution of each method to protection of the female community.
<b>Data Source</b>	<p>The easiest way to calculate this is from the stock cards - note the total outgoing contraceptives for each type and divide by the appropriate factor:</p> <ul style="list-style-type: none"> <li>• Pills ÷ 13</li> <li>• Depo ÷ 4</li> <li>• Nuristate ÷ 6</li> <li>• IUD x 4</li> </ul> <p>It can also be calculated from the tick register, but this is more work. Fertile women are approximate 20% of total population.</p>
<b>Normal Ranges</b>	The national target is 65%, the SADHA showed 50%.
<b>Graphs</b>	Cumulative coverage graph of women years protected; pie of method mix.
<b>Actions to Consider</b>	<p>Low coverage means that unwanted pregnancies will occur. Increased CYP will occur mainly through health promotion and increases status of women, but will also be increased by:</p> <ul style="list-style-type: none"> <li>• increasing availability of contraceptives to teenagers, working women and other high risk groups;</li> <li>• improving the contraceptive mix to include more effective and long-term contraceptives such as injectables, IUDs and sterilisations.</li> </ul>
<b>Other Possible Indicators</b>	<p>This indicator is best annualised - i.e. the months value multiplied by 12 to get a picture of what would happen if this rate continued throughout the year.</p> <p>termination of pregnancy referral rate is an indicator of failed contraception leading to unwanted pregnancies.</p> <p>%CYP under 20 years indicates the effectiveness of our coverage of the high risk group of teenagers.</p> <p>Method mix is the relative proportion of total CYP provided by each method. It is best visualised as a pie diagram.</p> <p>Acceptor rate is a useless indicator which should not be used as it does not measure protection of women, but merely attendance.</p>

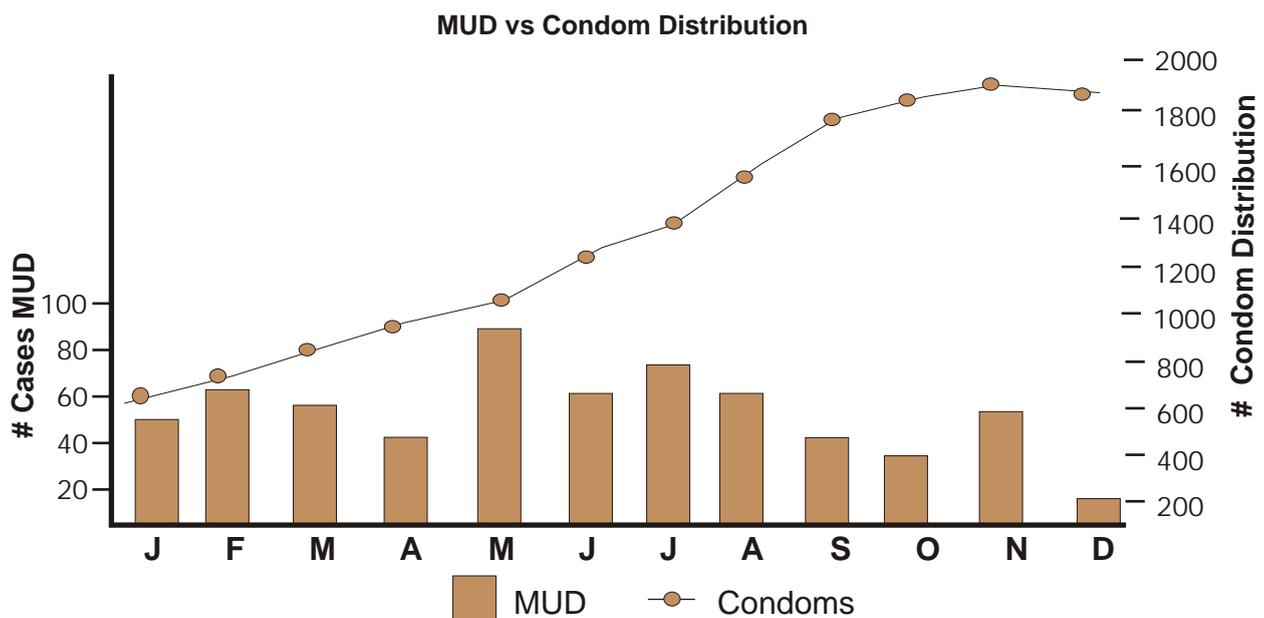
Family Planning  
Cumulative Couple Year Protection Rate



This clinic nearly achieved its own target of 70% couple year protection - a community “push” in July-August was not sustained late in the year.

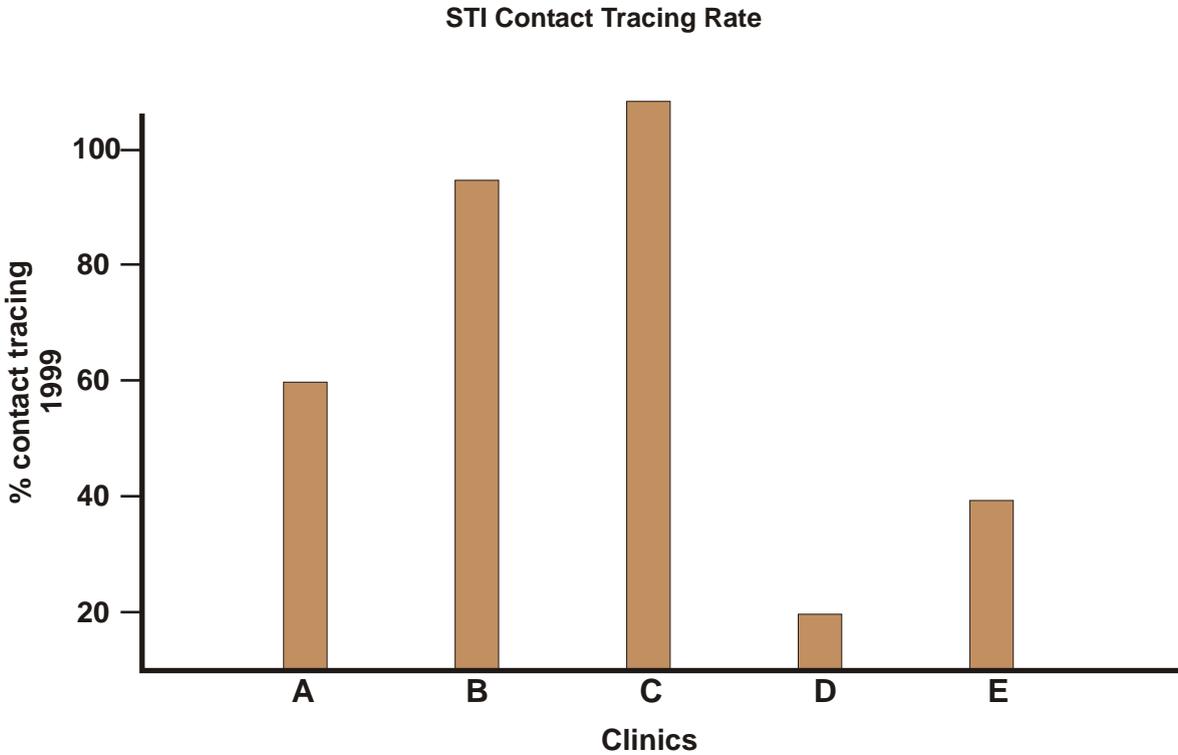
## Disease Indicators

Name	Incidence (new cases) of male urethral discharge (MUD)
<b>Definition</b>	The number of new cases of male urethral discharge coming for the first treatment of a fresh episode - per 1,000 males over 15 years in the target population. It is also called Penile Urethral Discharge.
<b>Calculation</b>	<b>Numerator:</b> Number of new male urethral discharge cases.
	<b>Denominator:</b> Male population over 15 years.
<b>Rationale</b>	MUD is used as a proxy to estimate all other STIs, as it is a true STI, easily diagnosed, usually has to come for treatment and responds well to syndromic treatment. Many of the other STI symptoms may actually not be STIs and to include them overestimates STIs. Changes in male urethral discharge are the best measure of changes in new cases of all STIs.
<b>Data Source</b>	Tick register and males (=/- 20%) in the total population.
<b>Actions to Consider</b>	High male urethral discharge rates are indicative of unprotected sex and will only be reduced if condom usage is improved and health promotion messages about safe sex are adhered to.
<b>Other Possible Indicators</b>	<p>Reproductive tract infection rate. The incidence of all new cases of STIs treated syndromically will give a less sensitive indicator of the true incidence of STIs in the community, as not all of these will be true STIs (e.g. vaginal discharge is most often not sexually transmitted).</p> <p>Condom utilisation rate will show how much sexual activity is protected using condoms.</p> <p>Ratio of male urethral discharge to all STIs will show the proportion of "all" STIs that are attributed to male urethral discharge.</p> <p>HIV rate is another indicator of STI, but surveys give only provincial prevalence, not for individual facilities.</p>



As condom distribution has increased, MUD has clearly declined: a probable, but not proven, causation.

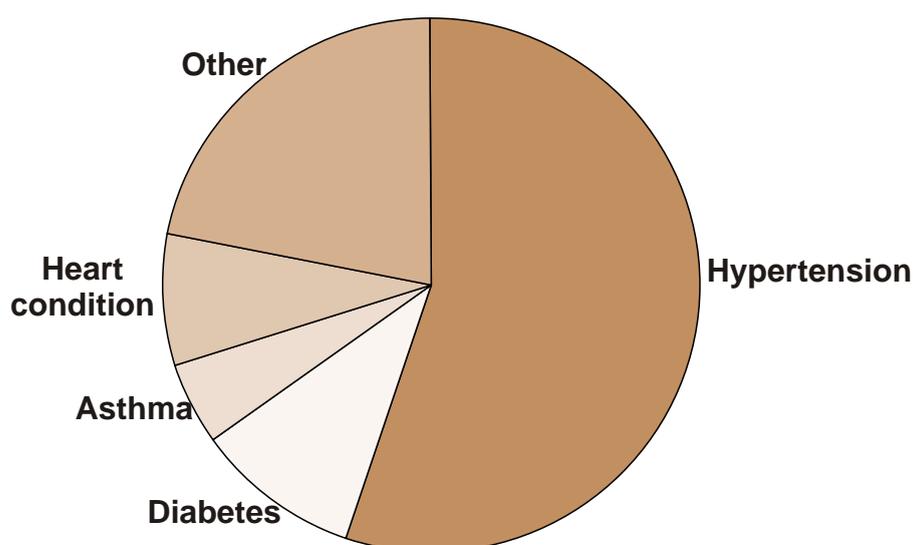
Name	STI contact tracing rate
Definition	The percentage of STI contacts who are treated at the facility, either coming with contact slips or saying that they were told to come by their partners
Calculation	<b>Numerator:</b> Number of contacts treated.
	<b>Denominator:</b> Number of contact slips issued.
Rationale	The percentage of STI contacts coming for treatment is a good indicator of the quality of the health promotion component of the STI program.
Data Source	The numerator will include the number of contact slips that are returned to a facility and the contacts who come saying they want to be treated.
Normal Range	This should be 100%
Problems	Some patients will have their cards issued at your clinic, and their partners will go elsewhere for treatment; and others issued by other clinics will come to you if you are good! this will, of course, even itself out in the longer run and in bigger units like districts.
Actions to Consider	A low rate (<80%) means that clients have been given bad service or no privacy, or have not had adequate health education about the need to get their partners treated. This needs clear messages to be taken into the community, particularly amongst the high risk groups.
Other Possible Indicators	Condom utilisation rate will show how much sexual activity is protected. Incidence of male urethral discharge - a dropping in male urethral discharge rate will show that the contact tracing is working effectively.



Clinics D and E need strong encouragement to improve community liaison and other means to reach and treat contacts for each case of STI seen.

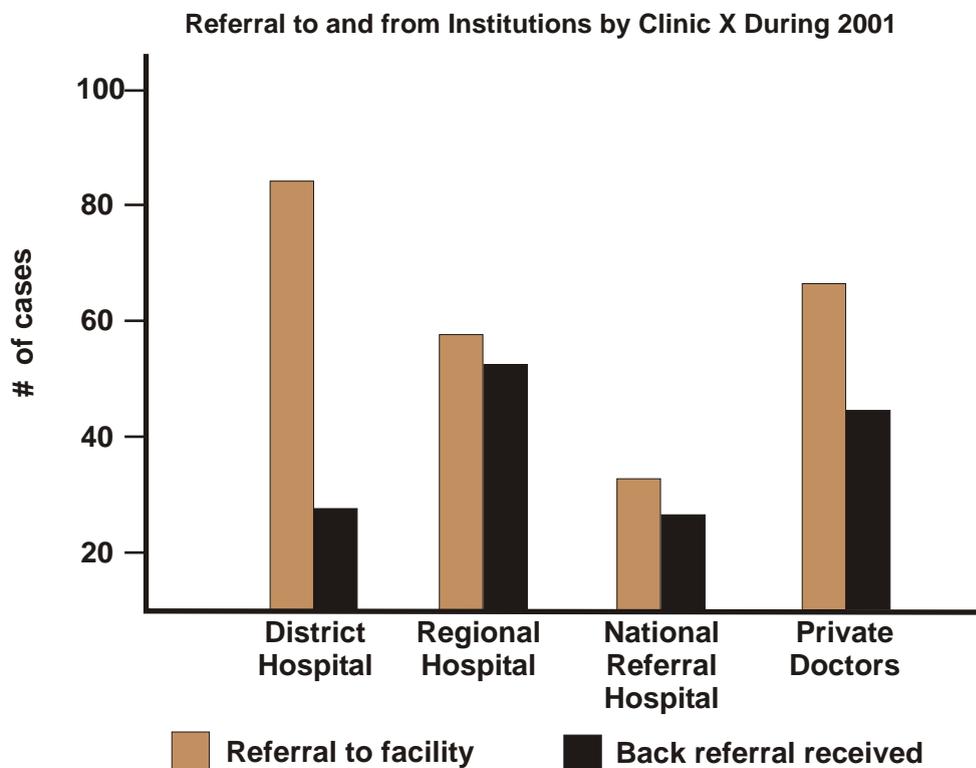
Name	Chronic care case load
<b>Definition</b>	Percentage of clients attending the clinic for chronic conditions.
<b>Calculation</b>	<b>Numerator:</b> Number of clients with chronic illnesses. <b>Denominator:</b> Headcount >5 years (chronic illness in young children is rare).
<b>Rationale</b>	This shows the proportion of chronic care patients in the facility. These may be locally further sub-divided according to category - e.g. Diabetes, Hypertension, Epilepsy, Arthritis, Chronic Obstructive Airways Disease etc.
<b>Data Source</b>	Registers - these need to include detailed disease categories.
<b>Actions to Consider</b>	Low chronic care caseloads show that the facility is not providing comprehensive care. Staff should be trained and appropriate medicines provided. High case loads will need careful assessment of type of medicines used, as chronic care is very expensive, and costs can be reduced by rational prescribing.
<b>Other Possible Indicators</b>	Incidence of new cases put on treatment shows the incidence of new clients coming for treatment. Population rates for specific chronic diseases (e.g. psychiatric illness, diabetes, hypertension, epilepsy) will show the proportion of chronic diseases coming for treatment. Proportion of each chronic disease coming for treatment is clearly shown in a pie diagram which should be done annually. Proportion of facilities stocking chronic medicines or having them in stock, will show where chronic diseases can (or can not) be treated. Referral rates show how many chronic clients are considered to be beyond the scope of the facility. % chronic patients seen by doctors shows how much of the chronic disease services have been decentralised to local nurses.

**Clinic X Case Mix for 2001**



Hypertension is obviously a major problem in this population. Special clinic days, outreach to communities, weight reduction and blood pressure control are priority activities.

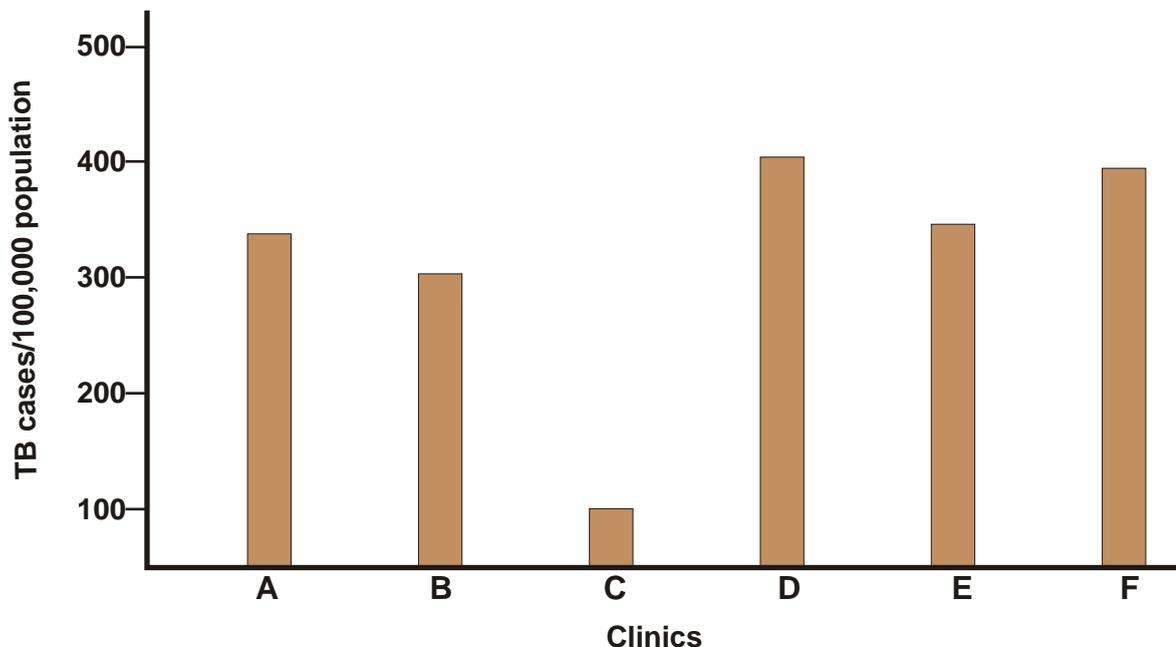
Name	Percentage of referrals made to the doctor
<b>Definition</b>	The proportion of all the clients coming to the facility who are actually referred to the doctor
<b>Calculation</b>	<b>Numerator:</b> Number of referrals to doctor <b>Denominator:</b> Total headcount.
<b>Rationale</b>	To assess the proportion of cases seen by doctors. Normally nurses can deal with 90% or more of all cases and should be encourage to do so if properly trained.
<b>Data Source</b>	Tick register, other registers or tally sheets.
<b>Normal Range</b>	Normally 10% of all patients need to be seen by a doctor.
<b>Actions to Consider</b>	A high referral rate means that nurses are not being used to their full potential, or are not adequately trained or equipped. This is a very expensive gap. Many local authorities do not keep even the most simple chronic medication and this may be shown in a high referral rate.
<b>Other Possible Indicators</b>	Ratio of patients seen by doctor and nurse Type of doctor referred to e.g. Referrals to other higher level. Percentage of back-referral letters received shows the proportion of referred patients for whom referral letters were received by the facility, If it is not 100% you should speak to the hospital. Internal referrals compared to external referrals.



The supervisor needs to visit the District Hospital and convince the Medical Superintendent to insist on back referral letters to be sent by medical doctor. A circular to private doctors should inform them that further referrals to their practise will not be made unless feedback is received by the clinic.

Name	Tuberculosis treatment prevalence
<b>Definition</b>	This shows the proportion of the population under treatment for TB.
<b>Calculation</b>	<b>Numerator:</b> TB patients currently under treatment. <b>Denominator:</b> Adult (over 15 years) target population.
<b>Rationale</b>	TB prevalence shows the proportion of the population under active treatment which can be compared to the expected prevalence rate.
<b>Normal Range</b>	This should be at least three per thousand, based on known high prevalence in South Africa. It should be higher in many areas such as the Western and Eastern Cape.
<b>Common Problems</b>	This indicator is often not taken seriously at facility level - TB treatment is the most important PHC task in SA at the moment! Only people on active treatment - i.e. those taking daily treatment - should be entered. Patients who have not been seen for two months or more should be reclassified as interrupters and should be removed from this category.
<b>Data Source</b>	Active TB blue cards are the best source. Use the TB register only if it is up to date.
<b>Actions to Consider</b>	If this number is low (<3 per 1,000) you need to be suspecting TB in more of your clients (see suspect TB).
<b>Other Possible Indicators</b>	Other quarterly TB indicators such as new pulmonary TB (PTB) incidence, bacteriology completion, interrupters, transfers. Chronic respiratory complaints amongst chronic patients - suspect TB rate.

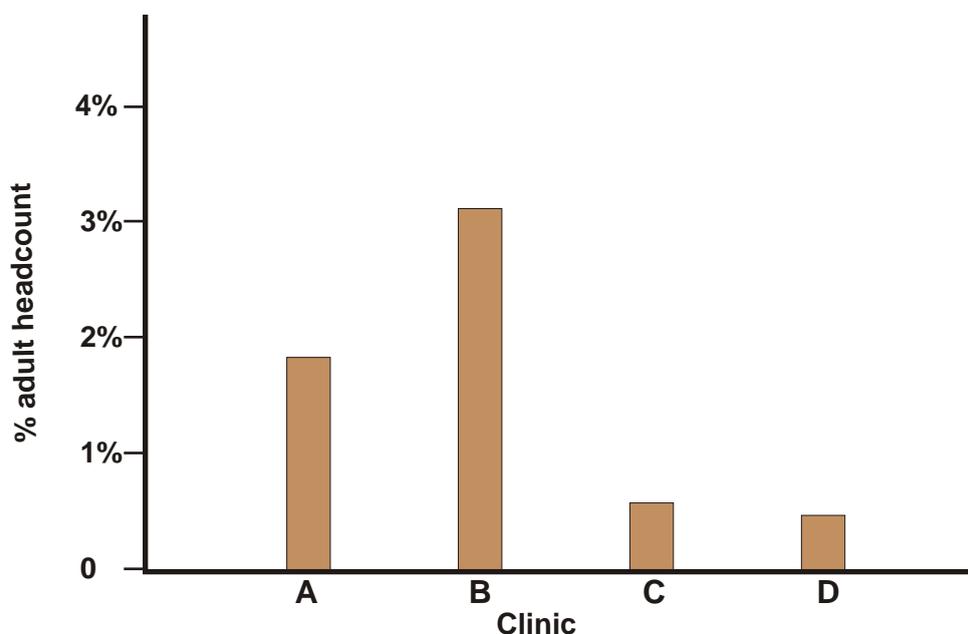
**TB Cases Under Treatment/100,000 Population**



Why does Clinic C have so few TB cases under treatment? Are they looking for new cases? Or is their catchment population significantly over-estimated?

Name	Tuberculosis suspect rate
Definition	Proportion of adult clients who are suspected of having TB and whose sputum is sent for sputum tests.
Calculation	<b>Numerator:</b> TB suspects with sputum sent. <b>Denominator:</b> Headcount over five years.
Rationale	TB is an epidemic in South Africa and needs to be actively looked for in the community by sending sputum for testing. All patients with a cough for over a month or weight loss need to be tested.
Normal Range	0.5% of all adults in the community have TB, at least 1-2% of those coming to the clinic should be tested - this indicator should be at least 1% of the headcount over 5 years.
Common Problems	Nurses do not think of TB often enough. Suspect TB cases are not sent for TB sputum examination. When sputa are sent, results do not come back.
Data Source	TB register, or some tick register.
Actions to Consider	Low rates of suspect tracing shows that staff are not actively looking for TB, and need to be encouraged.
Other Possible Indicators	Population suspect TB rate is the proportion of the adult population who is sent for TB sputum examination. TB suspects amongst patients shows the proportion of all curative patients who are tested for TB. This should be >5%.

**TB Suspect Rate  
Sputum sent for TB test**



TB suspect rate should be 1-2% of adult headcount. Clearly, Clinics C and D are not looking hard enough for patients with chronic cough. Clinic B may be over diagnosing suspect TB - if the rate of positive tests received from the lab is lower than 10% of sputa sent, then Clinic B needs to be more selective.



## Monthly Indicators for Management of TB

Indicator Name	Numerator	Denominator	Type
Suspected TB incidence	Suspected TB cases with sputum sent:	Target population 12 years and older	Units/1,000
Suspected TB rate	Suspected TB case	PHC headcount 5 years and older	%
New PTB smear + rate	TB case diagnosed – new	Suspected TB case	%
Tuberculosis treatment prevalence	TB patients currently under treatment	Target population	Units/1,000
MDR rate	Number of MDR cases	Number of tuberculosis cases under treatment:	%
Tuberculosis suspender rate	TB suspend – new	TB patient under treatment:	%
Tuberculosis suspender restart rate	TB suspend – restarted	TB suspender – new	%
Successful treatment rate – all PTB	PTB cases cured or completed treatment	Known PTB outcomes	%
Treatment failure rate – all PTB	Outcome – PTB failure	New smear+ PTB where treatment started – total	%
Interruption rate – all PTB	Outcome – PTB interrupted	Known PTB outcome	%
Transferred out rate – all PTB	Outcome – PTB transferred out	Known PTB outcome	%
% of Rifam/INH/PZA/Ethamb out	Rifam/ NH/PZA/Ethamb out of stock	Tracer item reports received	%
% of Rifampicin/INH out	Rifampicin/INH out of stock	Tracer item reports received	%

# Appendix C

## Eastern Cape Provincial PHC Essential Data Set

PHC headcount under 5 years
PHC headcount 5 years and older
DOTS visit – facility
Nurse clinical work days (PHC)
First antenatal visit
Follow-up antenatal visit
Tetanus Toxoid 3 <sup>rd</sup> /booster dose to pregnant woman
Live birth
Live birth under 2500gr
Delivery to women under 18 years
Still birth
Oral pill cycle
Nuristerate injection
Depo-provera/Petogen injection
IUCD inserted
Condoms distributed
Referred for termination of pregnancy
Diarrhoea under 5 years – new
Lower respiratory infection under 5 years – New
Child under 5 years weighed
Not gaining weight under 5 years
Severe malnutrition under 5 years – new
PEM client under 5 years
BCG at birth
DTP-Hib 1 <sup>st</sup> dose
DTP-Hib 2 <sup>nd</sup> dose
DTP-Hib 3 <sup>rd</sup> dose
OPV 1 <sup>st</sup> Dose
OPV 2 <sup>nd</sup> Dose
OPV 3 <sup>rd</sup> Dose
HepB 1 <sup>st</sup> Dose
HepB 2 <sup>nd</sup> Dose
HepB 3 <sup>rd</sup> Dose
Measles 1 <sup>st</sup> dose at 9 months
Immunised fully under 1 year – new
Suspected TB case
TB patient under treatment
TB patient on DOTS – facility
TB patient on DOTS – community
Case treated as STI – new
Male urethral discharge – new
STI contact slip issued
STI contact treated – new
Mental health visit
Violence against women
Psychiatric illness visit
Chronic care visit
Diabetes mellitus visit
Hypertension visit
Epilepsy visit

## HIV - Related Data

HIV counselled refusing HIV test
HIV counselled test done
HIV positive test
INH eligible HIV positive client
INH started – new
INH completed 6 months – new
INH discontinued – new
INH receiver this month – total
Co-trimoxazole eligible client started – new
Co-trimoxazole receiver this month – total
Pregnant women test for HIV
Pregnant women test for HIV positive
Pregnant women test for HIV positive accepts Nevirapene
Pregnant women test for HIV pos collects NVP tab at 32-34 wk
Pregnant women test for HIV pos reported taken NVP at labour/delivery
Pregnant women test for HIV pos whose infant received liquid NVP
Pregnant women test for HIV pos who received infant formula
Infant of HIV positive woman HIV tested at 9 months or later
Infant of HIV positive woman tested HIV positive at 9 months or later



## NOTES AND DEFINITIONS

These notes refer to the form for mapping a clinic catchment area on the facing page.

1. Indicate the name of the health facility.
2. Authority: for example local government, provincial, district council, NGO, Private.
3. Tick type of health facility visited for mapping: clinic, health centre, mobile clinic stop, subdistrict community hospital (a hospital in a magisterial district which is not designated as the district hospital), district hospital.
4. Persons providing information: write position of all those who helped define the catchment area for example chief professional nurse and professional nurse.
5. Locality: name each locality on a separate line. This could be a village, an area, a suburb, a block, or a township.
6. Indicate approximate proportion of total patients: on five-point scale of clinic patients who came from each locality, for example most, very many, many, few, very few or 5,4,3,2, 1.
7. Distance in kilometers: estimated (along a road a taxi fare might give an estimate of distance).
8. Time taken and method: for example one hour walking or 10 minutes by taxi.
9. Estimated number of homesteads in the locality. (Village leaders might know more accurately if they have done a census).
10. Estimated population: give approximate guess. This will be rewritten when the census is published.
11. Source water: for example river, spring, dam or pond, borehole.
12. Electricity: Write yes, if available; no, if none.
13. Useful information: for example bus stop, taxi rank, name of chief or chairperson resident committee, community health worker's name, whether near to another clinic or hospital.

Design and layout:  
Cathleen Fourie, MSH/EQUITY Project

