**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFP</td>
<td>Acute Flaccid Paralysis</td>
</tr>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>ARV</td>
<td>Anti Retro Viral</td>
</tr>
<tr>
<td>CBDA</td>
<td>Community Based Distribution Agent</td>
</tr>
<tr>
<td>CDC</td>
<td>Centre for Disease Control</td>
</tr>
<tr>
<td>CH</td>
<td>Central Hospital</td>
</tr>
<tr>
<td>CHAM</td>
<td>Christian Hospital Association of Malawi</td>
</tr>
<tr>
<td>CHAMS</td>
<td>Christian Hospital Association of Malawi Secretariat</td>
</tr>
<tr>
<td>CHD</td>
<td>Community Health Diary</td>
</tr>
<tr>
<td>CHSU</td>
<td>Community Health and Science Unit</td>
</tr>
<tr>
<td>CMS</td>
<td>Central Medical Stores</td>
</tr>
<tr>
<td>CoC</td>
<td>Code of Conduct</td>
</tr>
<tr>
<td>CS</td>
<td>Caesarean Section</td>
</tr>
<tr>
<td>CWIQ</td>
<td>Core Welfare Indicator Questionnaire Survey</td>
</tr>
<tr>
<td>DHIMC</td>
<td>District Health Information Management Committee</td>
</tr>
<tr>
<td>DHIS</td>
<td>District Health Information Software</td>
</tr>
<tr>
<td>DHMT</td>
<td>District Health Management Team</td>
</tr>
<tr>
<td>DHO</td>
<td>District Health Office / Officer</td>
</tr>
<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
</tr>
<tr>
<td>DIP</td>
<td>Development Partners</td>
</tr>
<tr>
<td>DISTMS</td>
<td>Department of Information System and Technology Management Services</td>
</tr>
<tr>
<td>DOP</td>
<td>Director of Planning</td>
</tr>
<tr>
<td>EHP</td>
<td>Essential Health Package</td>
</tr>
<tr>
<td>EP&amp;D</td>
<td>Economic Planning and Development</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographical Information System</td>
</tr>
<tr>
<td>GoM</td>
<td>Government of Malawi</td>
</tr>
<tr>
<td>GPS</td>
<td>Geographical Positioning System</td>
</tr>
<tr>
<td>GWAN</td>
<td>Government Wide Area Network</td>
</tr>
<tr>
<td>HC</td>
<td>Health Centre</td>
</tr>
<tr>
<td>HFIMC</td>
<td>Health Facility Information Management Committee</td>
</tr>
<tr>
<td>HIMS</td>
<td>Health Information Management Secretariat</td>
</tr>
<tr>
<td>HIMTC</td>
<td>Health Information Management Technical Committee</td>
</tr>
<tr>
<td>HMIS</td>
<td>Health Management Information System</td>
</tr>
<tr>
<td>HIPC</td>
<td>Health Information Policy Committee</td>
</tr>
<tr>
<td>HIS</td>
<td>Health Information System</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>HMIS</td>
<td>Health Management Information System</td>
</tr>
<tr>
<td>HSA</td>
<td>Health Surveillance Assistant</td>
</tr>
<tr>
<td>IDS</td>
<td>Integrated Disease Surveillance</td>
</tr>
<tr>
<td>IFMIS</td>
<td>Integrated Financial Management Information System</td>
</tr>
<tr>
<td>IHS</td>
<td>Integrated Household Survey</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>LBW</td>
<td>Low Birth Weight</td>
</tr>
<tr>
<td>LMIS</td>
<td>Logistic Management Information System</td>
</tr>
<tr>
<td>LQAS</td>
<td>Lot Quality Assurance Sampling</td>
</tr>
<tr>
<td>M &amp; E</td>
<td>Monitoring and Evaluation</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>MOHP</td>
<td>Ministry of Health and Population</td>
</tr>
<tr>
<td>MOLG</td>
<td>Ministry of Local Government</td>
</tr>
<tr>
<td>MoU</td>
<td>Memorandum of Understanding</td>
</tr>
<tr>
<td>MPRS</td>
<td>Malawi Poverty Reduction Strategy</td>
</tr>
<tr>
<td>MTEF</td>
<td>Medium Term Expenditure Framework</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental Organisation</td>
</tr>
<tr>
<td>NSO</td>
<td>National Statistical Office</td>
</tr>
<tr>
<td>OPD</td>
<td>Out Patient Department</td>
</tr>
<tr>
<td>ORT</td>
<td>Other Recurrent Transactions</td>
</tr>
<tr>
<td>OVI</td>
<td>Objectively Verifiable Indicator</td>
</tr>
<tr>
<td>PAMIS</td>
<td>Physical Assets Management Information System</td>
</tr>
<tr>
<td>PMTCT</td>
<td>Prevention of Mother To Child Transmission</td>
</tr>
<tr>
<td>PPPIS</td>
<td>Pension, Payroll and Personnel Information System</td>
</tr>
<tr>
<td>RHIMIS</td>
<td>Routine Health Management Information System</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually Transmitted Infections</td>
</tr>
<tr>
<td>SWAp</td>
<td>Sector Wide Approach</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>TBA</td>
<td>Traditional Birth Attendant</td>
</tr>
<tr>
<td>VCT</td>
<td>Volunteer Counselling and Testing</td>
</tr>
<tr>
<td>VDC</td>
<td>Village Development Committee</td>
</tr>
<tr>
<td>VHC</td>
<td>Village Health Committee</td>
</tr>
<tr>
<td>WCBA</td>
<td>Women of Child Bearing Age</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
</tbody>
</table>
Table of contents
Abbreviations ........................................................................................................ 1
Preface .................................................................................................................... 4
1. Background ......................................................................................................... 5
2. Introduction .......................................................................................................... 7
  2.1. Why is this document needed? ...................................................................... 7
  2.2. Why is an information system required? ........................................................... 8
  2.3. What objectives are intended to be achieved through this information system? .. 8
  2.4. What principles are guiding the design of the health information system? .... 8
3. Institutional Set-up .............................................................................................. 9
  3.1. Health Information Policy Committee (HIPC) and its responsibilities .......... 9
  3.2. Health Information Management Technical Committee (HIMTC) and its
      responsibilities .................................................................................................... 9
  3.3. Health Information Management Secretariat (HIMS) and its responsibilities .... 10
  3.4. Health Information Management Committee at District and Facility Level .... 10
      3.4.1. Responsibility of DHIMC: ..................................................................... 11
      3.4.2. Responsibility of HFIMC: ..................................................................... 11
4. Standard setting ................................................................................................... 12
  4.1. Defining Minimum Datasets ......................................................................... 12
  4.2. Definition of Data Elements ......................................................................... 12
  4.3. Dimension of human health data collection ..................................................... 12
  4.4. Source of Data collection/compilation ............................................................. 12
  4.5. Quality Control .............................................................................................. 13
  4.6. Maintenance of national standard in the realm of decentralisation ................ 13
  4.7. Data Release protocol ................................................................................... 13
  4.8. IT Policy ......................................................................................................... 13
  4.9. Data Dictionary .............................................................................................. 13
5. Indicators ............................................................................................................ 14
6. Data sources for core indicators and their scope ............................................. 16
  6.1. Census ............................................................................................................ 16
  6.2. Birth and Death Registration ......................................................................... 16
  6.3. Surveys ........................................................................................................... 16
  6.4. Rapid assessment ........................................................................................... 16
  6.5. Integrated Sentinel sites ................................................................................ 17
  6.6. Research ......................................................................................................... 17
  6.7. Integrated Disease Surveillance (IDS) ............................................................. 18
  6.8. Pension Payroll and Personnel Information System (PPPIS) ....................... 18
  6.9. Integrated Financial Management Information System (IFMIS) ................. 18
  6.10. Physical Assets Management Information System (PAMIS) ...................... 18
  6.11. Logistics management information system (LMIS) .................................... 18
7. Data collection, compilation, conversion and storage ..................................... 19
  7.1. Data collection from primary source .............................................................. 19
  7.2. Data compilation from secondary sources ..................................................... 19
  7.3. Data conversion to information to knowledge ............................................... 19
  7.4. Data bank and safety measures .................................................................... 19
  7.4. Resource centres/Libraries .......................................................................... 19
8. Information flow .................................................................................................. 20
8. Geographic information system (GIS) ................................................................. 21
9. Dissemination ........................................................................................................ 22
  9.1. District health office ......................................................................................... 22
    9.1.1. Quarterly report ....................................................................................... 22
    9.1.2. Annual Report on District Health Services .............................................. 22
  9.2. Central hospital ................................................................................................. 22
  9.3. National level .................................................................................................... 22
    9.3.1. Quarterly Report ....................................................................................... 22
    9.3.2. Government Wide Area Network (GWAN) .............................................. 22
    9.3.3. Website ..................................................................................................... 23
    9.3.4. Publication of Health Statistical Report “Health of the Nation” ............ 23
    9.3.5. Report on request ..................................................................................... 23
10. Computerisation .................................................................................................... 24
    10.1. Data processing at DHO and CH levels ....................................................... 24
    10.2. Electronic Patient Register in CH ............................................................... 24
    10.3. Touch screen Patient Management Information System ............................ 24
    10.4. Electronic Patient Register in larger hospitals ............................................ 24
11. Strategies for the improvement of data quality and use ........................................ 26
    11.1. Integrated supervision ............................................................................... 26
    11.2. Involvement of civil society ........................................................................ 26
    11.3. Performance criteria for budget allocation .................................................. 26
    11.4. HMIS in regular training curriculum ............................................................ 26
    11.5. M & E in job description ............................................................................. 27
    11.6. Career path for health statistics profession ................................................. 27
    11.7. Reward for best practice ............................................................................ 27
    11.8. Practice based teaching .............................................................................. 27
    11.9. Disbursement by result ............................................................................... 27
12. Monitoring Framework ......................................................................................... 28
    12.1. Results and Dimensions ............................................................................. 28
    12.3. Routine Monitoring ...................................................................................... 30
    12.4. Monitoring Tools and Methods ................................................................... 30
      12.4.1. Individual family ................................................................................... 30
      12.4.2. Community level .................................................................................. 30
      12.4.3. Health Facility Catchment Area .............................................................. 31
      12.4.4. Health district ....................................................................................... 31
      12.4.5. National Level ....................................................................................... 31
    12.5. Evaluation / Annual performance review ..................................................... 31
      12.5.1. Annual Joint Review ............................................................................. 31
      12.5.2. Annual Joint Review Committee .............................................................. 32
      12.5.3. Annual Joint Review Process ................................................................. 32
      12.5.4. Content of Annual Joint Review .............................................................. 32
Annex 1: Objectively verifiable Indicators (OVI) for Measuring success of information system ........................................................................................................ 33
Annex 2: Glossary .................................................................................................... 35
Preface

Malawi is firmly committed to attaining an acceptable standard of health for its entire population within the shortest possible time. The Health Policy Framework 1995; “To the Year 2020: A Vision for the Health Sector in Malawi” 1999 and the National Health Plan 1999-2004 documents have clearly described national goals and periodic targets to achieve these goals. The country has made substantial progress towards the implementation of sector-wide approach and decentralisation of management essential health care services to district assembly.

In order to achieve national targets, monitoring of programme performance on a regular basis is one of the most critical management functions, which requires reliable information in a timely manner.

The Ministry of Health and Population (MOHP) has implemented a comprehensive and integrated routine Health Management Information System (HMIS) in the entire country from January 2002. This system is guided by the principles of integration of all routine information systems, decentralisation in information generation and use, information for action and simple to establish and maintain. The integrated HMIS is designed to provide programme managers and staff with reports on how well each programme is functioning and to alert the service providers and programme managers to take timely necessary corrective actions.

The routine information system alone cannot supply complete information that is required by the health sector. Surveys and research play important roles in acquiring required information for planning and management of health services.

This document intends to provide policy and strategic framework for management of health information, use of information in planning and management of health services and monitoring health sector performance and periodic reviews.

Dr. Richard Pendame
Secretary for Health and Population
August 2003
1. Background

The Health Information System (HIS), which was intended to provide information on preventive and curative services, had been unable to do so in a timely and useful manner. In response to HIS’ inability to provide information, parallel reporting systems were evolved, primarily along vertical programme lines. The time and effort involved in operating an information system were taking away from a programme officer’s other responsibilities. Parallel systems duplicated efforts in processing, training, and operating the system and often produced different conflicting data. The major problems of all information systems were identified and clear directions were spelled out in long-term policy and five-year plan\(^1\). Both the policy and plan aimed at integrating existing information systems into a flexible, accessible, comprehensive Health Management Information System (HMIS) capable of feeding back useful information on a timely basis to those who need it most.

In the process of implementing government’s policies and plans, the Ministry of Health and Population (MOHP) took an inventory of existing information systems in 1999 and endorsed a strategy for the establishment of an integrated and comprehensive routine health management information system from early 2000.

The routine HMIS has been developed in a well-structured systematic way in the order of selection of indicator, development of data sets, development of instruments and reference manual, testing of tools and guidelines, nationwide launching, constant supervision, follow-up and feedback.

The focus of each and every step of development was geared towards the establishment of an information culture. As soon as the minimum set of indicators were agreed, the district health management team (DHMT) was oriented to start improving the quality of existing data and using them in bettering management functions.

---

\(^1\) Refer to a) To the year 2020: A vision for the Health Sector in Malawi, b) Malawi National Health Plan 1999-2004.
Once the tools and procedures were approved for nationwide implementation, all health and support personnel in the country were oriented on HMIS tools and procedures. The HMIS team in headquarters have received appropriate training abroad to provide required support to the periphery. Data processing at district and central level has been computerised. Software that has evolved over almost a decade in South Africa has been adapted for Malawi to process the data. Maps have been digitised showing the catchments area of each public health facility in the entire country for use in planning and monitoring of health services by districts and facilities. Numerous innovation are tried to improve the quality and use of information. It has been noted that remarkable achievements have been made in the establishment of HMIS in the country. However, there are some old outstanding issues that have not yet been resolved and some new issues have evolved as a result of progress made in health sector reform process. This document provides broader policy and strategic framework for management of information required for policy and programme planning and management of services in the health sector.
2. Introduction

Health information is an integral part of national health system. It is a basic tool of management and a key input for the improvement of the health status in the country. The primary objective of the information system is to provide reliable, relevant, up-to-date, adequate, timely and reasonably complete information for health managers at community, facility, district and national levels. In brief, components of information, their main usage and sources can be summarised as follows:

The health information system provides information on:
- Demography
- Vital events
- Health status: morbidity, mortality, disability, and quality of life
- Utilisation of health services: service coverage, attendance, admission etc.
- Health resources: facilities, beds, human resources, transport, communication etc.
- Health financing
- Environmental health
- Supplies: drugs, vaccines, medical equipment and other important stuffs

The information compiled on aforementioned subjects is used to:
- Measure the health status of the people
- Quantify the health problems
- Quantify the medical and health care needs
- Formulate health policies, plans and strategies
- Set priorities
- Design health interventions
- Monitor trends, and changes
- Assess progress
- Evaluate effectiveness and efficiency of health services

The information required for predefined use as mentioned above is obtained from the following sources:
- The census
- The registration of vital events
- Health facility based records
- Community monitoring reports
- Population surveys and researches

Thus the health information system constitutes an active interface of informative materials, providers, users and methods of communication.

2.1. Why is this document needed?

The main purpose of this document is to:
- Identify health sector’s information needs,
- Make the required information available,
- Ensure the reliability of available information,
iv. Ensure the accessibility of available information to all users,
v. Foster the use of information in policy and programme planning as well as routine monitoring and annual reviews,
vi. Convert data to information to knowledge,
vii. Properly manage the information,
viii. Regulate collection and dissemination of health information.

2.2. Why is an information system required?
The main mission of the health information system is to improve the health status of the people through increasing effectiveness and efficiency of health services. The increased efficiency is achieved through rational management and policy decisions. The management and policy decisions can be rationalised through appropriate use of information.

2.3. What objectives are intended to be achieved through this information system?
i. The first and the main objective of information system is to ensure that the required health and management information are available to all users in the health sector to meet each of their predefined needs.
ii. The second objective of the information system is to ensure that the required information is accessible to all concerned users.
iii. The third objective of the information system is to ensure that the intended primary users of the information are informed about the information. (The individual and organisations involved in delivering and managing health services and providing support to this effect are the primary users of information).

The first and the second objectives focus on information as an informative material and the third objective focuses on information as process, knowledge and being informed. The achievements of these different levels of objectives will be measured using appropriate indictors defined in the log-frame given in the end of this document.

2.4. What principles are guiding the design of the health information system?
The design of health information system has been guided by the principles of:
- Data for decision-making
- Integration of management of health service specific routine information systems into a single system
- Data collection for local analysis and use
- Data collection, analysis and use by the same health and support personnel who are responsible for the management/delivery of health services
- Complete information available at single repository
- Strong link between all data collection systems in order to avoid duplication and produce synergy in data analyses and dissemination.
3. Institutional Set-up

Management of health information is a sensitive matter. Collection, aggregation, processing, and dissemination of information need policy direction and quality control measures. The following institutional arrangements are made for effective management of health information in the country.

3.1. Health Information Policy Committee (HIPC) and its responsibilities

Policy on data collection, data management, and data distribution will be devised by a Health Information Policy Committee (HIPC) which consists of the following members:

- Director: Planning Department, MOHP - chair
- Director: CHAM Secretariat – co-chair
- Representative from the Ministry of Local Government - member
- Representative from EP and D - member
- Representative from NSO - member
- Director: Centre for Social Research, University of Malawi - member
- Nominee from Health and population donor group - member

The Committee will be responsible for approving the policy pertaining to:

i. Minimum dataset for health sector,
ii. Measurement unit and definition of data elements,
iii. Data standards,
iv. Data access and data release protocol,
v. Main source for the collection of data on each element,
vi. Coordination of health data collection activities carried out by EP&D, NSO, MOHP, donors, NGOs, and all others to ensure data standard, data uniformity, to avoid duplication etc.

3.2. Health Information Management Technical Committee (HIMTC) and its responsibilities

A health information management technical committee will deal with all technical issue of management of health information in the country. The committee will be chaired by the Director of Planning (DOP) in which directors of all departments and officer-in-charges of CHSU and CMS will be members. The current HMIS unit will be converted to HIMS secretariat and the head of the secretariat will report to the HIMTC through DOP.

The main function of the committee will be as follows:

i. Defining minimum data set and their definitions,
ii. Periodic review of health data collection procedures and tools
iii. Identifying integrated sentinel sites for all purposes,
iv. Setting operational research priority and approving operational research proposals,
v. Overseeing data processing, storage, and dissemination functions carried out by HIMS secretariat,
vi. Overseeing the quality of data collected at all levels by all parties in the country and devising quality control measures,

vii. Approving annual report ‘Health of the Nation’ for release,

viii. Assessing use of information in planning and management of health services at all levels and by all departments and devising measures for better use,

ix. Assessing the departmental routine monitoring and annual and other periodic evaluation functions and providing feedback for improvements,

x. Reviewing information policy, strategy and plans and submit to HIPC for approval,

xi. Any other functions deemed necessary for improvement of quality of data and use.

3.3. Health Information Management Secretariat (HIMS) and its responsibilities

The current HMIU unit will be converted into health information management secretariat. The HIMS will serve as secretariat for both the HIMTC and HIPC. The head of the secretariat will report to the both committee through the chair. The HIMS will have the following functional responsibilities:

i. Act as secretariat for both the HIPC and HIMTC,

ii. Implementing the decisions made by HIPC and HIMTC,

iii. Maintaining health data bank and health information resource centre (library) obtaining data from all sources approved by HIPC,

iv. Supply of HMIS tools,

v. Generating quarterly monitoring reports using data from both the primary and secondary sources and disseminating them to target audience through all possible channels,

vi. Compiling data from all available sources for annual joint review,

vii. Preparing annual review report on health sector indicators and submit to HIMTC for approval,

viii. Generate report on request for government’s departments and donors,

ix. Plan, print and supply approved routine data collection tools for all districts and central hospitals,

x. Plan and conduct practice based training for all health personnel on data collection, processing, dissemination and use,

xi. Any other functions deemed necessary for the improvement of quality of data and use.

3.4. Health Information Management Committee at District and Facility Level

Extended DHMT will act as ‘District Health Information Management Committee’ (DHIMC). Similarly, each health facility will form a three to five member Health Facility Information Management Committee (HFIMC).

The main role and responsibility of both committees will be to ensure proper management of health information and sufficient use of information in planning and management of health services at respective levels. Specific responsibilities are elaborated in the following sub-sections:
3.4.1. Responsibility of DHIMC:
   i. To ensure availability of all data collection, processing, monitoring and reporting tools at each health facility with a buffer stock of 5 months supply at DHO,
   ii. To manage supply of health passport booklets through revolving funds,
   iii. To ensure all health personnel involved in data management are properly and adequately orientated on data collection, processing and use,
   iv. To oversee data collection, processing, dissemination and reporting functions carried out at facility and DHO level in order to ensure that data is accurate, complete, timely and reported/disseminated in appropriate format,
   v. To certify completeness and correctness of data in monthly, quarterly and annual reports for submission to district assembly and MOHP headquarters,
   vi. To provide feedback and on the job training to health facility personnel during routine supervision visit in order to enhance data quality and use at health facilities,
   vii. To ensure sufficient use of information in planning (need assessment, priority setting, resource allocation, target setting etc.) and management of health services including routine monitoring towards achievement of milestones and targets.
   viii. Any other functions deemed necessary for the improvement of quality of data and use.

3.4.2. Responsibility of HFIMC:
   i. To ensure availability of all data collection, processing, monitoring and reporting tools at least for 3 months,
   ii. To manage supply of health passport booklets through revolving funds according to the guidelines provided from DHO,
   iii. To ensure all health personnel involved in data management are properly and adequately orientated on data collection, processing and use,
   iv. To certify completeness and correctness of data in monthly, quarterly and annual reports for submission to DHO,
   v. To ensure sufficient use of information in day to day management of health services at facility,
   vi. Any other functions deemed necessary for the improvement of quality of data and use.
4. Standard setting

Information collection costs money. Before investing on information, the utility of information that has been proposed to be collected will have to be justified and approved by HIPC. The following procedures will be followed in this matter:

4.1. Defining Minimum Datasets
HIPC will approve minimum dataset required for planning, monitoring and evaluation in the health sector. The 110 health sector indicators will serve as the original minimum dataset. HIPC will be responsible for any amendment on this list.

4.2. Definition of Data Elements
HIPC will approve the definition of each data element included in the minimum dataset. Each data element will be defined on the following format:
- Name
- Unit
- Definition
- Discussion of purpose

Data to be collected on any element must be well defined and approved prior to commissioning the collection.

4.3. Dimension of human health data collection
Human data on minimum dataset will be collected on the following 5 dimensions.
- Time
- Place
- Age
- Tribe/Race
- Sex

Data collected on these dimensions determine the occurrences of a specific cause of problem in any place, at any time, by sex, by race, and by age.

4.4. Source of Data collection/compilation
Health information will be gathered from the following sources:
- Routine data that are collected during service delivery from all health facilities nationwide;
- Routine data that are collected during service delivery from selected sentinel sites only;
- Investigation and community based surveillance reports;
- Survey i.e., DHS, HIS, CWIQ;
- Operational research;
- Rapid assessments
- Management data from financial management, human resource management, drug management, logistic management, administration, physical facilities, transport management.
4.5. Quality Control
Accuracy of data will have to be certified by respective committee before sending the data to next level. This implies certification of data at health facility, district and national levels.

Routine data collected from health facilities, DHO, and MOHP and other agencies will not officially be released until the data supplier has had an opportunity to verify the accuracy of the data. Data verification report will be generated and circulated to all concerned for their verification. Generally, 30 days time will be given for submission of verified data.

4.6. Maintenance of national standard in the realm of decentralisation
After decentralisation of management of health services to district assembly each district will establish its own monitoring and evaluation system and collect data accordingly. As each district must collect data on minimum dataset using the same data definition in the entire country, revision of data collection form and data processing software will remain under the custodian of HIMTC.

4.7. Data Release protocol
Data elements will be classified into two categories namely unrestricted and restricted, which will be grouped based on the following criteria:

- **Unrestricted**: Information on minimum dataset will easily be available to all users in aggregated form only. Identification information of an individual case does not belong to this category. Researchers willing to analyse identification information will require written permission from HIM secretariat. HIMS will issue authorisation letter as per approved policy guidelines.

- **Restricted**: Data elements that require approval for release through the Data Release Protocol. The HMIPC will release list of restricted data, which will form part of this document.

4.8. IT Policy
The Ministry will develop its IT policy in consultation with DISTMS. Generally, the electronic equipment will be purchased from the same company and agreement will be made for maintenance. New purchase of computer will meet at least the following standards:

- Processor type: Pentium III
- Processor speed: 2.4 GHG
- Hard disk capacity: 20 GB
- Ram: 512

4.9. Data Dictionary
The data dictionary currently in use in DHIS will be regularly updated to cover the definition of all data elements that are included in the core indicators.
5. Indicators

A matrix of national core indicators for monitoring and evaluation of health sector performance and interpretation of each indicator is available in a separate book. The selection and construction of these indicators are coherent with objectives and targets set in vision 2020 document, SWAp implementation plan, EHP document and the programme of work 2003-2009. Classification of indicators on six performance dimensions (access, equity, quality, effectiveness, efficiency, sustainability), four logical hierarchy (input, output, outcome, impact), four service management and delivery levels (community, facility, district, national) and four levels of goals/objectives intended to monitor or evaluate (MDG, MPRS, SWAP, EHP) are included in the matrix. The following are the short names of indicators.

<table>
<thead>
<tr>
<th>Table 1: Health Sector Core Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. % of GoM budget allocated to health sector</td>
</tr>
<tr>
<td>2. Per capita total allocation (GoM and donor) to health sector (in US$)</td>
</tr>
<tr>
<td>3. Per capita drugs and medical supply budget</td>
</tr>
<tr>
<td>4. % of budget released to districts</td>
</tr>
<tr>
<td>5. Per capita contribution from cost sharing</td>
</tr>
<tr>
<td>6. Annual output of training health personnel</td>
</tr>
<tr>
<td>7. % of established positions filled</td>
</tr>
<tr>
<td>8. Health workers: population ratio</td>
</tr>
<tr>
<td>9. % of health centres with minimum staff norms. (2 nurses +1 doctor or CO or MA)</td>
</tr>
<tr>
<td>10. Doctors and nurses: hospital bed ratio</td>
</tr>
<tr>
<td>11. Health personnel attrition rates</td>
</tr>
<tr>
<td>12. % of HMIS report received</td>
</tr>
<tr>
<td>13. % health centres with functional health centre committee</td>
</tr>
<tr>
<td>14. % of DHO supervised by zonal officers using integrated supervision checklist</td>
</tr>
<tr>
<td>15. % of facilities supervised by DHMT members using integrated supervision checklist</td>
</tr>
<tr>
<td>16. % of donors signing and adhering to MoU and CoC</td>
</tr>
<tr>
<td>17. % health centres with functioning water, electricity and communication</td>
</tr>
<tr>
<td>18. % of clients fully satisfied with services</td>
</tr>
<tr>
<td>19. Care seekers average waiting time</td>
</tr>
<tr>
<td>20. Bed utilisation rate</td>
</tr>
<tr>
<td>21. % of health facilities up to physical standard</td>
</tr>
<tr>
<td>22. % of health facilities up to equipment standard</td>
</tr>
<tr>
<td>23. % of health facilities without any stock outs of SP, ORS and Cotrimoxazole for more than a week at a time</td>
</tr>
<tr>
<td>24. Population:ambulance ratio</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Indicator</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>51. % of newborn treated for complications</td>
</tr>
<tr>
<td>52. % of postpartum care within 2 weeks of delivery</td>
</tr>
<tr>
<td>53. % of WRA receiving family planning services</td>
</tr>
<tr>
<td>54. Contraceptive prevalence rate</td>
</tr>
<tr>
<td>55. % of fully immunised under one child</td>
</tr>
<tr>
<td>56. % of under one children immunised by each antigen</td>
</tr>
<tr>
<td>57. Vitamins A coverage amongst 6-59 month population</td>
</tr>
<tr>
<td>58. U5 population treated for ARI</td>
</tr>
<tr>
<td>59. U5 ARI death rate</td>
</tr>
<tr>
<td>60. U5 population treated for Diarrhoea</td>
</tr>
<tr>
<td>61. Under 5 diarrhoeal death rate</td>
</tr>
<tr>
<td>62. % of under weights amongst under five attending clinics</td>
</tr>
<tr>
<td>63. Prevalence of underweight children (under five years of age)</td>
</tr>
<tr>
<td>64. Under 5 malnutrition death rate</td>
</tr>
<tr>
<td>65. <strong>TB detection rate per 100,000 population</strong></td>
</tr>
<tr>
<td>66. Smear negative and extra-pulmonary TB cases treatment completion rate</td>
</tr>
<tr>
<td>67. Cure rate among smear positive TB cases (Under Directly Observed Treatment Short Course)</td>
</tr>
<tr>
<td>68. Tuberculosis death rate</td>
</tr>
<tr>
<td>69. U5 population treated for malaria</td>
</tr>
<tr>
<td>70. 5 &amp; over population treated for malaria</td>
</tr>
<tr>
<td>71. All age population treated for malaria</td>
</tr>
<tr>
<td>72. U5 malaria death rate</td>
</tr>
<tr>
<td>73. 5 &amp; over malaria death rate</td>
</tr>
<tr>
<td>74. Malaria death rate: all age</td>
</tr>
<tr>
<td>75. % of Malaria cases over the total OPD attendance</td>
</tr>
<tr>
<td>76. Insecticides treated mosquito nets distribution rate</td>
</tr>
<tr>
<td>77. Population sleeping under ITN</td>
</tr>
<tr>
<td>78. Incidence of neonatal tetanus</td>
</tr>
<tr>
<td>79. Cholera incidence rate per 1000 pop</td>
</tr>
<tr>
<td>80. Cholera death rate per 1000 cases</td>
</tr>
<tr>
<td>81. Measles incidence rate per 100,000 pop</td>
</tr>
<tr>
<td>82. AFP incidence rate per 100,000 pop</td>
</tr>
<tr>
<td>83. Ebola incidence rate 100,000 pop</td>
</tr>
<tr>
<td>84. Meningococal Meningitis incidence rate per 100,000 pop</td>
</tr>
<tr>
<td>85. Plague incidence rate 100,000 pop</td>
</tr>
<tr>
<td>86. Rabies incidence rate 100,000 pop</td>
</tr>
<tr>
<td>87. Yellow fever incidence rate 100,000 pop</td>
</tr>
<tr>
<td>88. Population treated for dysentery</td>
</tr>
<tr>
<td>89. Dysentery death rate per 1000 cases</td>
</tr>
<tr>
<td>90. Population treated for eye infections</td>
</tr>
<tr>
<td>91. Population treated for ear infections</td>
</tr>
<tr>
<td>92. Population treated for skin infections</td>
</tr>
<tr>
<td>93. Population treated for oral conditions</td>
</tr>
<tr>
<td>94. Population treated for schistosomiasis</td>
</tr>
<tr>
<td>95. Leprosy case per 100,000 population</td>
</tr>
<tr>
<td>96. Population treated for common injures and wounds (excluding road accidents)</td>
</tr>
<tr>
<td>97. Number of road accident cases</td>
</tr>
<tr>
<td>98. Road accident death rate per 1000 cases</td>
</tr>
<tr>
<td>99. Ten most frequent cause of OPD attendance</td>
</tr>
<tr>
<td>100. Ten most frequent cause of hospital admission</td>
</tr>
<tr>
<td>101. Ten most frequent cause of inpatient death</td>
</tr>
<tr>
<td>102. Inpatient death rate (excluding maternity) per 1000</td>
</tr>
<tr>
<td><strong>103. OPD utilisation rate per 1000 pop</strong></td>
</tr>
<tr>
<td>104. Total fertility rate</td>
</tr>
<tr>
<td>105. Life expectancy</td>
</tr>
<tr>
<td>106. Neonatal mortality rate</td>
</tr>
<tr>
<td>107. Infant mortality rate</td>
</tr>
<tr>
<td>108. Under-five mortality rate</td>
</tr>
<tr>
<td>109. Maternal mortality ratio</td>
</tr>
<tr>
<td>110. Crude death rate</td>
</tr>
</tbody>
</table>

(Note: The indicators shown in bold are selected for annual health sector joint reviews.)

The construction of each indicator with numerator and denominator data elements, intended level and dimension of monitoring, main data source for each data element are described in ‘monitoring health sector in Malawi’.
6. Data sources for core indicators and their scope

The health system obtains required information from several direct sources as well as other systems within and outside the health sector as elaborated in the following subsection:

**6.1. Census**

The population data is the foundation of health management information system. Up to date population figures must be available for each village, health facility catchment area, health district and for the entire country in order to plan health services and measure changes. Health system in Malawi will continue to obtain population data from the national census. Target population for each year will be projected for each level using the inter-census growth rate for that particular level. The Ministry of Health and Population will provide its population data requirements to the National Statistics Office in order to incorporate in the decennial census.

**6.2. Birth and Death Registration**

The current vital registration in the country is a voluntary system and therefore doesn’t capture total events. Births and deaths that take place at a health facility are recorded in ward (inpatient) registers, but there is no mechanism to capture the events that are taking place in the communities. The vital registration could be one of the core administrative functions of VDCs when the decentralisation and devolution concepts start fully functioning. The Ministry of Health and Population will coordinate with Registrar General’s Department, EP&D, NSO, MOLG and other relevant organisations to have the vital registration system in place nationwide.

**6.3. Surveys**

Surveys will be the main source for collection of population data on health outcome and impacts indicators. The [DHS will be the main household survey](#) to be carried out in every four year. Information on the following impact indicators will be generated from the DHS.

- Life expectancy
- Total fertility rate
- Crude death rate
- Maternal mortality rate
- Infant mortality rate
- Under five mortality rate
- Neonatal mortality rate

Other information will also be included in the survey to verify the quality of information generated from routine sources and additional information that are not routinely available.

**6.4. Rapid assessment**

Surveys are very expensive methods of data collection. Therefore, several rapid assessments will be carried out ad hoc in order to furnish quantitative and qualitative data on concurrent health issues. Specifically, exit interview on client satisfaction or perception, observation on quality of care, facility based record review for age/sex and morbidity and mortality data, LQAS (Lot Quality Assurance Sampling) for health workers performance will be done annually.
6.5. Integrated Sentinel sites
Quality of data that is collected by facilities having limited human resource capacity is generally poor. Sometimes, it is difficult to assess the degree of reliability of data collected by some facilities. National estimates derived from such data can lead the country’s programme to wrong direction. Therefore, it is necessary to establish a system that provides cross check to countrywide data as well as generates more accurate data to come up with national estimates. To this effect, a number of health facilities will be identified as integrated sentinel sites meeting the following criteria/standards:

- Ratio of nurse to the population less than 4000.
- Ratio of clinical person (MO/CO/MA) to the population less than 10,000.
- Ratio of HSA (at work) to the population less than 1500.
- Provision of outpatient, reproductive health, child health, HIV/AIDS services.
- Provision of malaria, TB, leprosy and HIV testing.
- Accessible by road in all seasons.

Sentinel sites and all other health facilities in the entire country will use the same data collection, compilation and reporting tools. Definition of data collected from sentinel and non-sentinel sites will be the same. The same DHIS software will be used to enter data, process and generate reports. All health facilities and DHO will use each facility specific data for routine monitoring as well as planning and management of health services at local and district levels. However, national level analysis will be done for the whole country as well as sentinel sites only to compare and contrast the figures. If wide variation is found between sentinel and non-sentinel data, the sentinel data will be used to come up with national estimates.

The following efforts will be made to optimise the quality of data collected from all health facilities in the entire country.

- At least quarterly verification of individual record and monthly data by DHMT for completeness and accuracy of data before entering into the computer at DHO.
- At least quarterly follow-up and practice based training of each person involved in data recording and aggregation and to ensure accuracy and completeness of data.

The above activities will be compulsory for sentinel facilities. Additional support will be provided to the sentinel facilities that are required for improvement of data quality.

6.6. Research
Operational research will be carried out to test the efficacy and effectiveness of the interventions of national interest. The area of essential health research will be elaborated in a separate document called “national health research policy” of Malawi. No research will be allowed involving the health system personnel that adversely affect the quantity and quality of service to be delivered. However, the research aimed at enhancing the knowledge, skills, morale and motivation of health personnel will be incorporated in the regular work-plans. HIMTC will define research priority for the country.
6.7. Integrated Disease Surveillance (IDS)
Communicable diseases continue to be a major cause of morbidity and mortality in Malawi. To curb it down, occurrence of notifiable disease will be timely analysed, investigated and feed to the management at facility, district and national levels for their appropriate response. Data collection on notifiable disease will be an integral part of disease surveillance carried out by HMIS system. The IDS will add investigation of disease and prompt reporting to the people responsible for response.

6.8. Pension Payroll and Personnel Information System (PPPIS)
This system has been instituted at central government level for managing the government payroll and pension system. This system provides necessary information required for broader human resource planning purpose. However, in the context of decentralised management of health services there is a need for a comprehensive human resource database maintained in each district health office for each facility within the district. Such database will include additional information required for human resource planning for the district.

6.9. Integrated Financial Management Information System (IFMIS)
The government has introduced IFMIS at central government level, which has been designed to track cash, inventories of drugs and stores, fixed assets, and reports to present unit costs. This is being done in line with the MTEF budgeting system that is already operational at all levels. The IFMIS feature data sets to measure progress towards equity and efficiency in the delivery of services.

6.10. Physical Assets Management Information System (PAMIS)
A record of health facilities and equipment (medical and non-medical) will be established for each health facility in the country. The record will contain current status, remaining life span and rehabilitation needs. Each DHO, central hospital, regional medical stores, CMS, CHSU and the Ministry headquarters will establish and maintain this record for its unit. The DHO will maintain electronic record by facility for entire districts and the Ministry will combine electronically established records from all DHO, CH, CMS, CHSU and headquarters and analyse current situation and plan for future. Such record will be routinely updated when there is change due to construction, supply and rehabilitation. A thorough comprehensive updating will take place once a year. Health facility survey carried out in 2002 will provide baseline data on the physical assets.

6.11. Logistics management information system (LMIS)
Currently the ministry, with the technical and financial assistance from aid partners, is undertaking an exercise to establish an integrated and comprehensive LMIS. This system will be able to provide necessary information on drugs, vaccine, contraceptives and other commodities supplies and their use.
7. Data collection, compilation, conversion and storage

Health data will be collected/compiled from both the primary and secondary sources. Data will be converted to information to knowledge and stored in appropriate form at all levels of health service management and delivery.

7.1. Data collection from primary source
Each health and support personnel record data while discharging its duty. The same person aggregates data in prescribed format.

7.2. Data compilation from secondary sources
Data required for planning and management of health services, but not collected directly from primary sources, are gathered from all available secondary sources.

7.3. Data conversion to information to knowledge
Raw data available from primary sources are converted to information to knowledge at the point of collection. Data from secondary sources are compiled by headquarters and reported down to district to facility for their use in planning and management of health services.

7.4. Data bank and safety measures
Health and management information will be safely kept at all levels: national, district and health facility. At national level, health information will be stored in book or electronic form as it is available. Automatic backup of electronic data will be done through mirroring all the content into another hard drive within the databank. After release of each quarter and annual report, data will be backed up in two CDs to keep in two different places. All hard copy will be available in the library. At facility and district levels, all registers and forms will be safely kept for 10 years.

7.4. Resource centres/Libraries
A resource centre will be established at each facility and DHO with minimum reference materials that are useful in managing different cases and programmes. Information on key indicators, showing trends and geographical comparisons, will be displayed on the wall in graphical forms. Data collected over last 5 years will be retained at this place. Requirement of reference materials (book, journal, magazine) at health centre, rural, district and central hospitals will be identified and provided. The library located at the Ministry headquarters will be part of national health information data bank.
8. Information flow

Local health staff recognizes disease outbreaks, low coverage of health services, and adverse environmental conditions. The main response takes place at the facility level followed by district level. The transmission of information is designed to elicit help from higher levels, and not merely to find a place in an archive.

A facility generates quarterly reports on each predefined indicator for use by the concerned programmes and other stakeholders. Each facility compiles data from its entire catchment area and organises review meeting with all stakeholders. The DHO compiles data from all facilities and performs comparative analysis and sends feedback to each health facility. The Ministry headquarters compiles data from all districts and central hospitals, perform necessary analysis and provides feedback to all reporters.

HIMS in headquarters sends reports to programme managers and provides general feedback to the DHOs and central hospitals.

Programme managers respond to the district and CH based on the report received. In this way, technical feedback by higher levels becomes as important as the bottom-up reporting. The above diagram shows how information is communicated between the levels.

Besides the bottom-up reporting and top down feedback mechanism as described above, HIMS in headquarters compiles data on core indicators from all reliable secondary sources and sends to districts and central hospitals for their use in planning and management of health services.
GIS is a powerful visual tool available for planning and monitoring of health services. It is more useful in tracking and monitoring health in terms of geographical variations in types and magnitude of problems and equity in distribution of health services across the country and their utilisation.

Most baseline data on spatial dimension of health are currently available. Digitisation of catchment boundary of each public health facility in the entire country is underway. Once completed, different thematic maps will be used in presentation of information on:

- Health facilities and catchment area
- Key services including VCT, ARV, CS
- Distribution of eradicable disease
- Endemic areas
- Key service coverage indicators by health facility catchment area at the district level and by health district at the national level

GIS information will be updated at district level. Spatial data will be updated annually and attribute data will be updated quarterly at other times as and when available. The GIS will be available in the intranet and website.

A GPS has been purchased for each DHO for collection of geo-referenced data on new health facilities and disease outbreaks. The location of a public health facility will be updated at the time of establishment and geo-address of epidemic and endemic data will be updated at the time of investigation and confirmation of cases.

A plotter has already been purchased in the MOHP headquarters for printing of health facility catchment area and health district maps on key themes. Deriving information from IHS, DHS, census and health services and disease surveillance statistics, maps will be printed on a few key thematic areas showing catchment and health district boundaries. Maps will be made available to each public health facility, district assembly and different departments of MOHP headquarters. Interested DP will also be served with thematic maps on request.

The printing of maps will be strictly controlled by a senior person responsible for dissemination of health information in the MOHP headquarters in order to avoid misuse of consumables.

---

2 GIS is built around two data types:

- Spatial objects – essentially maps: a catchment area, health facility, road,
- Attribute data – the data about the spatial object:
9. Dissemination

Health information will be disseminated to the intended users in predefined format as described below:

9.1. District health office
Each district health office will produce quarterly monitoring report and annual performance report in the given format and feed the information back to health facilities and all other stakeholders who are partners in health service management in the district.

9.1.1. Quarterly report
The quarterly report will contain information by facility on all relevant indicators of district health services.

9.1.2. Annual Report on District Health Services
Each district will conduct annual review meeting with all facility in-charges and other stakeholder and produce a report as titled above with the following contents.

- District at a glance: Maps, facts and figures.
- The current health status in the district: analysis of routine indicators.
- Organisation of health services: types of services, delivery points, and frequencies.
- Quality assurance, monitoring and supervision

9.2. Central hospital
Each central hospital produces quarterly monitoring reports on tertiary care indicators. Annually, performances are analysed and comprehensive report is produced covering the area of services delivery, human resources, financial management, physical assets, drugs and supplies, etc.

9.3. National level
At the national level, information is disseminated in different ways.

9.3.1. Quarterly Report
In each quarter, the Ministry compiles data from all districts and central hospitals and produce quarterly monitoring aggregated and comparative report for use of different national programmes and other stakeholders. A copy of this report is sent back to district health offices and central hospitals for their self-assessment, comparative analysis and actions.

9.3.2. Government Wide Area Network (GWAN)
All the publicly available information in the health sector will be made available at HMIS server which will be accessible to all GWAN members through intranet. The interested GWAN members will be able to download the disseminated data file into their computer and manipulate to meet its requirements.
9.3.3. Website
All formally published information will be disseminated at HMIS website for use of broad group of consumers including students, researchers, consultants, advisors and other interested people. All non-restricted data will be disseminated through website. Data collected through routine sources will be interactive in nature. Users will be able to define its requirements and generate report for any interval, any level and any data element or indicator. Data collected through non-routine sources and secondary sources will be disseminated at website as a document in appropriate format.

9.3.4. Publication of Health Statistical Report “Health of the Nation”
In October 1999, a Baseline Report to monitor the National Health Plan 1999-2004 was prepared, based on the available data at that time. The MOHP, utilizing the data from all predefined sources of information as described in this document, will publish, starting from 2003/2004, an annually updated statistical report “Health of the Nation” for monitoring the national health targets and for policy and operational planning. The report will contain at least the following chapters and will maintain the same format over years.

- Demography (estimated population for each target group by district) - Census
- Socio-economic status – DHS
- National Health Indicators – DHS / HMIS
- Health Programmes (objective, target, strategy, main activities, and current status)
- Human resource (establishment and positions filled by district and by type of facilities and future plan)
- Resource allocation (Total and programme specific budget distribution by district in actual amount and percentage of population)
- Annotated bibliography of reference documents

9.3.5. Report on request
Specific report, on the information not covered in other publications, will also be generated on request. The content of such report could be ranging from specific information about a particular facility for a specific point in time to trend of a service coverage or disease pattern over the period starting from January 2002. The cost involved in preparing and printing report will be charged to the concerned party.

---

10. Computerisation

Each health personnel involved in managing and delivery of health services will collect, aggregate and analyze information using paper pencil and a simple calculator and make immediate use in their daily work. This concept will remain as a basic fundamental principle of design of routine information system in the country for many years to come. But when information has to be aggregated for several health facilities and performed comparative analyses and generate various reports it will not only be very cumbersome to do it all manually but also a very ineffective and inefficient way of doing things. Therefore, maintaining the fundamental principle in place, the information processing will be computerized with care in the following 4 phases:

10.1. Data processing at DHO and CH levels
District health offices have already established computerised system to process data of each catchment facility including the district hospital. It includes data on national indicator on district health services, diseases, services and human resources. Similarly, central hospitals use computer in processing data on 25 national indicators on tertiary care services, OPD and inpatient disease surveillance and human resources. The Physical assets, human resources and financial information will also be fully computerised at DHO and CH levels by December 2003. TB patient will be registered in each district in electronic register in order to enhance the analyses of TB data.

10.2. Electronic Patient Register in CH
Individual inpatient record will be computerised in central hospitals. Each inpatient department will keep a separate computer for entering each case containing the data on age, sex, address, specific diagnosis, treatment, results, duration of stay in hospitals etc. The EPI info software, developed by CDC Atlanta in collaboration with WHO, will be used for this purpose. This system will be fully functional in 3 central hospitals by June 2004.

10.3. Touch screen Patient Management Information System
Paper based system has been replaced by a touch screen computerised system in the paediatric department of Lilongwe central hospital on a trial basis in collaboration with Baobab partnership. The main purpose of this system is to provide online information for management of care to an individual patient. This system is expected to contribute to the improvement in quality of care. The system will be expanded to all departments in Lilongwe central hospital by December 2004. The system will be evaluated and expanded to other central hospitals if so recommended by the evaluation.

10.4. Electronic Patient Register in larger hospitals
The activities implemented in central hospitals under phase II will be expanded to larger district and other hospitals in a phased manner. The main purpose of the system is to improve management efficiency by making it easier to monitor the utilisation of human resources and materials. Information will be readily accessible on the number of cases admitted, bed occupancy, duration of stay, types of cases staying for
relatively longer periods, geographical coverage for each type of service, cost sharing, availability of drugs and essential medical supplies and major investigations.
11. Strategies for the improvement of data quality and use

Each piece of information will be collected for predefined known use only. Without clearly defined use, no other reason will justify an investment in collection of information. Information is intended to use generally in policy formulation, programme planning (need identification, prioritisation, resource allocation), monitoring and evaluation. Both the HIPC and HIMTC will have the responsibility of setting standard, controlling quality and overseeing the use of information. Periodic assessment will be carried out to measure the extent of information use and to devise measures for improvement. The main strategy regarding improvement of data quality and use will be as follows:

11.1. Integrated supervision
Integrated supervision will be the main strategy for the improvement of quality of data and use. Comprehensive supervision sessions will be conducted, once in three months, at each district by zonal supervision team and at each health facility by DHMT. Supervision will be carried out using an integrated checklist to ensure adequate coverage of all aspects. Supervision schedule and agenda must be prepared, at least three months in advance, jointly by supervisor and supervisee to ensure adequate supervision at appropriate but mutually convenient time. Most shortcomings will be resolved right there at the site. Duly filled checklist will be submitted to the responsible higher authority for needful actions. The supervision will also serve the purpose of information audit.

11.2. Involvement of civil society
Civil society will be involved at all levels in monitoring the coverage of health services and health status. VHC, HC committee, district assembly, and parliamentary committee on health will be served with quarterly and annual reports generated at respective levels.

11.3. Performance criteria for budget allocation
Budget is allocated using certain formulae. Size of the population to be served and magnitude of health problems to be resolved will certainly be major criteria for allocation of resources. As money is spent to produce result, performance will be used as a criterion for annual budget allocation to district and central hospital. A composite indicator will be constructed from the core list of routine indicators, changing the composition every year to ensure rational use of resources.

11.4. HMIS in regular training curriculum
HMIS course conducted by the College of Medicine is credited towards MPH in Malawi, Tanzania, South Africa and Mozambique. Necessary support was provided to nursing and medical council as well as training institutions to include HMIS in all training curriculum. Follow-up will be made to ensure the allocation of adequate credit hours to information, monitoring and evaluation component.
11.5. M & E in job description
The job description of health and support personnel has been revised in the light of management of health information and use in planning and management of health services. Follow-up should be made, during integrated supervision sessions, to ensure proper understanding and use of job description.

11.6. Career path for health statistics profession
Health statistics is different from all other statistics. It cannot be interpreted without proper understanding of epidemiology. Attempt made to recruit health statistician from health background turned futile. People recruited from statistical background are now being trained on health matters. Their training on health will not be much useful in other sectors whereas health sector will need only people having such training. The statistical position created for DHOs and central hospitals is currently at EO level which is very low position compared to the responsibility assigned to them. These positions need to be upgraded and a clear career path has to be worked out within the health sector.

11.7. Reward for best practice
Every year, an event will be organised so that health and support personnel are encourage to think about the quality of data they collect and rationality of decisions they make. In 2003, an essay competition is being organised to improve the quality of data and use. Besides continuation of annual essay competition on best practices, other innovative approaches will be devised.

11.8. Practice based teaching
Experience has shown that a theoretical teaching has very limited impact on information management and use. Therefore, besides the integrated supervision sessions, special sessions will be organised at district and facility levels for practice based training where people will go through the process of recording, analysing and use of information in real world.

11.9. Disbursement by result
In order to make health facilities, district health offices and district assembly accountable for achieving the targets and milestones set for different programme activities, disbursement of funds and supplies to these levels will be linked with results. The reporting of results will be started with simply timely reporting to strictly achievement of milestones in incremental manner (in the first year just timely submission of reports, in the second year correctness and completeness of timely submitted report and in the third year achievement of target and milestones in each report etc.).
12. Monitoring Framework

The success of sector wide approach, decentralization, hospital autonomy and many other health sector reform initiatives depends on effectiveness of monitoring and evaluation system. Monitoring is the single most management function to be carried out by each health and support personnel at each health management and service delivery level. A simple system has been agreed for routine monitoring and joint annual review in order to take on board all the stakeholders in this process.

12.1. Results and Dimensions

The monitoring model will follow a clear logical pathway of results in which results at one level are expected to lead to results at next level leading to the achievement of overall goal.

**Inputs ➔ Outputs ➔ Outcomes ➔ Impacts**

Results will be measured on all six dimensions of performance namely access, equity, quality, effectiveness, efficiency and sustainability. Satisfactory performance on all dimensions will reflect on attainment of health by all Malawians.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>✓</td>
</tr>
<tr>
<td>Equity</td>
<td>✓</td>
</tr>
<tr>
<td>Quality</td>
<td>✓</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>✓</td>
</tr>
<tr>
<td>Efficiency</td>
<td>✓</td>
</tr>
<tr>
<td>Sustainability</td>
<td>✓</td>
</tr>
</tbody>
</table>

Towards attainment of health by all Malawians.

12.2. Conceptual Framework for Monitoring and Annual Review

The health sector monitoring will be participatory and pragmatic. Data required for routine monitoring is recorded and collated by the same person who is responsible for service/job/task. Routine data collected, in this way, by each health and support personnel is gathered in one place called data bank or data warehouse. The data bank acquires required supplementary information from all other relevant sources. The bank compiles data into comprehensive report and sends to all person responsible for programme management as well as a copy to next higher level. This philosophy is
illustrated in the diagram. Respective managers send feedback to their lower cadre. The essence of the above diagram is that a data gets complete picture in form of information only after passing through data bank where piece and pieces of data gathered from different source amalgamated into a comprehensive report.

Routine monitoring and preparation for annual joint review will be one of the core functions of each programme manager and director at local and national levels. Respective in-charges and heads of the departments will be ultimately responsible for monitoring and evaluation functions related to their department. Specific programme manager and director will be responsible for ensuring the collection of complete and accurate data for all services and activities related to its department. Nevertheless, data processing, storage, dissemination will be done only through a single channel. The diagram below presents how data will be compiled and feed to respective departments and stakeholders at headquarters level for the purpose of routine monitoring periodic review by respective departments/stakeholders.

The HIMTC assesses specific information needs and designs information collection tools. Each health and support personnel collects and compiles data on all data elements that are related to its job. In-charge and programme specific immediate supervisor, if any, ensures the accuracy and completeness of data. In-charge, with a help of assigned person, prepares single report and communicates to all stakeholders. Thus, data collection and monitoring has become a responsibility of each person.
12.3. Routine Monitoring
Routine monitoring is the single most responsibility of the head of each office. The table below presents how routine-monitoring functions will be carried out in the health sector.

<table>
<thead>
<tr>
<th>Level</th>
<th>Responsible person/office</th>
<th>Frequency of routine monitoring</th>
<th>Tools and methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>National level</td>
<td>Respective director for its department</td>
<td>Quarterly</td>
<td>Quarterly HMIS report</td>
</tr>
<tr>
<td>Sub-national/Zonal level</td>
<td>Zonal supervisor</td>
<td>Quarterly</td>
<td>* Supervision checklist, * Quarterly HMIS report</td>
</tr>
<tr>
<td>District</td>
<td>• District Assembly</td>
<td>Quarterly</td>
<td>* Supervision checklist, * Quarterly HMIS report</td>
</tr>
<tr>
<td></td>
<td>• DHMT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facility catchment area</td>
<td>• Health Facility Committee</td>
<td>Monthly</td>
<td>Monthly data aggregation and monitoring tool</td>
</tr>
<tr>
<td></td>
<td>• Health Management Team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>VHC <em>(with the help of community health workers)</em></td>
<td>Monthly</td>
<td>Community health diary</td>
</tr>
</tbody>
</table>

The annual programme of work (POW) and annual district implementation plan (DIP) will be used for routine monitoring of activities and targets. Financial, human resources and material inputs, service coverage, morbidity, mortality and health facility utilization pattern will be routinely tracked through routine HMIS.

12.4. Monitoring Tools and Methods
An effective monitoring is critical to the achievement of health targets expressed in terms of mission, goals, objectives, impacts, outcomes, outputs, process and inputs. The scope of monitoring at each level, tools and procedures they use are briefly elaborated in the following paragraphs of this section.

12.4.1. Individual family
Three client health booklets (child health profile, woman health profile and general health profile) are introduced in all public and private health facilities to improve the quality of health care. All booklets contain records of updated client history, assessment of current problems and types of care given. The child health booklet is issued at birth. It contains specific information on immunisation, vitamin A and growth monitoring. A male child can use the same booklet for his entire life, as long as there is space to record the assessment and care provided. For men, the general health booklet can be annexed to their child health profile for continuous recording the diagnosis and care provided. The girl child, however, will use a woman health booklet when she reaches puberty. The woman health booklet contains specific information on tetanus toxoid injection, family planning services, antenatal check-ups, obstetric history and postnatal services as well as her general history. These booklets are sold at a price to ensure re-supply of booklets. Surprisingly, these booklets are in great demand. It has been observed that the use of the client health booklets has tremendous positive impact on the quality of individual client care.

12.4.2. Community level
Community Health Workers especially Health Surveillance Assistants (HSA) use the Community Health Diary to:
i) record community health activities and vital events,
ii) track trends over period, and,
iii) facilitate the community based organizations in planning and implementing community health activities.

For this purpose, a Community Health Worker (CHW) collects data from the following sources:

- Direct observation of community health activities;
- Interview with key informants in the community;
- Minutes of Village Health Committee meetings;
- Vital Register;
- TBA Card;
- CBDA Card;
- HMIS Registers used at facility and outreach clinics.

12.4.3. Health Facility Catchment Area

The service providers at health facility compile data on various elements on daily basis. The daily figures are compared with previous day figure and plan for next day accordingly. Such daily compiled figures are added to monthly figure, analysed, discussed and decisions are taken for improvement and implemented. A set of tools (Wall Charts) is used for data aggregation and monitoring at facility level.

All partners including private providers are involved in provision of services in the communities. All partners collectively plan and assess achievements. The medical and nursing councils will enforce regulation for private practitioners to comply with reporting requirements.

12.4.4. Health district

District health office receives quarterly report from each health facility and supplement information from the district health office itself. Comparative analyses are performed, performance of each facility tracked and issues to be addressed are identified. Necessary feedback and management support are provided. Computer and software designed for this purpose is used in data processing for this process.

12.4.5. National Level

The ministry receives electronic data from district and central hospitals and provides information with comparative analysis by district and central hospital using a number of reporting templates that are in HMIS software.

12.5. Evaluation / Annual performance review

Overall performance of the fiscal year is reviewed each year at facility, district and national levels. All stakeholders will take part in the review. Such review furnish data as baseline for the following year’s annual planning. DHO, central hospital and headquarters will publish annual review report using the template described in the next section.

12.5.1. Annual Joint Review
All the stakeholders who have contributed to the development of health of Malawians have interest, obligation and right to know the results that have been produced through each of their specific and collective inputs. On the other hand, it is a heavy burden to health system to carry out specific review for each DP with specific requirements. As all DPs and government of Malawi is working to uplift the health of the people of Malawi, the progress made through any input will be measured against the same objective using the same measurement unit, tools and methods.

12.5.2. Annual Joint Review Committee

All the stakeholders who have made financial and technical contribution will sit together and carry out annual joint review. The review will be lead by MOHP. A permanent committee, consisting of the following members, will be responsible for the preparation and review.

i. PS, MOHP – chair
ii. Directors of all departments, CHSU, CMS – members
iii. Donor organizations – members
iv. Representative of University of Malawi, National Statistic Office, Economic and Planning Department, MOF, MOLG, Department of Human Resource, National AIDS Commission- members
v. Executive Secretary of CHAM secretariat – member/co-chair
vi. Director of Planning - member secretary

12.5.3. Annual Joint Review Process

Each member of annual joint review committee will prepare detailed report on inputs, processes and outputs of its organization/department covering the period of completed financial year and the first six-month of current financial year. Report will cover all indicators disaggregated by district, as appropriate. DOP will receive such report from all members by March 15, compile into a single health sector annual report and send to all stakeholders by April 15. During the first week of May each year, annual joint review meeting will be convened where performance of each indicator will be evaluated, issues will be discussed and priorities for the subsequent year will be agreed upon.

12.5.4. Content of Annual Joint Review

The Ministry of Health and Population, in consultation with all development partners, has endorsed a total of 110 indicators as standard measures for monitoring and evaluation of health sector performance. A total of 26 indicators have been selected for annual joint review. As the health sector fulfills minimum requirements, the annual joint review committee will drop the basic indicators and add higher-level indicators to reflect on concurrent issues of developments.
Annex 1: Objectively verifiable Indicators (OVI) for Measuring success of information system

Success of the system is highly dependent on a clear vision of direction and well-supported strategic plans.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>OVI</th>
<th>Means of verification</th>
</tr>
</thead>
</table>
| Required health and management information are available to all users in the health sector to meet each of their predefined needs | • Quarterly report on routine data published at facility, district and national levels.  
• Routine data disseminated at all facilities and DHO using appropriate graphs and chart as described in HMIS training manual.  
• Annual performance report produced by each district and central hospital.  
• Health of the nation published every year  
• All pertinent health information documents are disseminated at GWAN.  
• All formal publication of health documents are disseminated at “health information website”. | • Quarterly report from facilities  
• Quarterly report from district health offices  
• Quarterly report from the Ministry headquarters  
• Annual report from DHO and CH  
• Annual publication of “health of the nation”  
• Government WAN  
• Health information website |
| Required information is accessible to all concerned users. | • All reports are officially distributed to all primary users within a month of publication  
• No password restriction authorised users to access shared component of HMIS server  
• No password restriction to the authorised users at health information website | • Copies printed  
• Distribution list  
• Delivery notes  
• Direct accessibility verification of website and the HMIS server |
| The intended primary users of the information are informed about the information | • Information dissemination meeting organised on regular basis  
• Copy of appropriate reports and other appropriate publications are available in the libraries of all stakeholders including training institutions and universities. | • Dissemination meeting reports  
• Distribution list  
• Delivery notes |
<table>
<thead>
<tr>
<th></th>
<th>Evidence of:</th>
<th>Feedback reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information correctly</td>
<td>• data analyses</td>
<td>• Plan documents</td>
</tr>
<tr>
<td>interpreted and used</td>
<td>• interpretation and</td>
<td>• Supervision reports</td>
</tr>
<tr>
<td></td>
<td>• response to information</td>
<td>• Letters</td>
</tr>
<tr>
<td></td>
<td>• use of information in planning and management of health services</td>
<td>• Investigation reports</td>
</tr>
<tr>
<td>Information complete</td>
<td>• Percentage of reports completely filled</td>
<td></td>
</tr>
<tr>
<td>and timely</td>
<td>• Percentage of reports received within specified time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All agreed data elements are covered in relevant information collection tools</td>
<td></td>
</tr>
<tr>
<td>Data collection tools</td>
<td>Health personnel trained in management of information and M &amp; E</td>
<td>Training reports</td>
</tr>
<tr>
<td>are up to date and</td>
<td></td>
<td>Training curriculum of different health training</td>
</tr>
<tr>
<td>available</td>
<td></td>
<td>programme</td>
</tr>
<tr>
<td>Appropriate training</td>
<td>Inclusion of management of health information and M &amp; E functions in all job</td>
<td>Approved job descriptions of all health and support</td>
</tr>
<tr>
<td>to different health</td>
<td>description in relation to information and use</td>
<td>personnel working in the health sector</td>
</tr>
<tr>
<td>personnel</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Updated job description in relation to information generation and use
Annex 2: Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>The proportion of a defined population that has a particular facility within reasonable reach, which may be measured by distance, time, costs or social or cultural factors.</td>
</tr>
<tr>
<td>Accuracy</td>
<td>The degree to which a measured value represents the true value of the variable that is being measured.</td>
</tr>
<tr>
<td>Admission</td>
<td>A formal acceptance of a patient by a hospital to receive care while occupying a health facility bed.</td>
</tr>
<tr>
<td>Aggregate data</td>
<td>Sum total of data elements; gathering individual elements into groupings, data elements assembled into a logical format to facilitate comparison or to elicit evidence of patterns.</td>
</tr>
<tr>
<td>Baseline survey</td>
<td>A survey that is conducted early in the life of a programme to establish data against which future result will be compared.</td>
</tr>
<tr>
<td>Bed capacity</td>
<td>The number of beds regularly maintained for inpatient in a hospital.</td>
</tr>
<tr>
<td>Catchment area</td>
<td>The geographical area from the people attending a particular health facility.</td>
</tr>
<tr>
<td>Census</td>
<td>Count of items.</td>
</tr>
<tr>
<td>Coverage</td>
<td>People who have actually received a particular service compared to all those who need it.</td>
</tr>
<tr>
<td>Cumulative</td>
<td>Increasing in size by repeated addition.</td>
</tr>
<tr>
<td>Data analysis</td>
<td>The process of examining data and findings patterns or trends. This provides managers with new information about their programmes and services and helps them to make better management of decisions.</td>
</tr>
<tr>
<td>Data elements</td>
<td>item of information like age, sex etc.</td>
</tr>
<tr>
<td>Data integrity</td>
<td>Accuracy and completeness of data.</td>
</tr>
<tr>
<td>Data item</td>
<td>Smallest unit of data stored in a computer system.</td>
</tr>
<tr>
<td>Data redundancy</td>
<td>Data entered more than once within the same facility.</td>
</tr>
<tr>
<td>Data set</td>
<td>A group of data elements relevant for a particular use. The data elements are defined to promote uniform collection of data.</td>
</tr>
<tr>
<td>Database</td>
<td>A database is a collection of related information used for archiving data. A database can be found both text and numerical formats.</td>
</tr>
<tr>
<td>Disease surveillance</td>
<td>The continuing scrutiny of all aspects of occurrence and spread of diseases to detect changes in trends or distribution, as a basis for instigating control measures.</td>
</tr>
</tbody>
</table>
Effectiveness: The extent to which a programme has made desired changes through the delivery of services.

Efficiency: The extent to which a programme used resources appropriately and completed activities in a timely manner.

Endemic: The constant presence of a disease or infectious agent in a given population or geographical area.

Epidemic: The occurrence of an illness in a community clearly in excess of what is normally expected.

Epidemiology: The study of the distribution and determinants of health related states and events in population, and the application of this study to control health problems.

Episode: A single occurrence of a health problem. A child may have several separate episodes of diarrhoea in one year.

Evaluation: A process that attempts to determine as systematically and objectively as possible the relevance, effectiveness, and impact of activities in the light of their objectives. Several varieties of evaluation can be distinguished, e.g., evaluation of structure, process, and outcome.

Exit interview: An interview conducted with users of a service as they leave the facility to assess how they feel about the services they received.

Feedback: The process by which information is passed back to the people providing the data. The process allows for two-way communication.

Focus group discussion: A planned and guided discussion among the participants of a selected group for the purpose of examining particular issue.

Gantt chart: The summary of a work plan presented in the chart showing the major activities planned in chronological sequence including date, responsible person and resources.

GIS: Geographical information system (GIS) is an organised collection of computer hardware, software, geographic data and personnel designed to efficiently capture, store, update, manipulate, analysed and display all forms of geographically referenced information. (Also see GPS, Thematic map, Victor graphics)

GPS: Geographical positioning system. It is a machine that detects the geographical position of a location. (Also see GIS)

Hard copy: A printed copy.

Hardware: The physical parts of a computer.
Health area: The geographic area assigned to a supervisor by the government. A health area may include a health facility, community health workers or both.

Health facility deaths: Deaths occurring after lodging a patient in an inpatient bed.

Health Information Management: Information management is the planning and control of the processes of identifying information needs and establishing information systems (whether automated or manual). These processes include the identification, collection, organization, storage, protection, access, dissemination, analysis, and interpretation of all corporate information, regardless of medium and format. This is known as the “life cycle” approach to information management and centers on the treatment of information as a valuable resource or asset crucial to the proper operation of an organization.

Health Information System: An information system related to health. When used in this report, references to health information systems include the broad areas of health care, public health information, health statistics, and public health surveillance systems.

Health policy: A set of statements and decisions defining health priorities and main directions for attaining health goals.

Health situation: The health status of a population determined by an analysis of demographic statistics, knowledge, attitudes and practices of the population.

Health Statistics: Aggregated data describing and enumerating attributes, events, behaviours, services, resources, outcomes, or cost related to health, disease, and health services. The data may be derived from survey instruments, medical records, and administrative documents. Vital statistics are a subset of health statistics.

Households: A group of persons living together in a house and sharing common food arrangements.

Impact: The extent to which the programme has changed or improved the knowledge, attitudes, behaviour or health of the programme participants.

Incidence: occurrence of new cases of a specific disease in a specified community during a specified period of time.

Infant mortality: Death under one year of age.

Information System: The organized collection, processing, transmission, and dissemination of information in accordance with defined procedures, whether automated or manual.
Information Technology: The computer hardware, software, and telecommunications operated by an organization to accomplish a function.

Inputs: Resources used in a programme.

Integrated Information System: The coordination, blending, or uniting of data and information into a unified whole. Integration does not require a singular system, but it does require compatibility and/or interoperability of systems through data and communication standards.

Interface: The point at which one system’s functioning ends and another system takes over; a shared boundary between two systems.

Length of stay: Number of days an inpatient has stayed in the health facility. It is computed by subtracting the admission date from discharge date. Admission and discharge on the same day is counted as one day.

Management information system: A system designed by an organisation to collect and report information on a programme and which allows managers to plan, monitor and evaluate the operations and the performance of the programme.

Management: Process of coordinating individual and group activity toward the accomplishment of organisational goals in a manner that is acceptable to the larger society.

Mapping: A process by which information or data are laid out on a diagram for the purpose of tracking changes in the data.

Maternal mortality: Female death due to complication of pregnancy, childbirth and the puerperium (six weeks after delivery).

Medical record: A cumulative narrative of the history of a patient, final diagnosis, treatment given and follow up after admission.

Monitoring: The performance and analysis of routine measurements, aimed at detecting changes in the environment or health status of populations. Not to be confused with "surveillance". To some, monitoring also implies intervention in the light of observed measurements. Ongoing measurement of performance of a health service or health professional, or of the extent to which patient comply with or adhere to advice from health professionals. In management, the continuous oversight of the implementation of an activity that seeks to ensure that input deliveries, work schedules, targeted outputs, and the other required actions are preceding according to plan.

Morbidity: Extent of illness, injury, or disability in a given population.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>Death rate in a given population.</td>
</tr>
<tr>
<td>Motivation</td>
<td>A feeling wanting to do something. Lack of motivation is a feeling of not caring or having no interest in doing something.</td>
</tr>
<tr>
<td>Neo-natal death</td>
<td>Death of infant under 28 days of age.</td>
</tr>
<tr>
<td>New episode</td>
<td>An occurrence of a health problem that happens after any previous occurrence has stopped.</td>
</tr>
<tr>
<td>Notifiable disease</td>
<td>A disease that must be immediately reported to the public health authority.</td>
</tr>
<tr>
<td>Outpatient</td>
<td>A patient whose visits to a health care facility is confined to only a few hours and who is not admitted in the inpatient bed.</td>
</tr>
<tr>
<td>Patient</td>
<td>Person, including one who deceased, who is receiving and or using or has received health care services.</td>
</tr>
<tr>
<td>Peri-natal death</td>
<td>Death of infant in the first week after birth.</td>
</tr>
<tr>
<td>Population based survey</td>
<td>A survey in which information is obtained directly from a representative sample of the population of interest.</td>
</tr>
<tr>
<td>Population growth</td>
<td>change in population size as a result of births, deaths, and net migration.</td>
</tr>
<tr>
<td>Post-neonatal death</td>
<td>Death of infant aged between 28 and 364 days.</td>
</tr>
<tr>
<td>Postpartum</td>
<td>After childbirth; the first six weeks after childbirth.</td>
</tr>
<tr>
<td>Prevalence</td>
<td>A measure of the total number of existing cases of a disease or condition at a specific point in time is called point prevalence. If a period of time is specified, then the resulting disease measure is period prevalence.</td>
</tr>
<tr>
<td>Prevention</td>
<td>Measures aimed at promoting and maintaining health by improving nutritional status, immunisation, suitable water supplies, excreta disposal, early detection of cases and treatment.</td>
</tr>
<tr>
<td>Primary care</td>
<td>Care provided at first contact.</td>
</tr>
<tr>
<td>Providers</td>
<td>Individuals or organisations that provide health care services to individual patient or community.</td>
</tr>
<tr>
<td>Proxy indicator</td>
<td>An indicator used in place of a direct indicator that may be more difficult to measure or compute.</td>
</tr>
<tr>
<td>Qualitative analysis</td>
<td>Review of records for accuracy and completeness of the record content rather than for the presence of forms and signatures.</td>
</tr>
<tr>
<td>Qualitative data</td>
<td>Observations or information characterized by measurement on a categorical scale i.e., a dichotomous or nominal scale,</td>
</tr>
</tbody>
</table>
or, if the categories are ordered, an ordinal scale. Examples are sex, hair, colour, death, or survival, and nationality.

Quantitative data: Data in numerical quantities such as continuous measurements or counts.

Rapid Assessment: A mini survey that uses a small reliable sample, short in duration to examine small set of variables.

Rate: A measure of an event (numerator) within a specified population (denominator) at a specific point in time. A/b in which the “a” is part of “b”. Expressed in 100, 1000, 10,000 or 100,000 depending on the magnitude of numerator.

Ratio: A proportion obtained by dividing one quantity by another quantity. A/b in which the “a” is not part of “b”. Expressed in 100, 1000, 10,000 or 100,000 depending on the magnitude of numerator.

Record: Group of data items that are stored together and or used together in processing.

Reliability of data: Data that yield the same results on repeated collection, processing, storage, and display of information in the same database; data that are consistent when entered into two or more database.

Reliability: Produces the same result if measure by different people under the similar circumstances.

Reporting channels: An established system within a supervisory structure for reporting information and data. Appropriate reporting channels are critical as the services are integrated and management is decentralised.

Revisits: A visit made by a person to a clinic for follow up or re-supply.

Server: A computer or programme that provides services or information to another computer.

Situation Analysis: Study of a situation that may require improvement. This begins with a definition of the problem, and an assessment or measurement of its extent, severity, causes, and impact upon the community, and is followed by appraisal of interactions between the system and its environment and evaluation of performance.

Software: The programmes which enable a computer to perform diverse functions and which are stored electronically in it.

Spot map: A map showing the geographical distribution of people with a particular characteristic.
Target group: The specific population groups intended as beneficiaries of a programme.

Target: A goal to work towards, express as a number or rate.

Tertiary care: Generic term for highly specialised care provided by the specialists who use sophisticated technology and support services.

Thematic map: It is a data visualisation technique where the attributes of geographic features are displayed graphically on a map. For example a map showing variation of immunization coverage by district. Thematic map can also be applied to point locations such as a map showing hospital locations where the size, colour and symbol indicates the type of hospital and number of beds. (Also see GIS)

Threshold: Tolerance limit in monitoring and evaluation; point at which a process is subjected to intensive review to determine the need for corrective action.

Timeliness of data: Length of time is minimised between an event or observation that produces data, the recording of the data, and when the data become available to those who need the data.

Trend analysis: The representation of data to show an increasing, decreasing or unchanging

Validity of data: Numbers, characters, or symbols stored, processed, and displayed are exact and conform to known standards. Data represent what was intended by the original sources.

Validity: Correctness, completeness, accuracy, and relevance; measures how well an instrument measures what it should measure; characteristics of information. Valid information is meaningful and relevant to stated purpose. Information may be invalid if applied to a different purpose than that for which it was collected.

Vital registration: the formal recording of events of human life such as birth, marriage, migration, deaths etc.