Republic of Malawi

Health Metrics Network

Health Information Systems Assessment Report 2009

Ministry of Health
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Chris Kang'ombe

SECRETARY FOR HEALTH

Executive Summary

In May of 2009, the Ministry of Health, in conjunction with Health Metrics Network (HMN), conducted a Health Information Systems (HIS) Assessment using version 4.0 of the HMN Assessment Tool, a universally agreed standard for guiding the collection, reporting, and use of health information by countries.

The tool is divided into six components, including HIS resources, indicators, data sources, data management, information products, and dissemination and use.

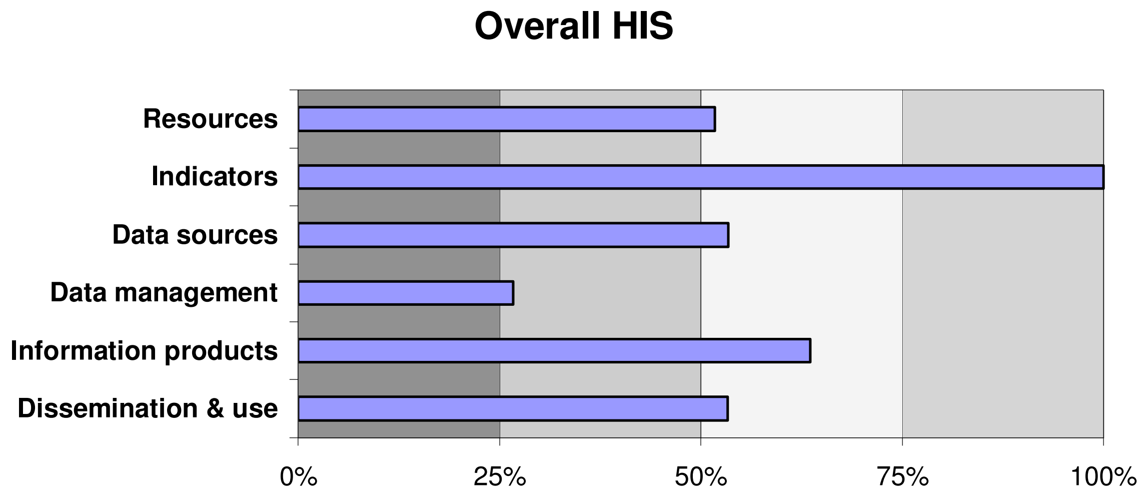
Overall HIS results indicate that resources are *adequate,* with HIS institutions, human resources and financing as areas needing more attention. Indicators appear to be *highly adequate,* although the measurement tool only took into consideration core indicator definitions, not necessarily the completeness of the data on the indicators themselves.

Overall data sources are *adequate,* with population-based surveys scoring 'highly adequate' but vital statistics 'not adequate at all'.

In regards to data management at the national level, results indicate that it is *present but not adequate*. This is primarily due to the fact that no national data warehouse exists; unique identifiers are not used; and no meta-data dictionary exists.

The overall quality of HIS information products was found to be *adequate,* granted risk factor indicators were *not adequate at all.*

Finally, overall dissemination and use was found to be *adequate,* yet information use for policy and advocacy as well as analysis and use of information are *present but not adequate.*



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List of Acronyms

AIDS	Acquired Immuno-Deficiency Syndrome
CBHIS	Community Based Health Information System
CDC	Centers for Disease Control and Prevention
CHAM	Christian Health Association of Malawi
CHW	Community Health Worker
CMED	Central Monitoring and Evaluation Division
DANIDA	Danish International Development Agency
DFID	Department for International Development
DFID	Department for International Development
DHIS	District Health Information System software
DHMT	District Health Management Team
DHMT	District Health Management Team
DHO	District Health Officer
DHS	Demographic and Health Surveys
DSS	Demographic Surveillance System
EDS	Electronic Data Systems
EHP	Essential Health Package
EP&D	Economic Planning and Development
GDP	Gross Domestic Product
GGHE	General Government Health Expenditure
HDI	Human Development Index
HIPC	Highly Indebted Poor Countries
HIS	Health Information System
HIS	Integrated Household Survey
HIV	Human Immune-deficiency Virus
HMIS	Health Management Information System
HMN	Health Metrics Network
HRD	Human Resources Development
HRH	Human Resources for Health
HSRG	Health Sector Review Group
HSSP	Health Sector Strategic Plan
ICT	Information and Communication Technology
IDSR	Integrated Disease Surveillance and Response
IFMIS	Integrated Financial Management Information System
ITN	Insecticide Treated Nets
LA	Local Assemblies
LMIS	Logistics Management Information System
LQAS	Lot Quality Assurance Sampling
MDGs	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MoH	Ministry of Health
MoU	Memorandum of Understanding
MTEF	Medium Term Expenditure Framework
NGO	Non Governmental Organization
NHA	National Health Accounts
NSO	National Statistical Office

PAMIS	Physical Asset Management Information System
PHC	Population and Housing Census
PMTCT	Prevention of Mother-To-Child Transmission
PPPMIS	Pension, Payroll and Personnel Information System
SMC	Senior management Committee
SWAp	Sector-Wide Approach
TA	Technical Assistance
TB	Tuberculosis
THE	Total Health Expenditure
TWG	Technical Working Group
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
WHO	World Health Organization
WMS	Welfare Monitoring Survey

Chapter 1: Background

1.1. Socio-economic and administrative context

Malawi is a landlocked country located in Southern Africa. It is bordered to the north and northeast by Tanzania, to the east, south and south west by Mozambique, and to the west by Zambia.

The country is 901 km long and ranges in width from 80 to 161 km. It has a total of 118, 484 square km of which 94,276 square km is land area. The remaining area is mostly composed of Lake Malawi, which is about 475 km long and runs down Malawi's eastern boundary with Mozambique. The country is divided into three administrative regions, namely Northern, Central, and Southern. There are 28 districts; six in the Northern Region, nine in the Central Region, and thirteen in the Southern Region. These districts vary in population, geographical and socioeconomic factors. According to the 2008 Population and Housing Census, the total population is estimated at 13,066,320.

Malawi is a low-income country with an estimated gross domestic product (GDP) per capita of 667 (PPP[1] US$) in 2005 (World Bank 2008). In 2005, official development assistance constituted about 27.8% of the GDP (UNDP 2007). The country reached the completion point under the Enhanced Heavily Indebted Poor Countries (HIPC) Initiative and got approval of debt relief under the Multilateral Debt Relief Initiative in 2006 (IMF 2006). About 52% of the population lives below a national poverty line of 16,165 Malawi Kwacha per person per annum – the equivalent of US$ 147(NSO 2005). The median per capita income of the richest income decile (i.e. the richest 10%) is about eight times that of the poorest decile. The gini coefficient for the period 2000-2005 was 0.39.

Like most countries in the Sub-Saharan region, Malawi is classified in the group of low human development countries with a human development index (HDI) of 0.437 in 2005 (UNDP 2007). The country's HDI rank during the same period was 164 out of 177 countries.

1.2. Health status and health system

Health Status

The epidemiological profile is characterized by a high prevalence of communicable diseases including malaria, tuberculosis and HIV/AIDS; high incidence of maternal and child health problems; an increasing burden of non-communicable diseases such as cancers, hypertension, diabetes, cardiovascular diseases and mental illnesses, among others. The country is also facing the resurgence of neglected tropical diseases. Although there has been a significant decline in infant mortality from 76/1000 live births in 2004 to 69/1000 live births in 2006 and under-five mortality from 133 in 2004 to 122 in 2006 (MICS, 2006), the rates are still high. The maternal mortality ratio of 807 per 100,000 live births is one of the highest in the world.

[1] Purchasing Power Parity

The proportion of deliveries attended by skilled health personnel is at 54 % (MICS, 2006). Proportion of pregnant women receiving antenatal care at any point during their pregnancy is at 91.8%, with an average number of visits of 3 (ibid), which is below recommended minimum of 4 checkups. Late and inadequate utilization of antenatal care and low proportion of deliveries by trained health personnel are some of the contributory factors to the high rate of maternal mortality.

According to MICS 2006 report, about 19% of children under the age of 5 years are underweight. The proportion of children aged between 12 – 23 months fully immunized is at 70.4%. Acute and diarrhoeal diseases are among major causes of under-five (U5) morbidity and mortality. Prevalence of fever among the under five is at 34.7%. Such high prevalence of fever among the U5 would partly be explained by the low proportion of under-five children sleeping under an insecticide treated nets (ITN), which is at 24.7%. (MICS, 2006)

The HIV and syphilis sero-survey of 2007 estimates national adult (15 – 49 years) HIV prevalence rate of 12 % (MOH, 2007). The number of HIV persons who are alive and on treatment (Highly Active Anti-retroviral therapy) has increased from 61,430 at mid 2006 to 158,137 by March, 2009 representing 64% of (216,245) those ever started treatment (MOH, 2009).

Although the prevalence rate for TB is not known because the prevalence survey is yet to be done, the 2007 TB Annual Report indicates the cure rate at 78%.

Despite the major gains in reducing childhood mortality, life expectancy has worsened in the other age groups, due in great part to the HIV and AIDS pandemic. Overall, life expectancy has declined from 44 years in 1990s to 38 years by 2004.

Health System

Malawi has a three-tier health care delivery system: primary, secondary and tertiary levels of care. Fifty percent of the health facilities are under the Ministry of Health whilst 16% are under the Christian Health Association of Malawi (CHAM) (HRH Census, 2008). Other private providers own 20%, while non-governmental organizations operate 7%. Statutory corporations and companies own 5% and 2% of the facilities respectively.

The integrated health delivery system at the district level is managed by the District Health Management Team (DHMT). The main function of the DHMT, which is headed by the DHO, is to coordinate the provision of promotive, preventive, curative and rehabilitative services and to ensure that sufficient resources are available, and that they are used effectively and efficiently. With the implementation of the decentralization policy of government the structure of the DHMT has changed. The devolution process has led to the integration of the District Health Management Team into the District Assembly structures whereby the DHOs now report directly to the District Commissioners.

The government's policy emphasizes provision of health services within the context of health reforms, including decentralization as a priority area of focus. The reforms are aimed at improving efficiency and enhancing community participation in decision makings and

implementation of health programmes. The devolution plan which guides the decentralization process is in line with the National Decentralization Policy. Under the devolved plan primary and secondary levels of care have been handed over to Local Assemblies (LAs). Districts develop their own health plans using community participatory structures. Funding for health services is channelled directly to the Local Assemblies by Treasury Department of the Ministry of Finance.

At the central level, the main role is that of stewardship, which includes, among other roles, provision of technical support to Local Assemblies in the efficient implementation of their health plans.

The health system faces a critical shortage of human resources for health. The current doctor/population and nurse/population ratios are 1:53,176 and 1:2,964, respectively; far below the WHO recommended standards for developing countries of 1 doctor per 5,000 population and 1 Nurse per1,000 population.

1.3. Health policies and strategies

The long term goal for the Health Sector is "To improve health status of people at all levels in a sustainable manner". The goal is underlined with the overall policy statement which is "to raise the level of health status of all Malawians by reducing the incidence of illness and occurrence of premature deaths in the population".

The MOH is implementing a health service delivery strategy based on the delivery of the Essential Health Package (EHP) in a context of the SWAp Joint Program of Work (2004 – 2010). The implementation framework of the POW and other programs in the sector is guided by other policies that include the Decentralization Policy, the Malawi Poverty Reduction Strategy, and the Vision 2020 among others. Monitoring and evaluation framework of the Health Sector is based on annual joint reviews involving all the stakeholders to the POW.

In 2004, the Government of Malawi adopted the SWAp as a mechanism of coordinating the activities of all stakeholders in the health sector. The health SWAp provides for the government and all development partners to pool their resources to support a common plan and expenditure framework that ultimately contributes to Malawi's Growth and Development Strategy (MGDS) and Millennium Development Goals (MDGs). The priorities revolve around the provision of the Essential Health Package (EHP), that is delivered free of charge at the point of delivery, and focuses on interventions against 11 major health problems. These include: vaccine preventable diseases; malaria; acute respiratory infections (ARI) including pneumonia; diarrheal diseases including cholera; sexual and reproductive health including family planning; HIV/AIDS and sexually transmitted infections; tuberculosis; schistosomiasis; nutritional deficiencies; common injuries; and ear, eye and skin infections. Currently, the EHP is undergoing review.

The routine HMIS has been developed in a well-structured systematic way, including selection of indicators, development of data sets, development of instruments and reference manuals, testing of tools and guidelines, nation-wide launching, constant supervision, follow-up and feedback. Therefore, the national HIS Policy and Strategy document provides 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.

1.4. Overview of Health Information Systems

The Ministry of Health has been implementing a comprehensive and decentralized routine health management information system (HMIS) countrywide since 2002. The system has been developed through consultative and collaborative process. In addition, the Government of Malawi has put in place a Health information system policy and strategy that provide strategic framework for the development of health information systems. The HMIS is being implemented through the Central Monitoring and Evaluation Division (CMED), which is an integral part of the Planning and Policy Development Department at the headquarters and through the District Health Management Teams (DHMTs) at the district level and focal persons at the facility level.

The system design is guided by the following principles and features:

i. Integration of all routine health information
ii. Covers both public and private facilities
iii. Service deliverers record information at facilities
iv. Paper and pen based at facility level, computerised at district level and above
v. Collects minimum data elements for computing agreed indicators
vi. Simple to establish and maintain
vii. Data collection for local analysis and use
viii. Data for appropriate decision making

Malawi has standard procedures in place in terms of information flow (Fig 1). When 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 programs and other stakeholders. Each facility compiles data from its entire catchment area and organizes review meetings with all stakeholders. The District Health Officer (DHO) compiles data from all facilities and performs comparative analyses and sends feedback to each health facility. The Ministry headquarters compiles data from all districts and central hospitals, performs necessary analysis and provides feedback to all reporters.

CMED in headquarters sends reports to program managers and provides general feedback to the DHOs and central hospitals (CH).

Program 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 diagram below shows how information is communicated between the levels.

Besides the bottom-up reporting and top down feedback mechanism as described above, HMIS 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.

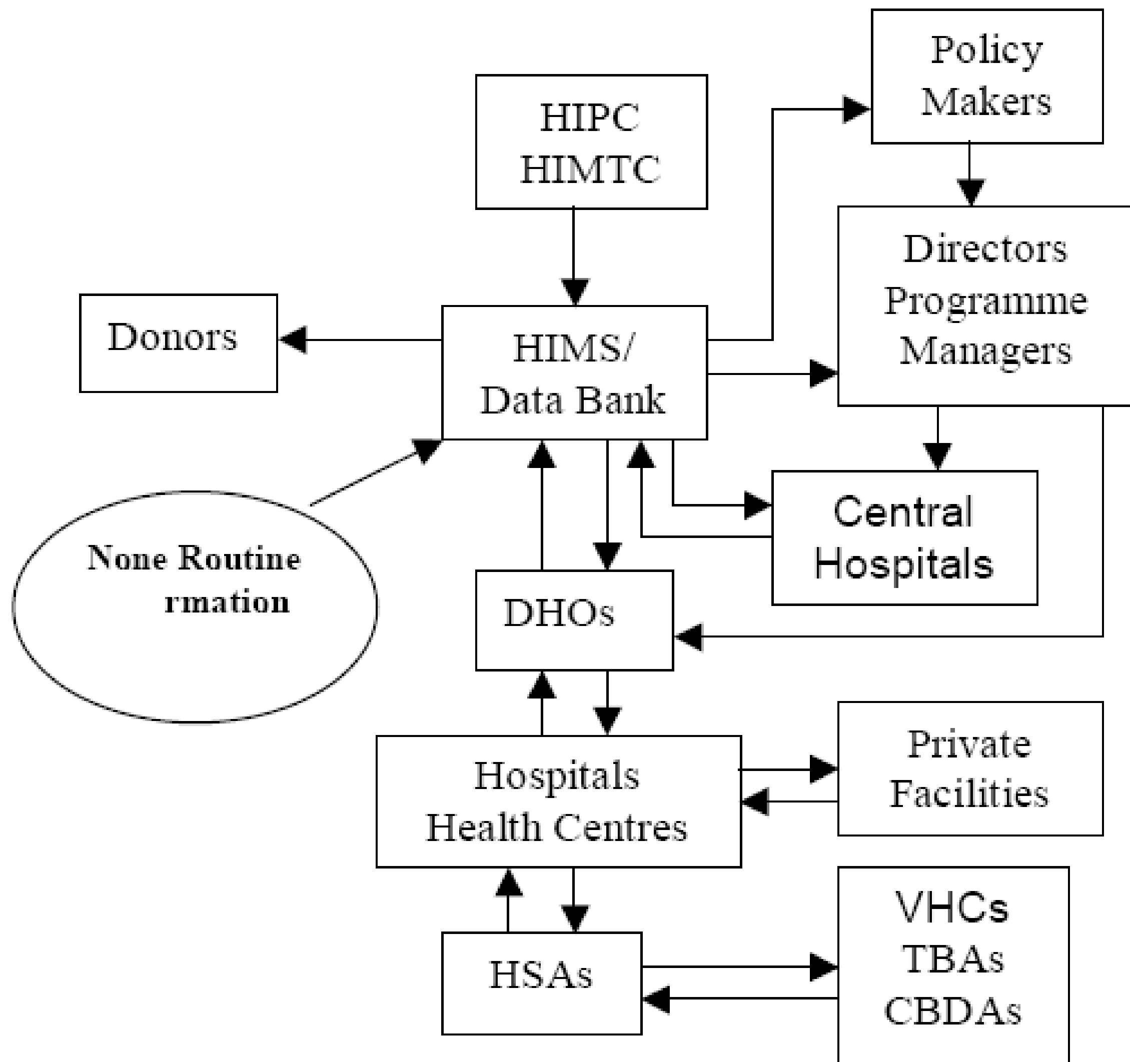

Fig 1: Data flow

The Central Monitoring and Evaluation Division (CMED) in the Department of Planning and Policy Development in the Ministry of Health is responsible for coordinating routine Health Management Information Systems (HMIS) and its subsystems of Integrated Disease Surveillance and Response (IDSR), Pension Payroll and Personnel Information System (PPPIS), Integrated Financial Management Information System (IFMIS), Physical Assets Management Information System (PAMIS), and the Logistics Management Information System (LMIS). Other data sources such as census and surveys are coordinated by the National Statistical Office (NSO) in collaboration with CMED. The Ministry of Home Affairs is responsible for vital and national registration activities.

1.5 HMIS Sub systems

Pension Payroll and Personnel Information System (PPPIS)

This system has been instituted at the central government level for managing the government payroll and pension system. This system provides necessary information required for broader human resource planning purposes. However, in the context of decentralized 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. This database will include additional information for human resource planning for the district.

Integrated Financial Management Information System (IFMIS)
The government has introduced an IFMIS at the 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 Medium Term Expenditure Framework (MTEF) budgeting system that is already operational at all levels. The IFMIS features data sets to measure progress towards equity and efficiency in the delivery of services.

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 an electronic record by facility for the entire district and the Ministry will combine electronically established records from all DHOs, Central Hospitals (CH), Central Medical Stores (CMS), Community Health Sciences Unit (CHSU) and headquarters; and analyse the current situation and plan for the future. Such records will be routinely updated when there is change due to construction, supply and rehabilitation. A thorough comprehensive updating will take place once a year. The health facility survey carried out in 2002 provides baseline data on the physical assets.

Logistics Management Information System (LMIS)
The Ministry of Health has established an integrated and comprehensive LMIS. This system provides necessary information on drugs, vaccines, contraceptives and other commodities, supplies and their use.

Research
The routine information system alone cannot supply complete information that is required by the health sector. Surveys and research play important roles in providing population-based information for planning and management of health services. However, an important data source which was not measured in the HIS Assessment is operational research. Operational research is carried out to test the efficacy and effectiveness of the interventions of national interest. The area of essential health research is 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.

1.6. Rationale for assessing and revamping health information systems

Since the introduction of the integrated HMIS in the country, there has never been an assessment of Health Information Systems (HIS). The only study ever undertaken was the

Facility and Community Assessment of the HMIS which was conducted by Calcon Consultants in 2008. However, the scope of the study was limited to functionality in terms of resources, data quality, operational status and performance at community and facility levels.

The need to conduct the HIS Assessment in Malawi has arisen from two core requirements. First, the need to enhance the entire health information and statistical systems rather than focusing only upon routine health information for specific diseases. Second, the need to concentrate efforts on strengthening country leadership for health information production and use for all partners.

Therefore, the aim of the HIS Assessment was to obtain a broad-based examination of the national system's own environment and organization, responsibilities, roles and relationships; and of the technical challenges of specific data requirements.

Chapter 2: HIS Assessment Methodologies

This chapter provides brief discussion on the framework, objectives and methodology of assessment.

2.1. Framework of the assessment

Version 4.0 of the HMN Assessment Tools provides a universally agreed standard for guiding the collection, reporting and use of health information by countries and global agencies. The framework enables all partners to harmonize and align their efforts around a shared vision of a sound and effective national health information system.

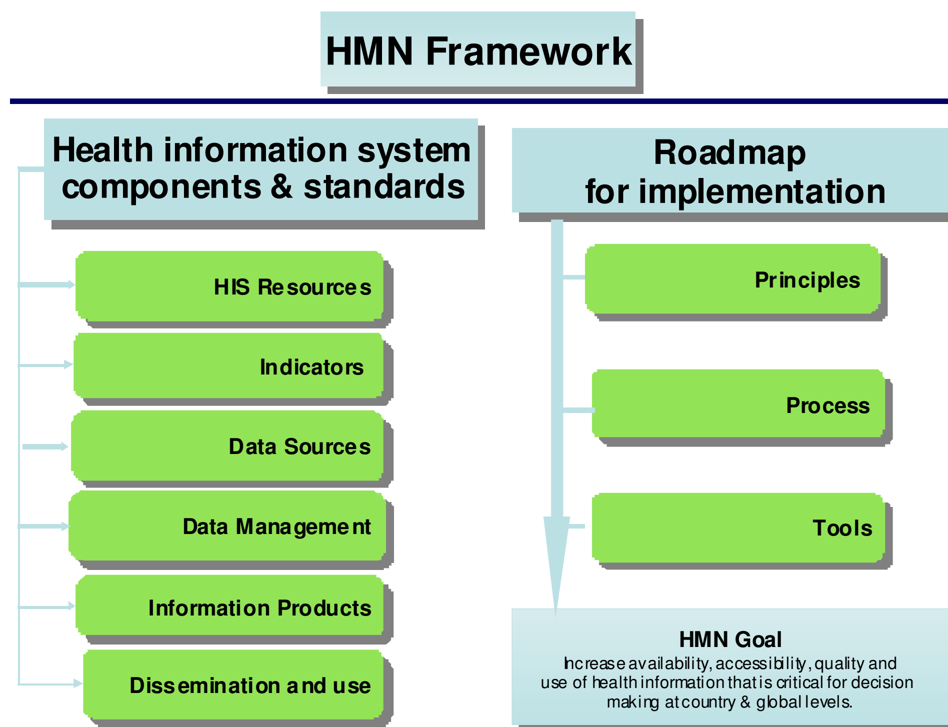

Figure 1. Health Metrics Network Framework

As shown in **Fig.1**, the HMN Framework consists of two major parts:

- **Components and Standards of a Health Information System** (left-hand column of **Fig. 1**) – which describes the six components of health information systems and provides normative standards for each.
- **Strengthening Health Information Systems** (right-hand column of **Fig. 1**) – which describes the guiding principles, processes and tools that taken together outline a ***road-map*** for strengthening health information systems.

2.2. Objective

The general objective was to conduct a country health information system (HIS) assessment with a view to create understanding, establish availability and use of quality health information in Malawi.
Specific objectives were to:

1. **Establish** an objective baseline and subsequent follow-up evaluations – assessment findings should therefore be comparable over time;
2. **Inform** stakeholders of aspects of the HIS with which they may not be familiar;
3. **Build** stakeholder consensus and understanding around the priority needs for health information system strengthening; and
4. **Mobilize** joint technical and financial support for the development and implementation of a national HIS strategic plan – with indications of the priority investments in the short term (1–2 years), intermediate term (3–9 years) and long term (10 years and beyond).

2.3. Guiding principles

The assessment was guided by the following principles:

- Country ownership and leadership in order to respond to country needs and demands
- Ensure broad based stakeholder involvement
- Ensure functional linkages between the facility based and population based data sources
- Systems approach to health information development

2.4. Methodology

The Malawi HIS Assessment process was divided into three phases: Preparatory phase, Assessment phase and Analysis and report writing phase.

The tasks involved in preparatory phase included the

- Identification of stakeholders group to take part in assessment process,
- Identification of group facilitators and orient them on assessment methodology and their role in group specific assessment exercises and
- Provision of all necessary logistics.

A national core assessment team, comprising members from Ministry of Health, Ministry of Economic Planning and Development, National Statistical Office, Christian Health Association of Malawi (CHAM), Centers for Disease Control and Prevention (CDC Malawi Office) and World Health organization (WHO Malawi Office), was established to facilitate the assessment process, to analyze assessment results and to write the assessment report.

The assessment phase was through the following process. A two day broad based HIS assessment stakeholder workshop using the HMN framework was organized from 26th to 27th May 2009 to conduct the HIS assessment. This assessment served two distinct purposes. Firstly, it provided a basis for updating the existing HMIS strategy into a broader HIS strategy that embraces HNM fundamentals and framework. Secondly, it will be a kind of mid-term evaluation of earlier efforts. The assessment helped to identify the gaps which will be systematically addressed through a strategic plan which will be developed later.

Participation in the assessment workshop was overwhelming as 68 key stakeholders from government, NGOs and private sectors participated at the workshop. These participants came from central, zonal, district and facility levels (Annex 2). However, most vertical programmes in the Ministry of Health were not represented.

On the first day, there was the official opening by the Secretary for Health. This was followed by the general session in which participants were oriented on the objectives of the assessment and the HMN principles. After the general session, there was 5 hour group exercises session. Prior to group work session participants were oriented on the HMN assessment tool. There were five groups namely policy and planning on information systems, routine health information system, population-based information systems, programmes and information systems, and finally, financing of information systems. Participants were requested to register in any group of their choice. Each sub-group had a facilitator to lead through the assessment process. These facilitators were identified and prepared in advance for the facilitation role. The assessment was complemented by the findings of the "External Assessment of Health Management Information System at Facility and Community Levels, 2008". See Box 1 below. Reference materials were also made available for the participants to refer to so that there was an objective assessment of HIS (Annex 1)

On the second day, individual group work presented in the plenary and master score sheet was updated concurrently. Summary results that were automatically generated after incorporation of group specific scores into master worksheet were presented in the plenary. Facilitation in plenary through presentation of group specific assessment results provoked discussion on key issues and building consensus on contradicting scores. All the discussions and feedback on the presentation were recorded.

On the way forward it was agreed that a working group, consisting of 3 to 5 members from the workshop participants be formed to prepare an assessment report. The assessment report working group was provided with table of contents, necessary templates and a sample assessment report for its reference. Deadline was set for the completion of draft report, circulation of draft for comments, and incorporation of feedback and comments and production of the final assessment report. The Assessment report was finally endorsed by Health Sector Review Group.

BOX 1: EXTERNAL ASSESSMENT OF HMIS AT FACILTY AND COMMUNITY LEVELS

As part of the HIS assessment, the Ministry of Health engaged consultancy services of CALCON in 2008 to conduct an external assessment of the health management information system at facility and community levels. In order to achieve a holistic overview of the system the study used a number of approaches including qualitative, quantitative, participatory and anecdotal, to provide quantitative and qualitative measures of the current performance of Malawi's health management information system, to identify functional problems that could be used to guide the design of improvements to procedures for recording and reporting, data analysis, presentation and communications and using health data for decision making and action.
Key findings of the survey:

Strengths

- The HMIS is a comprehensive and functional system
- Availability of a series of HMIS health registers have been designed, along with training manuals, to ensure that all of the key indicators are collected for use and dissemination.
- Training has been given to key personnel on how to use the registers, and is an on-going activity to ensure all health sector staff has the necessary skills.
- A system of monitoring and evaluation has also been introduced, along with checklists in order to ensure compliance, highlight any problem areas and assist in the supervision of the HMIS system.

Challenges

- Lack of some data collection and reporting tools at facility level
- Some HMIS tools, particularly the data aggregation forms are not being used as designed
- There was no correlation between HMIS records and pharmacy records therefore difficult to link cases with drugs dispensed
- Although supervisory visits were reported as being regular to all facilities, it would appear that there are problems with the quality of the visits, as they do not seem to ensure that the correct registers are being used, are complete, accurate, collected/sent in time or verified
- Communications feedback is also problematic; the feedback given to facilities is, in the main, irregular with no regular feedback forums. This lack of feedback impacts upon the quality and understanding of the HMIS system.

In order to determine the overall effectiveness of the HMIS system there is need for the system to be operational as designed. There is need to ensure the availability of registers in health facilities, an effective supervisory and monitoring and evaluation system put in place to address the problems or discrepancies that have been highlighted.

In the analysis and report writing phase the following tasks were done:

- Development of table of contents and outlining for each content - the HMN TA provided the guidelines of the report, including table of contents, necessary templates and a sample assessment report for its reference. Deadlines were set for the completion of

draft report, circulation of draft for comments, and incorporation of feedback and comments and production of the final assessment report.

- Division of chapters among group members for analysis and writing,
- Compilation of individual work into a comprehensive assessment report,
- Circulation of draft report for comments from each individual who participated in assessment exercises,
- Compilation and analysis of comments and incorporation in the assessment report,
- Approval of assessment report by the "Health Sector Coordination Committee"
- Dissemination of the assessment report to all stakeholders

Chapter 3: Assessment Results

Overall, the HIS assessment results revealed that resources are *adequate*. Despite having up-to-date legislation providing the framework for health information for notifiable diseases, there is no such legislation for private sector data including social insurance or for fundamental principles of official statistics. In regard to HIS institutions, human resources and financing, the Ministry of Health does not have adequate capacity in core health information sciences, including epidemiology, demography, statistics, and ICT. Furthermore, little if any assistance is available to health and HIS staff and national and sub-national levels in designing, managing and supporting databases and software. Finally, support for ICT equipment maintenance at national, regional, provincial and district levels are minimal.

3.1. HIS Resources

Resources

Categories	Result
Policy and Planning	Highly adequate 79% (16.6 / 21)
HIS institutions, human resources and financing	Present but not adequate 39% (15.3 / 39)
HIS Infrastructure	Present but not adequate 47% (7.0 / 15)
Overall	Adequate 52% (38.9 / 75)

Table 1. Resources

3.1.1. Policy and planning

Malawi is firmly committed to attaining an acceptable standard of health for its entire population within the shortest possible time. Three key documents, 1) The Health Policy Framework 1995; 2) "To the Year 2020: A Vision for the Health Sector in Malawi" 1999, and 3) the National Health Plan 1999-2004 have clearly described national goals and periodic targets to achieve these goals. The country has made substantial progress towards the implementation of a sector-wide approach and towards decentralization of the management of essential health care services to district assemblies.

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

In October of 2003, the Ministry of Health and Population published Malawi's first Health Information System (HIS) National Policy and Strategy document to provide a policy and strategic framework for management of health information, use of information in planning and management of health services and monitoring health sector performance.

As such, the HIS assessment revealed that Malawi has *highly adequate* policy and legal frameworks for supporting overall sector development, granted it is advisable to revisit information and communication technology (ICT) policies and infrastructures to support national HIS.

HIS plays an integral role in supporting data collection, storage, analysis, and data use for evidence-based decision making. The Ministry of Health (MOH) has embraced numerous HIS initiatives, including investment in low-cost, high impact interoperable information systems (i.e., Electronic Data Systems) and development of the National Standards Technical Working Group (formally recognized within the SWAp governance structure) (See Figure 2.), whose members are tasked with solving issues pertaining to security (e.g. National unique IDs and confidentiality); HIS enterprise architecture (including data exchange standards e.g., HL7, IXF, and technical specifications of a central repository, etc.); and standardizing/harmonizing core data sets and indicators.

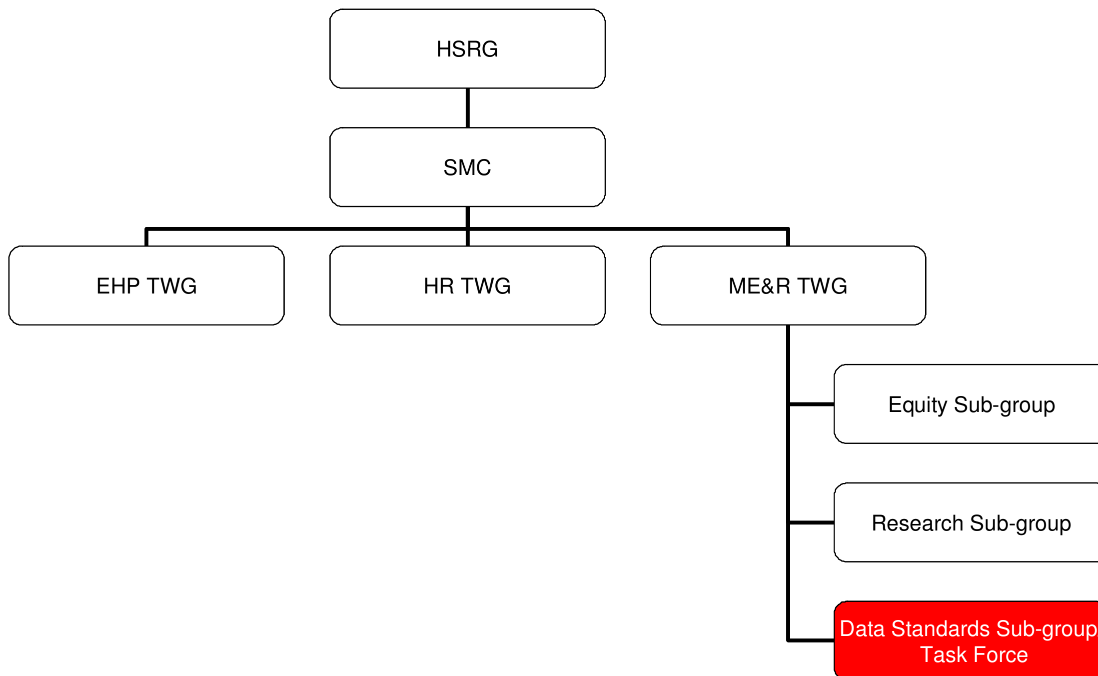

Figure 2. SWAp Governance Structure: Data Standards Task Force Reports Directly to Monitoring, Evaluation and Research TWG

3.1.2. HIS institutions, human resources and financing

The health system in Malawi is faced with serious challenges to improve health services financing and delivery and to ultimately contribute to the improvement of the health status of the population. While health needs of the population are escalating, the resources needed to meet these growing demands have not kept pace with the increasing burden of health problems.

The HIS assessment revealed that HIS institutions, human resources and finances were *present but not adequate*. The Total Health Expenditure (THE) per capita in Malawi is US$25 (2004-05) (NHA 2007) which falls -short of the $34 per capita recommended by the WHO Commission of Macroeconomics and Health (CMH) to deliver a basic health care package. US$20 (04 – 05). A summary report from Malawi's National Health Accounts (NHA) 2002/2003 – 2004/2005 revealed the following:

- Total expenditure on health accounts for 9% of total government expenditure, far less than the target of 15% set forth in the Abuja Declaration
- Major financing agent in Malawi is the Ministry of health, which controls about half of total health expenditures in 2004/05
- About 64% of all Ministry of Health expenditures occurred at hospitals, including central district and rural hospitals

There is a budget line-item dedicated towards HIS within the national budget, granted funding levels are *not adequate* for a functioning HIS for all relevant data sources in the Ministry of Health. For census and other population-based surveys, funding is sourced from development partners (i.e., DFID, USAID, Norway, etc.).

3.1.3. HIS infrastructure

HIS infrastructure was found to be *present but not adequate*. Paper recording forms, pencils and other supplies were available for recording health information, yet occasionally there are "stock-outs" of these supplies. Granted, these stock outs do not affect the recording of required information.

Computers are available at most of the relevant offices at national, zonal and district levels to permit the rapid compilation of sub-national data, but support for ICT equipment is inadequate in the provincial and district level.

HIS Connectivity

Information and Communication Technologies (ICT), including mobile communication networks and broadband communication networks, play a critical role in improving health provider performance. The current state of the telecommunications/network infrastructure in Malawi represents a significant challenge to the deployment of and support for a national HIS infrastructure. Developing a national framework for data analysis, patient referral and medical record management would not only improve data integration, data quality, and sustainability at the national level, but also maximize investments while minimizing redundant creation of

electronic reporting systems. Without a coordinated strategy, vertical health programs may decide to implement ad hoc or independent solutions to meet their needs. The risk is that such approaches may lack sufficient scalability to support the broader needs of the healthcare system.

Reliable network connectivity was identified as a high priority at the Data Standards Workshop hosted in Lilongwe in November 2008, noting that a significant proportion of health facilities lack connectivity entirely or suffer from poor quality of service from existing options. Participants encouraged the Government of Malawi to prioritize connectivity as much as they would prioritize other infrastructure activities, such as roads.

In piloting Electronic Data System (EDS) for antiretroviral therapy (ART), reliable network connectivity was recognized as an essential requirement for the broader rollout. The cost of supporting remote sites without network connectivity proved to be significantly higher than expected: a single support visit to a site costs more than a month of wireless service that would have enabled remote system management.

Establishing an integrated national health information network will require close collaboration with partner ISPs (i.e., Ultinets, Burco and others), or public-private partnerships, whose core competency involves offering and supporting broadband internet services capable of meeting the quality of service requirements of the healthcare industry. It is critical that well-defined service level agreements are established in this respect.

Therefore, it is important to define an overall strategy and roadmap for the nationwide health information infrastructure, and that the various stakeholders collaboratively establish and adhere to policies and standards with respect to use of a common network infrastructure.

Cell Phone Usage

The cell phone industry, one of the most successful industries in Malawi, has seen phenomenal growth in customer sectors, with 1.5 million subscribers registered across the TNM and Zain networks. As such, the cell phone infrastructure developed in Malawi offers clear benefits to personal communication and commerce and to leveraging existing cell phone networks to improve public health.

Several pilot projects exploring the impact of cell phones (i.e., SMS text messaging) on health have been conducted, including a pilot project in Namitete, Lilongwe district equipping volunteer health care workers with cell phones, SMS training and units in order to connect existing rural social networks to health care facilities. Providing “emergency” access for health centers to call for ambulances or to report shortages of critical supplies like antibiotics or clean bandages could dramatically improve health center’s abilities to provide care.

Hospitals, clinics, and other organizations are continuously faced with challenges of rural healthcare – namely, distance and the isolation it breeds – are set to benefit from a low-cost SMS network. Given specific steps and tools to connect individuals, SMS (“short message service”) can provide the missing link – between a hospital and its field worker, patients, support group members, or CHWs in their respective villages."

National cell phone coverage is extensive. Most district hospitals and many health centers already have coverage. By using this infrastructure to facilitate the transfer of health information, decision makers and even nurses and clinicians will be able to improve health outcomes in Malawi.

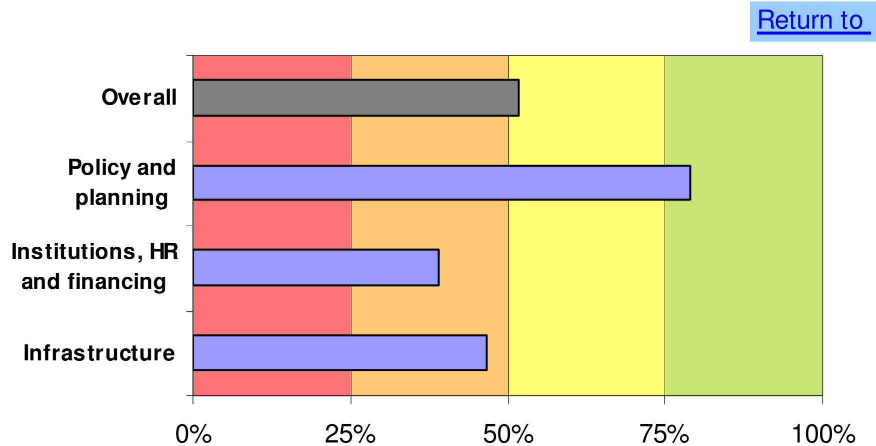

Chart 1. Results for Resources

3.2. Essential Health Indicators

The Health Sector has a comprehensive and well defined indicator set. As such, the HIS Assessment revealed that indicators are *highly adequate,* meaning national minimum core indicators have been identified for national and sub-national levels, covering all categories of health indicators (determinants of health; health system inputs, outputs, and outcomes; and health status). In addition, there is a clear and explicit official strategy for measuring each of the health-related MDG indicators relevant to Malawi.

The selection and construction of these indicators are coherent with objectives and targets set in the 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 of results (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 details about indicators are available in a separate document called 'Health Indicators Handbook'.

The HIS assessment tool only took into consideration core indicator definitions, not necessarily the completeness of the data on the indicators themselves.

3.2.1. Determinants of Health

The risk factor indicators assessed were only on smoking prevalence and were found to be *not adequate at all* for all the parameters. This is because there was no proper documentation on the work done on risk factor determinants. This shows that there is great need to come up with disaggregated risk factor indicators, devise their data collection methods, data documentation and dissemination methods.

3.2.2. Health System

Overall the health system data were found to be *adequate* in quality. This means that there are still improvements that can be done to the quality of data. Some of these indicators are collected through the HMIS and others like the tuberculosis treatment success rate under DOTS and measles vaccination coverage through the vertical programmes. Indicators on finance are compiled through the National Health Account, although at the time of this assessment, the NHA had not been consistent, with reports not being disseminated for the previous three years.

Timeliness of the data for the measles vaccination coverage and the deliveries attended by skilled health professionals was *not adequate at all*. The disaggregation of the measles vaccination data coverage was scored as *not adequate at all* while that of the deliveries attended by skilled attendants was *highly adequate*.

On the financing part, the General Government Health Expenditure (GGHE) was found to be *highly adequate* in data collection method, representativeness, and disaggregation but *present but not adequate* in timeliness and periodicity. The NHA was available for 2002-2004; 2004-2006; and the most recent one was not published yet although it was finalized. Private expenditure on health and per capita was assessed to
be *highly adequate* in data collection method, consistency, representativeness, and disaggregation but *present but not adequate* in timeliness. It can be noted from the scores that timeliness and periodicity of the health expenditure data are not strong.

The health workforce density was *highly adequate* in data disaggregation and *present but not adequate* in periodicity. The latest human resources census was done in December in 2007. However, the representativeness of the data was not scored.

3.2.3. Health Status

In Malawi the health status indicators assessed were on mortality, morbidity and HIV prevalence. These are collected through surveys like the Demographic and Health Surveys (DHS), Multiple Cluster Indicator Surveys (MICS) and the Population and Housing Census (PHC). The surveys are conducted by the National Statistical Office with the support from the Ministry of Health and other relevant stakeholders.

Overall the data collection method used was scored as *present but not adequate*. This is because the most recently published or to be published documents were based on household surveys or censuses. The consistency and data disaggregation were *highly adequate*, timeliness and periodicity were just *adequate* because it usually takes more time after data collection is done for the document to be published, and it also takes a long period of time before the data is

collected again. The data representativeness were *present but not adequate* and the adjustment method was *not adequate at all*. This indicates that the health status indicators used in Malawi need improvements in all areas except consistency and disaggregation of the data. The weakest areas revealed were the data collection methods and the data adjustment methods.

Indicators

Categories	Result
Indicators	Highly adequate 100% (15.0 / 15)

Table 2. Indicators

3.3. Data Sources

According to the HIS Assessment results, overall data sources are *adequate,* with Population-based Surveys scoring *highly adequate* but vital statistics *not adequate at all*.

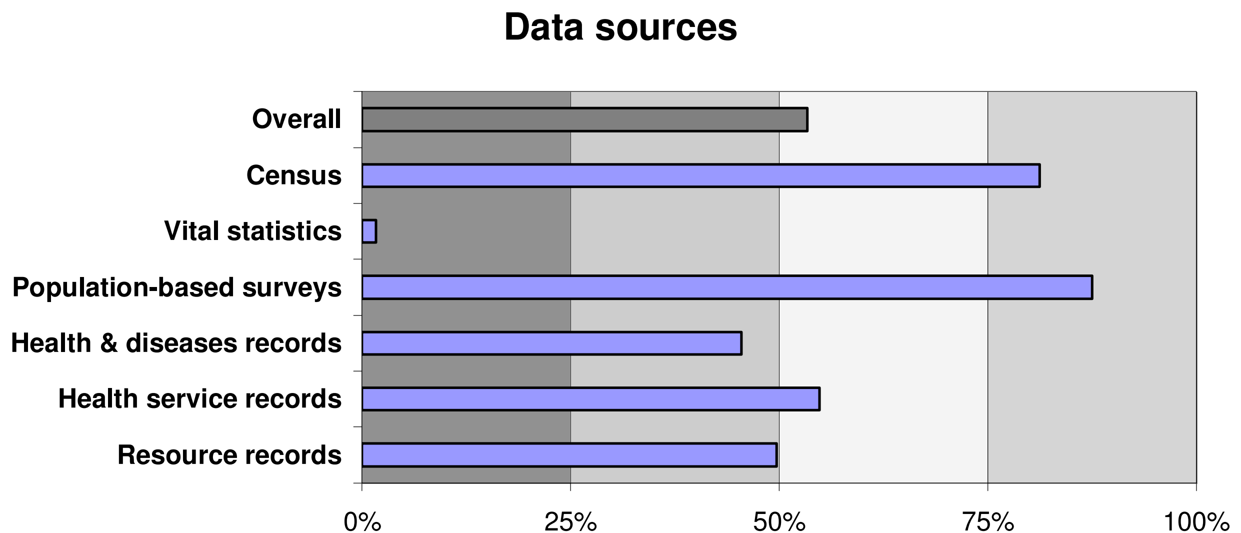

Chart 2. Data Sources

3.3.1. Census

Population data are the foundation of health management information systems. HIS Assessment results revealed that the content of census data are *highly adequate*, yet there is room for improvement in both capacity and practices (58% or *adequate*) and for dissemination of census results (67% or *adequate*).

Up to date population figures must be available for each village, each health facility catchment area, each health district and for the entire country at large in order to plan health services and to measure changes. The health system in Malawi will continue to obtain population data from the national census. The target population for each year is projected for every level using the inter-

census growth rate for that particular level. The Ministry of Health will provide its data requirements to the National Statistics Office in order to incorporate it in the decennial census.

The country conducted its Population and Housing census in 2008 and only preliminary results are currently available.

3.3.2. Civil Statistics

Results from the HIS Assessment revealed that vital statistics is *not adequate at all*, with an overall score of 2%. With the exception of sites in Karonga and Mangochi districts, there is no national system in place to capture coverage of deaths registered through civil registration; and there is limited capacity to implement data collection, process the data, and analyze the data from civil registration or Demographic Surveillance System (DSS) at district levels.

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 village development committee (VDCs) when the decentralisation and devolution concepts start fully functioning. The Ministry of Health will coordinate with Registrar General's Department, Ministry of Economic Planning and Development (EP&D), NSO, Local Government (LG) and other relevant organizations to have the vital registration system in place nationwide.

3.3.3. Population-based Surveys

Population based surveys are the main source for collection of population data and health outcome and impact indicators. The HIS Assessment revealed that population-based data are *highly adequate*, yet the content area is *adequate* with room for improvement. . For example, in the past 5 years, a nationally representative survey has measured the percentage of the relevant population receiving key maternal and child health services (e.g., family planning, antenatal care, professionally attended deliveries, and immunizations).

The Demographic and Health Survey (DHS) is the main household survey that is carried out every four years. The next DHS will be conducted in 2009. Impact indicators generated from the DHS include among others, life expectancy, infant mortality rate, total fertility rate, under five mortality rate, crude death rate, neonatal mortality rate and maternal mortality rate. Other population based surveys undertaken in the country include the Multi Indicator Cluster Survey (MICS) done every two years, the Welfare Monitoring Survey (WMS) and the Integrated Household Survey (IHS) conducted yearly.

3.3.4. Individual Records

The HIS Assessment revealed that individual records are available and highly adequate. They are used for keeping individual data and as a monitoring tool by the individual. Three client health passports for child, woman and general have been introduced in all public and private health facilities to improve the quality of health care. The health passports 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. The woman health passport contains specific information on tetanus toxoid injection, family planning services, antenatal check-ups, obstetric history and postnatal services as well as general history. The general health passport is used by men for continuous recording the diagnosis and care provided. These health passports are also used as monitoring tools at individual level.
The Village Health Register (VHR) has been designed to collect data and document health services and problems at community level. The Community Health Workers especially Health Surveillance Assistants (HSA) use the Village Health Register to record community health activities and vital events, track trends over time, and facilitate the community-based organizations in planning and implementing community health activities. The VHR is an important step in the development of a nationwide vital registration system. However, the HIS assessment tool does not contain items to be assessed at that level.

3.3.5. Health Service Records Including Surveillance

Routine health management information systems have been established in all health facilities, yet HIS assessment results reveal that health and disease records (including surveillance) are *present but not adequate*, with capacity and practices as well as dissemination needing improvements.

All health facilities in the country use standardized data collection, compilation and reporting tools. The service providers at health facility use registers to record data as they provide services Data compilation is done on daily basis and figures are added to monthly figures, analyzed, discussed and decisions are taken for improvement. A set of tools (Wall Charts) is used for data aggregation and monitoring at facility level.

The contents for key epidemic-prone diseases (e.g., cholera, diarrhea with blood, measles, meningitis, plague, viral hemorrhage fevers, yellow fever, SARS, bird flu) and diseases targeted for eradication and/or elimination (e.g., poliomyelitis, neonatal tetanus, leprosy) appropriate case definitions have been established and cases can be reported using the current reporting format. Yet the ability to map specific at-risk populations (e.g., populations with high levels of malnutrition and poverty) and of general population exposed to specific risks (e.g., vectors, and environmental and industrial pollution) is greatly lacking.

Capacity is also lacking, with less than 25% of health workers making primary diagnoses who can correctly cite the case definitions of the majority of notifiable diseases. Use of facility-retained patient medical records to support quality and continuity of care is also lacking since essential patient information is usually not recorded and/or records cannot be retrieved for most patients.

DHO use each facility-specific data for routine monitoring as well as for planning and management of health services at local and district levels. National level analysis is done for the whole country.

Communicable diseases continue to be a major cause of morbidity and mortality in Malawi. Occurrence of notifiable diseases will be timely analyzed, investigated and fed to the

management at facility, district and national levels for their appropriate response. Data collection on notifiable diseases will be an integral part of disease surveillance carried out by the HMIS system. The IDSR will add investigation of disease and prompt reporting to the people responsible for response.

Surveys are very expensive methods of data collection. Therefore, several rapid assessments are carried out on an ad hoc basis in order to furnish quantitative and qualitative data on concurrent health issues. Specifically, exit interviews 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 are done annually.

Quality of data that are 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 country programs in the wrong direction. Therefore, it is necessary to establish a system that provides cross checks on countrywide data as well as generating more accurate data to determine 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.
- Accessibility by road in all seasons.

Sentinel sites and all other health facilities in the entire country 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 are made to optimize the quality of data collected from all health facilities in the entire country.

- At least quarterly verification of individual record and monthly data by District Health Management Team (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 are compulsory for sentinel facilities. Additional support is provided to the sentinel facilities that are required for improvement of data quality.

3.3.6. Resource Records

The HIS Assessment revealed that resource records were *present but not adequate*. The following information systems are included in the category of resource records:

3.3.6.1. Infrastructure and Health Services

The HIS assessment has revealed that the records related to infrastructure and health services are *present but not adequate*. The MoH maintains a data base of public facilities with a unique identifier. However, other institutions such as NSO also maintain their own database for the same facilities. In short, there is no national database of public and private health facilities and the coding system does not permit integrated data management. GPS coordinates for public health facilities exists but is not adequate. This needs updating as new facilities have been established.

Human resources and equipment for maintaining and updating the data base and maps are *not adequate* at all due to limited capacity at both central and district levels. GPS equipment was supplied at district level more than three years ago but is not used because of HR capacity limitations. The current data base of public facilities was updated more than three years ago.

With regards to dissemination, maps are *present but not adequate*. While maps may be available in some districts, they are not up to date. Integration and use of infrastructure and health services data is not adequate at all. Managers at both national and district levels rarely link information about the location of health facilities and health services to the distribution of the population. Efforts are however being made in ART services and distribution of the population.

3.3.6.2 Human Resources

The current human resources records are *not adequate at all*. There is no national data base for tracking the annual numbers of graduates from all health training institutions. Each training institution maintains its own data base of graduates. The Ministry of Health conducted in 2008 a Human Resources for Health (HRH) census as a basis for establishing a national HR data base. The MOH has engaged the services of a United Nations Volunteer (UNV) to assist in the establishment of the data base at national and district levels. The national human resources (HR) database will be able to track the number of health professionals by major professional category working in the public sector.

3.3.6.3 Financing and Expenditure for Health Services

There is a system for tracking budget and expenditure by government and donors although not everything might be captured. The National Health Accounts (NHA) provides data on financing and expenditure for health services. The recent NHA was conducted in May 2008 provides the general NHA and sub accounts for HIV/AIDS, Reproductive health and Child Health, TB and Malaria from both public and private sectors. Expenditure on other individual diseases is not captured.

3.3.6.4 Equipment, Supplies and Commodities

The reporting system on equipment, supplies and commodities is *highly adequate*. Each public facility maintains and report on the inventory and status of equipment and physical infrastructure every quarter. Each public facility also reports on its levels of supplies and commodities in the public sector. However there is incomplete reporting on equipment and physical infrastructure due to capacity limitations to manage physical infrastructure and logistics. The assessment revealed that the reporting systems for different supplies and commodities are fully integrated in the public sector.

III. Data Sources

Data Source	Contents	Capacity & Practices	Dissemination	Integration and use	Total
Census	Highly adequate 100% (3.0 / 3)	Adequate 58% (7.0 / 12)	Adequate 67% (8.0 / 12)	Highly adequate 100% (3.0 / 3)	Highly adequate 81%
Vital statistics	Not adequate at all 0% (0.0 / 6)	Not adequate at all 7% (1.0 / 15)	Not adequate at all 0% (0.0 / 3)	Not adequate at all 0% (0.0 / 3)	Not adequate at all 2%
Population-based surveys	Adequate 67% (6.0 / 9)	Highly adequate 100% (12.0 / 12)	Highly adequate 83% (5.0 / 6)	Highly adequate 100% (6.0 / 6)	Highly adequate 88%
Health and disease records (incl. surveillance)	Adequate 56% (5.0 / 9)	Present but not adequate 43% (9.0 / 21)	Present but not adequate 33% (1.0 / 3)	Adequate 50% (3.0 / 6)	Present but not adequate 45%
Health service records	Highly adequate 83% (5.0 / 6)	Present but not adequate 42% (5.0 / 12)	Adequate 50% (3.0 / 6)	Present but not adequate 44% (4.0 / 9)	Adequate 55%
Resource records	Adequate 69% (16.5 / 24)	Present but not adequate 47% (14.0 / 30)	Present but not adequate 33% (2.0 / 6)	Adequate 50% (6.0 / 12)	Present but not adequate 50%
Total					Adequate 53%

Table 3. Data Sources

3.4. Data Management

The HIS Assessment revealed that Data Management at the national level is *present but not adequate*. Challenges remain at district and lower levels where capacity in terms of human resources and Information Communication Technology (ICT) infrastructure is *not adequate*. No national or sub-national data warehouse exists; and no metadata dictionary which provides comprehensive definitions about the data exists. Identifier codes are available within similar databases, but no standardized unique identifiers exist, hence making it difficult to exchange data across databases.

Data Management

Categories	Result
Data management	Present but not adequate 27% (4.0 / 15)

Table 4. Data Management

Malawi does have standard procedures in place in terms of information flow. When local health staff recognize 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 programs and other stakeholders. Each facility compiles data from its entire catchment area and organizes review meetings with all stakeholders. The District Health Officer (DHO) compiles data from all facilities and performs comparative analyses and sends feedback to each health facility. The Ministry headquarters compiles data from all districts and central hospitals, performs necessary analysis and provides feedback to all reporters.

HMIS in headquarters sends reports to program managers and provides general feedback to the DHOs and central hospitals (CH).

Program 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 diagram below shows how information is communicated between the levels.

Besides the bottom-up reporting and top down feedback mechanism as described above, HMIS 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.

3.4.1 Written Set of Procedures.

HIS assessment has revealed that written set of procedures are available and *adequate.* Data management is guided by procedures contained in the HMIS Training and Reference manual and the Health Information System Policy and Strategy documents. However these procedures are partially implemented due to capacity limitations.

3.4.2 Data Warehouse

Data warehouse is *not adequate at all*. There is no national or sub national data warehouse. The assessment has shown that there is no integrated data ware house at all levels that contain data from all data sources. Efforts are underway to establish data warehouse. A National Data Standards Task force has been mandated to take forward.

3.4.3 Data Dictionary

Data dictionary was found to be *not adequate at all*. The HIS assessment results have shown that no metadata dictionary exists to provide comprehensive definitions about the data. However, an Indicator Handbook was developed which defines the indicator, data use in the indicators, source of data, significance of the indicator, and defines use of indicator at different levels and programmes. The National Data Standards Task Force has been given the responsibility to establish a metadata dictionary.

3.4.4 Unique Identifier Codes

The assessment has revealed that identifier codes are *present but not adequate*. Identifier codes are available within similar databases, but no standardized unique identifiers exist, hence making it difficult to exchange data across databases. The National Data Standards Task force has been constituted to move this forward.

3.5. Information products

In general the quality of Health Information Systems (HIS) / information products in Malawi was found to be *adequate* to a level of 64% (103.0 / 162).The assessment examined the major HIS components which are health status indicators, health system indicators and risk factor indicators in terms of their data collection methods, timeliness, periodicity, consistency, representativeness, disaggregation and adjustment methods used. The health status indicators and the health system indicators were found to be *adequate* but the risk factor indicators were all *inadequate*. This could be attributed to the lack of proper documentation on work done on risk factor determinants, especially on smoking prevalence.

Information Products

Categories	Overall
Information Products	Adequate 64% (103.0 / 162)

Table 5. Information Products

3.5.1. Health Status Data

In Malawi the health status indicators assessed were on mortality, morbidity and HIV prevalence. These are collected through surveys like the Demographic and Health Surveys (DHS), Multiple Cluster Indicator Surveys (MICS) and the Population and Housing Census (PHC). The surveys are conducted by the National Statistical Office with the support from the Ministry of Health and other relevant stakeholders.

Overall the data collection method used was scored as *present but not adequate*. This is because the most recently published or to be published documents were based on household surveys or

censuses. The consistency and data disaggregation were *highly adequate*, timeliness and periodicity were just *adequate* because it usually takes more time after data collection is done for the document to be published and it also takes a long period of time before the data is collected again. The data representativeness were *present but not adequate* and the adjustment method was *not adequate at all*. This indicates that the health status indicators used in Malawi need improvements in all areas except consistency and disaggregation of the data. The weakest areas revealed were the data collection methods and the data adjustment methods.

3.5.2. Health System Data

Overall the health system data were found to be *adequate* in quality. This means that there are still improvements that can be done to the quality of data. Some of these indicators are collected through the HMIS and others like the tuberculosis treatment success rate under DOTS and measles vaccination coverage through the vertical programmes. Indicators on finance are compiled through the National Health Account, although at the time of this assessment, the NHA had not been consistent, with reports not being disseminated for the previous three years.

Timeliness of the data for the measles vaccination coverage and the deliveries attended by skilled health professionals was *not adequate at all*. The disaggregation of the measles vaccination data coverage was scored as *not adequate at all* while that of the deliveries attended by skilled attendants was *highly adequate*.

On the financing part the General Government Health Expenditure (GGHE) was found to be *highly adequate* in data collection method, representativeness, and disaggregation but *present but not adequate* in timeliness and periodicity. The NHA was available for 2002-2004; 2004-2006; and the most recent one was not published yet although it was finalized. Private expenditure on health and per capita was assessed to be *highly adequate* in data collection method, consistency, representativeness, and disaggregation but *present but not adequate* in timeliness. It can be noted from the scores that timeliness and periodicity of the health expenditure data are not strong.

The health workforce density was *highly adequate* in data disaggregation and *present but not adequate* in periodicity. The latest human resources census was done in December in 2007. However, the representativeness of the data was not scored.

3.5.3. Risk Factor Data

The risk factor indicators assessed were only on smoking prevalence and were found to be *not adequate at all* for all the parameters. This is because there was no proper documentation on the work done on risk factor determinants. This shows that there is great need to come up with disaggregated risk factor indicators, devise their data collection methods, data documentation and dissemination methods.

3.6. Dissemination and Use

Well generated data and/or information on health are meaningless unless they are widely disseminated and used to facilitate evidence-based decision - making. However, lack of evidence – based decision making may not necessarily be due to technical issues related to data generation but institutional and behavioral barriers and lack of incentives that hinder the effective use of the information. This section assessed the extent to which data and information on health is disseminated and used by actors in the health sector in particular, producers themselves, donors, health-care professionals, managers, statisticians, planners and policy-makers, etc. It specifically assessed the following areas, namely, demand and analysis, policy and advocacy, planning and priority setting, resource allocation, and finally implementation and action. The results are given in Table 6.

VI. Dissemination and Use

Categories	Result
Analysis and use of information	Present but not adequate 33% (3.0 / 9)
Information use for policy and advocacy	Present but not adequate 33% (1.0 / 3)
Information use for planning and priority setting	Adequate 67% (2.0 / 3)
Information use for resource allocation	Adequate 67% (4.0 / 6)
Information use for implementation and action	Adequate 67% (6.0 / 9)
Overall	Adequate 53% (16.0 / 30)

Table 6. Dissemination and Use

3.6.1. Demand and Analysis

The findings imply that there is a demand for data; however, it is ad hoc (*present but not adequate*, 33%). The managers demand data once they are approached by other users like politicians, media, consultants, etc. In addition, the use of graphs and maps to disseminate information on health is *not adequate* in the sense that few facilities use them; and where used, they are rarely up to date and hardly understood. This explains existing capacity problems and attitude in some health facilities.

3.6.2. Policy and Advocacy

The Health Management Information System (HMIS) produces and disseminate regularly bulletins from routine sources. It reports on all core indicators that are measurable annually but exclude those that are from population-based surveys. Legally, it is the task of the National Statistics Office to design and administer population-based surveys. However, the Ministry provides an input on variables to be included in the design of the population-based surveys. As such, the content of the bulletins falls short of integration and comprehensiveness.

3.6.3. Planning and Priority Setting

The result of the assessment shows that health information is commonly and *adequately* (67%) used for diagnostic purposes to describe health problems and or challenges. However, health information is not consistently used in planning frameworks and resource allocation processes.

3.6.4. Resources Allocation

The outcome of the assessment indicates that HMIS information is *adequately* used (67%) in targeting and proposal budgeting. Additionally, equitable and increased resource allocation to disadvantaged groups and communities is to some extent backed by the information extracted from the HMIS.

3.6.5. Implementation and Action

The assessment suggests that managers and care providers are *adequately* using health information for health service delivery management, monitoring and periodic evaluation. However, this utilization is limited at national and zonal level. Further efforts should be made to explore why districts are not using the health information for health service delivery, management, continuous monitoring and periodic evaluation. Again, utilization of information on health risk-factor is adequate and regular. This is mostly on communicable diseases and generally not tailored to each vulnerable group.

In conclusion, overall, it finds that information generated from the HMIS is *adequately* disseminated and used in planning and priority setting, resources allocation, service delivery management, and monitoring and evaluation (53%). However, analysis and use of information for policy change and advocacy are *present but not adequate* because there is almost no demand for data from managers unless it is induced by other users like the politicians, media, etc. On the other, the information circulated through HMIS Bulletins is not inclusive as it does not report on population based-issues.

3.7. Summary of the HIS Assessment and Policy Implications

In short, the HIS assessment revealed key areas of concern as we begin to develop the HIS strategic plan. Ultimately, HIS institutions, human resources and financing, vital statistics, data management and dissemination and use will need vast improvements.

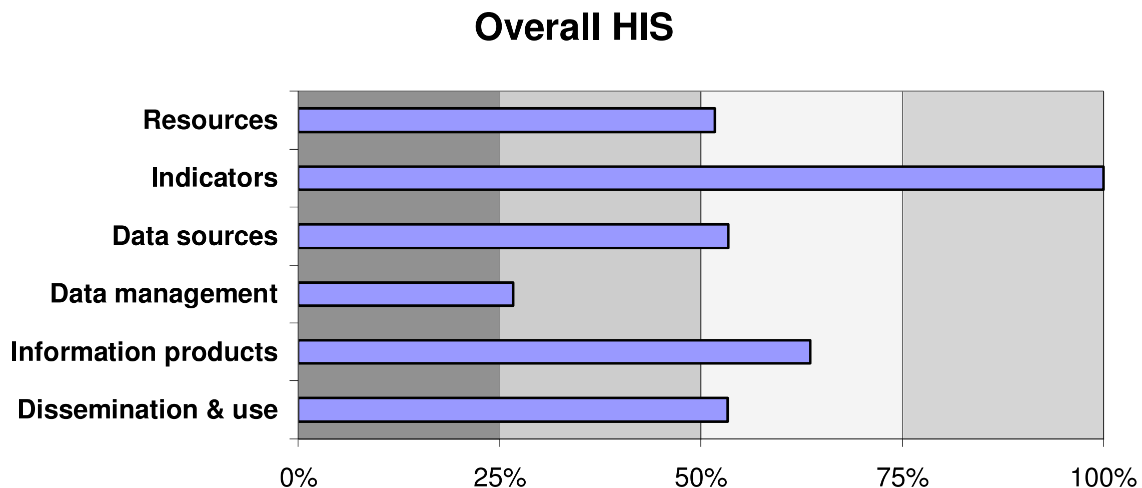

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Chart 4. Overall HIS Results

Resources	52%
Policy and planning	79%
Institutions, human resources & financing	39%
Infrastructure	47%
Indicators	**100%**
Data sources	**53%**
Census	81%
Vital statistics	2%
Population-based surveys	88%
Health & diseases records	45%
Health service records	55%
Resource records	50%
Data management	**27%**
Information products	**64%**
Dissemination & use	**53%**

Table 7. Overall HIS Results

Chapter 4: Way Forward

This chapter provides additional analysis of strengths and weaknesses of existing systems and identifies potential areas of interventions in all six components of the HIS. …(I think it would be more than excellent if we could provide elaboration on gaps by component)

Components and sub-components	**Major gaps**
I. HIS resources	
HIS coordination, planning, and policies	Old legal framework Limited inter face between facility and community information systems Revisit the HIS policy No ICT policy for health
Financial and human resources	Human Resource limitations in terms of quality and quantity Inadequate financial resources especially at district and facility level
HIS Infrastructure	Frequent stock out of supplies Limited support for ICT equipment maintenance No reliable network connectivity
II. Health indicators	
	Data collection problems HMIS reported data not disaggregated by age and sex Indicators on determinants of health not adequate Data quality in terms of completeness, consistency and timeliness No data adjustment methods used on routine HMIS data
III. Data sources	
1 Census	
Civil registration	No national civil registration system
Population surveys	
Individual records	Non availability of Health passports at facility level
Service records	Limited capacity of health workers Practices not in line with procedures Low data quality Limited dissemination especially at district and facility levels
Resource records	
Infrastructure and health services	No national data base of public and private facilities No integrated data management Limited HR capacity for data base maintenance and use of GIS

Human Resources	No national HR data base in place
Financing and expenditure for health services	No comprehensive information on private expenditure Expenditure on other diseases not captured
Equipment, supplies and commodities	Incomplete reports due to limited capacity to manage physical infrastructure and logistics
IV. Data management	
	Weak ICT infrastructure especially at district and facility levels No data warehouse No meta data dictionary No standardized unique identifier
V. Information products	
Determinants of health	No risk factors indicators
Health system	Timeliness of data Disaggregation of data by age, sex and geographic location
Health status	Data collection method problems No data representativeness No data adjustment methods
VI. Information dissemination and use	
Demand and analysis	Demand of data on ad hoc basis Limited analysis of HMIS data due to capacity limitations Use of graphs and maps not regular
Policy and advocacy	Content of HMIS bulletins lacks integration and comprehensiveness
Planning and priority setting	
Resource allocation	
Implementation and action	Limited utilization of data for policy and advocacy at national and zonal levels

4.1. Analysis of Strength, Weakness, Opportunity and Threat

Strengths

- Development of a comprehensive and decentralized health management information system using DHIS software. Well defined system of data collection, processing and transmission from the facility up to the national level
- Health information system policy and strategy has been developed and approved by the Ministry of Health
- HMIS/M&E activities included in the joint POW for SWAp
- A functional Central Monitoring and Evaluation that coordinates HMIS/M&E activities in the Ministry of Health
- Availability of a well defined national core indicators for the health sector.
- Basic ICT infrastructure at district and central levels that facilitate data processing, report generation, transmission and feedback

- Population based surveys follow international standards for confidentiality and adhere to ethics
- DHO/DHMT financial support on HMIS/M&E activities like follow ups of report and HMIS quarterly meetings
- HMIS data bank maintained at district and central levels
- Use of various channels for dissemination of information such as reports, website, meetings
- Functional M&E Technical Working Group within SWAp governance structure for providing technical advice in all matters relating to M&E
- Development of capacity building plan for HMIS/M&E activities

Weaknesses

- Huge deficit in human resources (quality and quantity) especially at district and facility levels
- Some sub systems are not yet fully developed and therefore, unable to provide the required data in appropriate formats
- Low data quality in terms of completeness, reliability and timeliness
- Weak linkages between various sources of data; lack of triangulation of information collected from various sources
- Limited data analysis and use of information in the management of health services especially at facility and district levels. Some vertical programs continue to collect and use their own sets of data and indicators.
- No HMIS curriculum in health pre-training institutions
- Low compliance of private sector in reporting HMIS data
- Lack of data warehouse for all HIS data sources
- Poor coverage of and use of information from vital statistics
- No ICT policy for the health sector

Opportunities

- Technical and financial support from development partners for strengthening HIS. HMN support, to strengthen HMIS through review of existing system & development of sound M&E plans through a participatory approach; possible financial support from development partners such as World Bank supported malaria booster 2 strategy, Financial support from UNICEF for revision of core indicators and CDC support for HIS activities, including national roll-out of electronic data systems, central data warehouse within the Ministry of Health, and support for the National Data Standards Task Force.
- Piloting initiatives for data capture, analysis and use. Stakeholder interest in piloting and roll-out of ART M&E electronic Data Systems, piloting and scaling up of non-monetary incentives for data quality and timeliness, piloting of electronic patient management information system at facility level
- Integration of community and facility based health data
- Introduction of quality assurance into HMIS
- Harmonisation and integration with M&E systems for HIV/AIDS, and HRH
- Implement capacity development plan
- Improve advocacy and implementation of vital registration nationwide
- Establishment of national data standards task force to assist with the development of a national warehouse and repository
- Introduction of health informatics courses in Universities in Malawi for capacity building in HIS in the country

Threats

- High staff turn over
- Donor driven vertical programmes establish own parallel reporting systems, putting pressure on already overburdened health workers

- Donor fatigue in supporting the country

4.2. Recommendations on Potential Development Areas with Existing Resources

- Develop a strategy for strengthening vital registration
- Develop and implement an HMIS/M&E pre service curriculum for health workers
- Develop and implement the ICT policy for health
- Strengthen linkages between Demographic Health Surveillance (DSS), community and facility based information systems
- Support the development of the national data warehouse
- Introduce electronic patient management information system in the country
- Support the implementation of the capacity improvement plan
- Review and update the health information system policy and strategy
- Review the core health sector indictors to incorporate current initiatives
- Need to harmonize and align the various M&E systems
- Introduce incentives for data quality and use of information in decision making processes at all levels
- Improve compliance of private health facilities in HMIS data reporting
- Update the legal and regulatory framework for HIS
- Establish public-private partnerships to ensure widespread connectivity

4.3. Opportunities for Donor Coordination

Opportunities exist for donor coordination across multiple areas of Health Information Systems. Currently, HIS strengthening activities are being supported by PEPFAR, Global Fund, Universities and other organizations. Since all agencies can benefit from a coordinated, national health information system, it is important to have one coordinating body that can garner support across the various groups for on-going financial needs.

4.4. Critical Next Steps

Results from the HIS Assessment will help inform the development of the HIS strategic plan, which will include a comprehensive costed plan as well as a timeline for addressing key issues.

Annex 1: References

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10. Ministry of Health, National Health Accounts, 2007
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12. Ministry of Health, Health Management Information System Annual Bulletin 2007-08

Annex 2

How was the HIS Assessment Organized? --
Summary Report

Your answers to the following questions will provide lessons on how best to organize an assessment of a health information system

1. **Name of country:__**MALAWI**__________________**

2. **Members of the stakeholder group** (please list all organizations that participated in the planning and execution of the assessment including producers, users and sources of finance for health information)
   Ministry of Health
   Ministry of Economic Planning and Development
   Christian Health Association of Malawi
   Centres for Disease Control
   World Health Organization

3. **Which unit or units took the lead in organizing the assessment?** (e.g. "Central Statistics Office" or "M&E unit of the Ministry of Health", etc…)
   Central Monitoring and Evaluation Division of the Ministry of Health

4. **Please describe briefly how the assessment was organized.** How many separate meetings were held? Include meetings for planning the assessment as well as meeting for carrying out the assessment. This includes how many meetings of the full stakeholder group? This includes how many meetings of smaller worker group?

   A smaller group was constituted with a mandate to organize the assessment workshop. It comprised members from the Ministry of Health, Ministry of Economic Planning and Development, Christian Health Association of Malawi, Centres for Disease Control Malawi Office and World Health Organization.

   The HIS Assessment exercise was divided into three phases: preparatory phase, assessment phase, and analysis and report writing phase. Four meetings were organized during the preparatory phase for the identification of stakeholders group to participate in the assessment process and sending of invitations, identification of a group facilitators, adaptation of the assessment tools (assessment tool and group builder tools), development of the facilitators guide to be used in group work, orientation of facilitators on the assessment tools, objectives and methodology and their role in group specific assessment exercises and follow up on the invitation and confirmation of participants and logistics of the workshop

   The following process was undertaken in the assessment phase:

   The full stakeholder group assessment workshop was for two days. The first day was for orientation of participants on purpose and methodology of assessment, formation of sub-groups with appropriate allocation of participants into different groups. Ensure adequate

facilitation support in each group to ensure correct scoring of each assessment question. During the second day there were presentations in plenary of group specific assessment results which provoked discussion on key issues and building consensus on contradicting scores. A way forward was highlighted which included the formation of a small group for analysis of assessment results and writing an assessment report.

The tasks involved in analysis and report writing phase included the sharing the sections among the small group members for analysis and drafting the assessment report. The was followed by compilation of individual work into a comprehensive assessment report. The draft report was circulated all individuals that participated in assessment exercises for their inputs. This was followed by the compilation and analysis of comments and incorporation in the assessment report. The report was presented to the M&E technical working group for their approval. Dissemination of the assessment report to all stakeholders.

5. Meetings of smaller working groups -- Were subsets of items assessed by smaller working groups? YES or NO

If yes, in the space below, indicate the number and types of participants (for example, "program managers" or "central statistics office and other statisticians and demographers" or "donors"), the number of items they assessed and the approximate number of hours that they met to assess these items

Number and types of participants (See List in 8 below)	Number of items	Number of hours
a) Group A: Routine health information system	41	5.5
b) Group B: Population based information system	59	5.5
c) Group C: Policy on HIS	20	5.5
d) Group D: Programmes and HIS	31	5.5
e) Group E: Resources for HIS	45	4.5
f)		
g)		
h)		

6. What role, if any was played by a national or international consultant?

An international technical assistance support was sought from the HMN Secretariat to facilitate the HIS assessment workshop. Specifically the TA, among others things:

- Assisted in the planning of the assessment workshop
- Oriented the local facilitators and policy makers on the purpose and methodology of assessment
- Provided facilitation support to participants to ensure correct scoring of each assessment question
- Facilitated in plenary through presentation of group specific assessment results, provoking discussion on key issues and building consensus on contradicting scores
- Provided guidance in the analysis of assessment results and writing an assessment report
- Build capacity within the country in conducting assessments and developing strategic plans

7. Was a national consensus conference organized to conclude the assessment and review the findings?
YES

8. If YES, please list all the organizations that were represented and indicate the number of participants.

No	NAME	POSITION	PLACE OF WORK	EMAIL ADDRESS	GROUP
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2	Mafase Sesani	Health Inf. Officer	CHAM	mafase@cham.org.mw	Group A
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29	Chris Moyo	Deputy Director, Central M&E Division	MoH	moyochris@gmail.com	Group C
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9. Briefly describe any modifications that were made to the assessment tool. Also note if the tool was translated.

No modification was made and the tool was not translated

10. List the item# of any items that were omitted from the assessment because they were judged to be inappropriate

Some items were omitted during the assessment work not because they were judged to be inappropriate but because there was need for further consultation with the appropriate authorities who were not present during the workshop

11. **List the item# of any items that were not well understood. Please offer any suggestions for clarifying the meaning of specific items**

12. **Describe any special problems you had with organizing the assessment**

13. **Has the final report on the assessment been completed?**

    YES

14. **How much time was required to complete the assessment process -- from the first planning meeting until the concluding meeting, how many weeks elapsed?**
    TWO MONTHS

15. **Please offer any further comments or recommendations on how to improve the assessment tool or how to organize a successful assessment** (use a separate sheet of paper if necessary)
    a) For a meaningful assessment, the assessment tool should be user friendly. In most cases the items to be assessed could not clearly fit in the scoring categories. The combination of the statement and the scoring categories confused the participants.
    b) Community based information system items are missing in the assessment tool. It is felt that this should be included in the tool as this is a growing area that needs to be supported.
    c) We did not see the importance of the group builder tool in the assessment. It is not a helpful tool in the assessment process.