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Republic of Zambia
Ministry of Health

Assessment of the Health Information System in Zambia

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Foreword

It is evident that increased investment in health is dependent upon improved evidence of positive changes in health outcomes. As such, there is a critical need for good health information. In recognition of this, global efforts have been targeted towards strengthening the Health Information Systems (HIS) in all countries, more especially the developing countries. It is believed that improved HIS would enhance evidence based policy making leading to improve accountability and effectiveness at all levels of the health system.

In Zambia, the increased demand for health information and the potential opportunity to supply it calls for an investment in building a sustainable national HIS. Zambia will benefit greatly if a HIS that is based upon a policy framework and national strategic plan covering core indicators, data collection and management, analysis, and dissemination and use strategies existed.

The strengthened HIS will focus upon improving the availability and utilisation of sound health information for policy-making and planning, programme monitoring and evaluation (including the Millennium Development Goals) and measuring equity in health. Through collaboration with Health Metrics Network and other Cooperating Partners, my Ministry will work on strengthening the capacity of the HIS so that it provides quality and timely information in a form that is applicable at national, sub-national and district levels. Such a system will be necessary to enhance the efficiency and effectiveness of the assistance provided by investors in the health sector.

Given the above background, the Ministry of Health and the Health Metrics Network (HMN) entered into an agreement in 2006 in which Zambia would receive support to (i) conduct a country assessment on the HIS, and (ii) to develop a National HIS Strategic Plan. This report, therefore, provides an overview of the HIS in Zambia and covers all the six components of the HMN framework. It highlights how the HIS is operating in Zambia, remaining and anticipated challenges, and policy recommendations.

It is my expectation that the data provided is sufficient enough and that it will be used in the development of the HIS Strategic Plan. I wish to implore all key players in the health sector to use this assessment report as a tool to guide the development of the HIS Strategic Plan and its implementation.

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Acknowledgements

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List of Abbreviations

CSO	Central Statistical Office
DHIO	District Health Information Officer
DHMT	District Health Management Team
DHO	District Health Office
DHS	Demographic and Health Survey
DLMIS	Drug Logistics Management Information System
EU	European Union
FAMS	Financial & Administrative Management System
GIS	Geographic Information System
HFC	Health Facilities Census
HIS	Health Information System
HMIS	Health Management Information System
HRIS	Human Resources Information System
IDSR	Integrated Disease Surveillance and Response
M&E	Monitoring and Evaluation
MCH	Maternal and Child Health
MDGs	Millennium Development Goals
MoFNP	Ministry of Finance and National Planning
MoH	Ministry of Health
NHA	National Health Accounts
PRSP	Poverty Reduction Strategy Paper
SAG	Sector Advisory Group
STI	Sexually Transmitted Infection
SWAp	Sector Wide Approach
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
WHO	World Health Organization

1.0   INTRODUCTION

A Health Information System (HIS) is an integral part of the health system whose operational boundaries include all resources, organisations and actors that are involved in the regulation, financing and provision of actions whose primary intent is to protect, promote and improve health.

There are different users and uses of information. Patients, communities, service providers, programme managers, policy-makers, providers of funds, global agencies and organizations all need information in order to gauge the performance of the health system, their actions, and quality of services provided. A range of health-measurement areas are assessed and this includes information on mortality and morbidity rates; disease outbreaks; determinants of health (such as nutrition, environment, and socioeconomic status); access, coverage and quality of services; costs and expenditures; and equity.

Various tools and data collection methods are available including vital registration and census systems; household, facility and district surveys; routine clinic-based data collection systems; disease surveillance systems; national health accounts; and modeling. The prime objective of this assessment was to evaluate the available resources to collect data; data sources; data management, dissemination and use in Zambia. It was also necessary to assess how the users and uses of information are integrated and if they are consistent with internationally accepted tools and methods of data collection.

2.0   OVERVIEW OF THE HIS IN ZAMBIA

The Directorate of Planning and Development in the Ministry of Health is responsible for coordinating HMIS, IDSR, HFC, HRIS, DLMIS, FAMS and NHA activities in Zambia. Other components of the HIS such as demographic and health surveys, household surveys and Census' of Population and Housing are coordinated by the Central Statistics Office (CSO) in close collaboration with the Monitoring and Evaluation (M&E) unit of the Ministry of Health (MoH). For vital statistics and national registration, the Ministry of Home Affairs (Department of National Registration and Citizenship) is charged with this responsibility. HMIS, IDSR, HFC, HRIS, DLMIS, and FAMS are used to collect routine data while NHA, demographic and health surveys, household surveys and Census' of Population and Housing are conducted periodically.

Though the HMIS and other routine administrative and management systems such as the NHA, HRIS, DLMIS are used at different levels of the Zambian health care delivery system to collect and report data, there is no proper integration. It is also clear that the data which is collected by other institutions such as the CSO (demographic, health, household and population surveys) and the Ministry of Home Affairs (vital registration) is not adequately integrated with data collected by the MoH. It has also been noticed that donors that are

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providing support towards vertical programs such as HIV/AIDS, TB and Malaria have also introduced new systems that are not integrated with the HMIS.

Due to inadequate integration, there has been an overlap in the flow of information; inadequacy/incompleteness of information that is collected; and poor analysis and use of the information. This has in turn led to gaps in knowledge on the impact of interventions; duplication of efforts; and huge transaction costs in terms of time spent to produce reports. A well coordinated HIS calls for the integration of data from all data sources and other management systems with the benefit of better management of data; dissemination and use; reduced duplication of efforts; and lesser transaction costs.

2.1   Health Management Information System (HMIS)

The HMIS was established in the MoH in 1996 and at the moment it covers all the health facilities that are found in all the 72 districts of Zambia. However, its presence is insignificant in second and third level hospitals facilities. The difference in the level of presence of the system can be attributed to the initial implementation plan which focused on primary level health information systems and not secondary and tertiary level. The HMIS currently captures data on disease morbidity and mortality, maternal and child health services, service delivery (staff workload, health facilities utilization, availability of essential drugs etc.), surveillance and financial services. Environmental health and administrative data are also captured on an ad hoc basis.   HMIS data collection is conducted at the health facility level using a paper based system and is aggregated and computerised from district to national level.

2.2   Integrated Disease Surveillance and Response (IDSR)

The IDSR compliments the HMIS and was adopted in 2000 in order to lessen the impact of epidemics in relation to mortality, morbidity, social disruption and indeed to contribute to global and regional needs for disease surveillance. The IDSR covers 11 notifiable diseases which are reported on immediately they are diagnosed to the next levels in order to avoid possible outbreaks. The 11 notifiable diseases that are vigilantly reported on are: Acute Flaccid Paralysis (AFP); Measles; Neonatal Tetanus; Dysentery; Cholera; Plague; Rabies; Typhoid Fever; Yellow Fever; Tuberculosis (TB) and Human Influenza.

2.3   Financial and Administrative Management System (FAMS)

FAMS is a routine financial and administration management system implemented in all districts to provide a simple, comprehensive, accountable and transparent financial and administrative management. FAMS was introduced in 1996 with the linkage to computerized procedures using Navision in 1997. Currently all districts are operating on the FAMS with a cash book, a system of ledgers, forms and procedures. FAMS is adequately documented and fully complies with the local and internationally accepted accounting principles.

2.4 **Zambia Demographic and Health Survey (ZDHS) and Living Conditions Monitoring Survey (LCMS)**

Other health and health related information is periodically captured through the Census of Population and Housing (conducted every ten years), and surveys such as the ZDHS (conducted every 5 years) and the LCMS (conducted every 2 to 3 years). ZDHS and LCMS collect data on mortality, morbidity, determinants of health and socio-economic status', coverage and access, health seeking behaviour, and disease prevalence.

3.0 OBJECTIVES OF THE HIS ASSESSMENT

3.1 General Objective

- To conduct a country Health Information System (HIS) assessment to establish the availability and use of timely, reliable health information.

3.2 Specific Objectives

- To establish a baseline and follow-up evaluation of the HIS that will be comparable over time.

- To determine stakeholder awareness and understanding of the HIS.

- To use the results of the assessment to build stakeholder consensus and participation on the HIS.

- To use assessment findings to develop a strategic plan and mobilize resources for the HIS.

- Determine performance of overall HIS and the level of functional integration with respect to data quality, collection, processing, analysis and use of information.

4.0 GUIDING PRINCIPLES

- Country ownership and stakeholder involvement
- Link health, national registration and statistical constituencies
- Systems approach to health information

5.0   METHODOLOGY

Data collection was done over a two weeks period in five provinces namely Copperbelt, Eastern, Luapula, Lusaka and North-Western. The data collection teams comprised of members from Central Statistical Office, Ministry of Health, World Health Organisation, the Tropical Disease Research Centre and National Malaria Control Centre.

The HMN version 1.97 tool was adapted and used for data collection. This tool was developed by WHO/HMN and based on the framework for assessing country health information systems.

With the guide from the HMN country health information systems strengthening document, key informant interviews were conducted with various stakeholders including policy makers, programme managers, and researchers from the MoH and government line ministries/institutions (including second and third level hospitals, CSO, Ministry of Home Affairs, Ministry of Local Government and Housing) at district, provincial and headquarters, and the donor community (SIDA, DFID, CDC, WHO, CIDA, EU).

The data that was generated from the interviews was then inputted into the HMN Tool and analyzed by a team of officers from various stakeholders. The results were later disseminated for wider stakeholder review and consensus building.

6.0   HIS COMPONENTS AND STANDARDS

All the 6 components and standards of a HIS as contained in the HMN version 1.97 tool including Resources; Indicators; Data Sources; Data Management; Information Products; and Dissemination and Use were assessed. Other than data management, dissemination and use of information which were not adequate, it was found out that the HIS resources, indicators, data sources and information products were adequate. Presented below are the findings and comments under each component.

6.1   RESOURCES

Summary	Result
Policy and Planning	Adequate
HIS institutions, human resources and financing	Present but not adequate
HIS Infrastructure	Adequate
Overall	Adequate

6.1.1   Policy and Planning

It was established that Zambia has up-to-date legislation providing the framework for health information covering vital registration, notifiable diseases, confidentiality, and fundamental principles of official statistics. However, though legislation on vital registration was present, enforcement is weak. In addition, legislation on social health insurance is not present although there is some legislation on private health insurance. There is also no legislative mechanism to collect information from private health institutions.

There was no written policy or HIS strategic plan but all the components in the HMN Framework are being implemented at national, provincial and district levels. Relatedly, there is no written policy to promote a culture of information use throughout the health system, though the senior managers do act as role models in the use of information collected from routine and periodic surveys. It was also noted that all levels of the health system operate under written guidelines on data collection, management and analysis.

The assessment revealed that the Ministry of Health has official legislation to conduct regular meetings at facility, district and other levels to review HIS information and take action based upon the information. The Monitoring and Evaluation (M&E) technical working group was found to be functional and responsible for the coordination of the HIS in the country. The M&E unit, in conjunction with the Sector Advisory Group (SAG) also monitors the performance of the HIS and its various sub-systems. It was also disclosed that the MoH and other line Ministries providing health and health related data usually conducted ad hoc meetings where issues of common interests are discussed. At the time of the research, the HMIS was being reviewed.

6.1.2   HIS Institutions, Human Resources and Financing

The assessment revealed that HIS institutions, human resources and finances were present but not adequate. Specifically, there was national capacity in core health information sciences to meet basic health information needs in the MoH and outside the MoH but the numbers and mix were insufficient. Some officers at sub-national levels had been designated as full time health information officers without formal training in health information management. Further, there was insufficient capacity building that took place to update officers on the latest trends as well as to improve their analytical skills. This problem is compounded by the high staff turnover rate in the health sector due to a human resources crisis (MoH, 2004). This has resulted in the replacement of staff who may have an in-depth understanding of the system by other cadres with no previous training in information management.

As earlier stated, there is an M&E unit in the MoH which is responsible for the design, development and support of health information collection, management, analysis, dissemination and use for planning and management. Written guidelines for HIS data

collection, management and analysis also exist and are used, although they are not fully integrated into overall service supervision.

6.1.3 HIS Infrastructure

HIS infrastructure was on the whole found to be adequate. The assessment revealed that a complete list of public sector health facilities was present and that it is updated annually. However, this was not the case with private health facilities whereby the listing is out of date and covers less than 50% of the facilities.

Paper recording forms, pencils and other supplies were available for recording health information but frequent 'stock outs' of these materials was being experienced. However, this has not greatly affected the ability to record the required information. It was also noted that all the key managers at district, regional and national levels had access to computers and basic information communication technology (ICT) infrastructure (computers, telephones/fax, radio and Internet in some places. Despite this distribution of ICT, several health facilities at districts level only had radio communication equipment.

The other shortcoming in the area of infrastructure was poor ICT, equipment maintenance support even though this had no effect on data and information reporting requirements.

6.2 INDICATORS

Summary	Result
Indicators	Highly adequate

Overall, the indicators were found to be highly adequate and meet the criteria of usefulness, scientific soundness, reliability, representativeness, feasibility, and accessibility. The set of national core indicators covers determinants of health; outputs, outcomes, and health status and are collected at all levels of the Zambian health care delivery system. Reporting on these indicators is done on a quarterly basis through the HMIS reporting system and disseminated biannually through the SAG meetings. The SAG meetings draw their membership from all the key stakeholder operating in the health sector including MoH and government line ministries/institutions; private-for-profit and not-for-profit NGOs; and donor community (multilateral and bilateral). The civil society, however, is not represented at the SAG meetings.

The national indicators do satisfactorily measure progress towards the attainment of the health-related MDGs.

6.3 DATA SOURCES

Zambia has in existence a number of data sources i.e. Vital Registration, Census, Population and household surveys, Health and disease records, Health service Records as well as Administrative records. Some of these data sources are housed within the MoH while others are in the CSO, Ministry of Home Affairs and the Ministry of Local Government and Housing. Regardless of the ministry/institution where they fall, they still play an important role in the general HIS. These data sources may not be integrated due to the different institutions where they fall but they are indirectly linked. These indirect linkages have brought about gaps in information flows and un-coordinated information provision to users.

Data Source	Contents	Capacity & Practices	Dissemination	Integration and use	Total
Census	Adequate	Adequate	Adequate	Adequate	Adequate
Vital statistics	Present but not adequate	Not adequate	Adequate	Adequate	Adequate
Population-based surveys	Highly adequate	Highly adequate	Highly adequate	Present but not adequate	Highly adequate
Health and disease records (incl. disease surveillance sys.)	Adequate	Adequate	Highly adequate	Adequate	Adequate
Health service records	Present but not adequate	Present but not adequate	Adequate	Present but not adequate	Present but not adequate
Administrative records	Adequate	Present but not adequate	Present but not adequate	Present but not adequate	Present but not adequate

6.3.1 Census

The Census as a source of health data was found to be adequate and the greatest strength was that a census is conducted every 10 years. Other strengths were that the country had micro-data that were available for public access. It was also established that Zambia had adequate capacity to collect, process and analyse data. It was also responded that reports covering descriptive statistics from the recent census were widely distributed. Further, adequate accurate population projection by age, sex and residence were available.

The Census of Population and Housing was undertaken in October and November 2000. The reports presenting a detailed analysis of the issues on the evaluation, coverage and content errors were disseminated in November 2003. The reports were widely distributed through the statistical offices in all the provincial headquarters but there was a time lag of 3 years between the time that data was collected and the time that the reports were disseminated. The data in the reports were disaggregated by age, sex, geographical (provincial and districts) location and residence. Some data was further disaggregated by broad age groups, citizenship, marital status and so on.

Micro-data of the census were also available on request. The Census data was also used to create a population projection report which contains information which is disaggregated by age, sex and residence (provincial, district, rural and urban).

To evaluate the quality of the data, a Post Enumeration Survey (PES) was conducted. Sample households were revisited after the census and data was collected again. This data was compared with the data collected during the actual census. The matching of the two sets of data was used to evaluate the quality of the census data.

6.3.2   Vital Statistics

The vital registration system is a function of the Ministry of Home Affairs under the National Registration Office. Overall, the operations of this system was found to be adequate though the contents, capacities and practices were not adequate. In terms of content, the vital registration system in Zambia covers both Births and Deaths. Though the births and deaths are recorded at health facilities throughout the country, the issuance of birth certificates is handled by the National Registration Office at central level. For deaths, the certificates are issued by qualified medical personnel at hospitals and zonal health centres and records sent to the National Registration Office for registration and issuance of burial permits. In some of the outlaying areas, however, some of the deaths are not recorded (especially when burial permits are not issued), and the deaths remain unregistered.

The findings also revealed that the completeness of the data collected was assessed on an annual basis and a number of weaknesses on the coverage of deaths were revealed. It was also leant that there were problems with the classification of deaths in accordance with the International Statistical Classification of Diseases and Related Health Problems. Other weaknesses were that sample registration systems and demographic surveillance systems were not used to collect data on vital registrations.

Lastly, though the lag between the time that vital statistics are published and the time that the data is collected was good, the information that is collected is not widely used for national and sub-national analyses.

6.3.3   Population Based Surveys

The general picture was that population-based surveys provided highly adequate information on health but that integration and use of this information was not adequate. It was reported that nationally representative population-based surveys had been conducted in the last 5 years with the following strengths:

- measurement of the percentage of the relevant population receiving key maternal and child health services
- reasonably precise and accurate estimation of infant and under-five mortality
- measurement of the prevalence of some priority non-communicable diseases / health problems (e.g. cancers, disability, oral and mental illnesses). However, surveys on accidents, violence and leading risk factors (e.g. smoking, drug use, diet, physical inactivity) have not been done.
- Surveys followed international standards for consent, confidentiality, and access to personal data
- The data allows for disaggregation by socio-economic status, sex, age, and geographical region
- Metadata and microdata were available from recent surveys

The weaknesses found in this data source were that there were insufficient regular meetings and multi-year plans to coordinate the timing, the key variables measured nor the funding of surveys which measure health indicators. Respondents also felt that there was a weak link between the MoH and CSO in the use of the data even though they did, to some extent, work together on the survey design, implementation and data analysis.

Sub-sections 6.3.3.1 and 6.3.3.2, below, provide detailed information on two population-based surveys the Living Conditions Monitoring Survey and the Demographic and Health Survey which are conducted every 3 and 5 years, respectively.

6.3.3.1   Living Conditions Monitoring Survey (LCMS)

The Living Conditions Monitoring Survey collects information on the health status of individuals. Information on health consultations and health facilities visited is obtained from individuals in the survey. Respondents are asked questions on reported illnesses or injury over a two weeks period prior to the survey. The LCMS provides sufficient information on various indicators including:

- The prevalence of illnesses
- The symptoms suffered
- The amount of money spent on medication and/or consultation
- The source of medication
- The type of personnel or institution that attended to the patient

- If the individual was admitted and duration of admission
- The mode of payment used for medical services
- If the patient had suffered for a period exceeding 3 months
- If the individual failed to carry out normal activities due to illness or injury.

The prevalence of persons reporting illness is collected for various diseases, including non-communicable diseases. The LCMS has a separate chapter on child health and nutrition which has information on child feeding practices (breastfeeding and feeding of solids), immunization (BCG, DPT, Polio and Measles) and Anthropometric data (Child's age, Height and Weight). Under-five and Infant Mortality are collected under deaths in the household which are reported under the demographic characteristics of the population.

The LCMS has data which is disaggregated by province, age group, sex, residence (rural and urban) and stratum (small scale, medium scale, large scale, fish farming, non-agricultural, low cost, medium cost and high cost). Metadata and microdata of the recent survey are also available on request.

6.3.3.2   Zambia Demographic Health Survey (ZDHS)

The Zambia Demographic Health Survey is a nationally representative survey of men and women of reproductive age. It is an important part of the surveillance system and provides indicators for the strategic management and monitoring of the health sector in Zambia. Indicators from the survey show the current status and trends in important areas of health care delivery such as environmental health, reproductive health, maternal health, child health, sexually transmitted infections and HIV/AIDS. The survey is also a major source of information about health seeking behaviour regarding individuals and communities. Fertility and mortality indicators, which gauge the overall health status of the population, are also provided in the ZDHS.

Data collected in the ZDHS is disaggregated by age, sex, marital status, residence (rural, urban and province). In some cases, the data is also disaggregated by other variables such as background characteristics and educational level.

The ZDHS is conducted every four to five years by the Central Statistical Office in collaboration with Ministry of Health, The University Teaching Hospital, The Tropical Diseases Research Centre, The National Food and Nutrition Commission, The University of Zambia Demography Division and other stakeholders. The last ZDHS was conducted in 2001-2002 and at the time of the HMN assessment, officers from MoH and CSO were in the field collecting data for the 2007 ZDHS.

6.3.4 Health and Disease Records (including Disease Surveillance)

Health and disease records, including disease surveillance systems were found to be adequate to meet the county's health information needs. This was especially true in the area of dissemination of such information. It was found out that appropriate case definitions of epidemic prone diseases, and diseases targeted for eradication and eliminations had been established and cases were being reported on. This proved to be one of the strongest points in this area. It was also found out that major public health diseases which are the leading causes of morbidity and mortality in Zambia (Malaria, TB, HIV/AIDS, Respiratory Infection: non-pneumonia, Diarrheoa: non-bloody, and Respiratory Infection: pneumonia) were being measured and that an assessment strategy exists and is reflected in appropriate plans and structures. However, mapping of public health risks and populations at risk is either negligible or completely absent except for Malaria.

The health and disease records are collected in the health facilities using tally sheets and registers which are then compiled monthly to produce quarterly reports. In terms of capacities and practices, MoH had the requisite capacity to diagnose, record, analyse and report on notifiable diseases and public health interventions but the percentage of health facilities submitting report on time was between 75 to 89%. It was also noted that MoH has been producing Health Statistical Bulletins (which includes IDSR data) since 1999. However, the availability of the HMIS bulletins at district health offices is low.

The MoH with strong collaboration with the Centers for Disease Control and Prevention (CDC) has initiated the Continuity of Care "Smart Card Project" as the national standard software to be used for all Anti-Retroviral Therapy (ART) services in clinics with electricity, as part of the general HMIS system. The aim of the SmartCare Application to provide continuous electronic medical records for patients and involves storing personal health information on a smart card.

The Centre for Infectious Diseases Research in Zambia (CIDRZ) and the MoH in Lusaka district currently run the SmartCare system in over 40 health facilities. In Kafue district, installation of the application has been done in roughly 15 rural antenatal sites, targeting antenatal, mother to child, and voluntary counseling and testing services but able to support ART services. The SmartCare system is yet to be fully rolled out to other provinces and districts and doesn't cover other general out/in patient services.

6.3.5 Health Service Records

It was found out that health service records were present but not adequate. This is because Zambia had no health services based information system that brings together data from the public and private facilities. Further, though clinical and operational guidelines, and regulatory institutions are available in Zambia, there no systematic approach to evaluating the quality of health services provided by private health facilities. For public health institutions, the Directorate of Technical Support Services under the MoH (working in collaboration with

Provincial Health Offices) conducts regular supervisory visits and quarterly performance assessments in order to evaluate the quality of health services provided.

There are inadequate numbers of formally trained health information specialists as there is no institution in Zambia that exclusively offers long term training in health information. This is despite the country having designated full time positions in health information in all the districts. Training in health information is provided through national and international short courses and workshops though this is not regularly done.

While all the health facilities have statistics based on head counts, census statistical projections are also used to calculate the coverage rates. Dissemination, integration and use seemed to be problematic. This is because an annual summary of health services for all the diseases has not been produced for over 3 years except for the HIV/AIDS service provision survey report which was done in 2005. It was also noted that reporting for Tuberculosis wasn't well integrated with the general health service reporting system.

6.3.6 Administrative Records

Beside the routine data collection systems i.e. the HMIS and the IDSR there are other administrative and management systems on finances, Human Resource, and drugs. Though these systems are in place, their existence is not adequate to meet the required demands. In addition, due to the existence of a human resources crisis, the capacity to maintain and update the various databases is insufficient.

6.3.6.1   Database/ mapping of infrastructure and health services

The country situation was that the mapping of health services was present but not adequate. The strength was seen in the two listings for the health facilities i.e. the listing of health facilities report of 2002, and the Ministry of Health /JICA health facility census listing.

A database as well as mapping of infrastructure and health services exists. This was facilitated by the Ministry of Health and JICA through a conducted Health Facility Census. This database provides a listing of all public facilities in the country. Further information on the geographical locations of the health facilities is also provided through maps produced from the GPS coordinates collected. The main weakness in the mapping is that it mainly concentrated on plotting the geographical locations of public health facilities. Private health facilities, health staff and other key services were not adequately plotted.

Nonetheless, there is an effort by decision makers to use this information to evaluate the physical access to the services by linking the information about the location and the health services to the distribution of the population and equitable distribution of resources according the needs. The facility census generated information is also being used to necessitate the development of a capital investment plan.

6.3.6.2 Human Resources Information System

A Human Resource Information System exists in the MoH though this system is not frequently updated and used. The system was designed to aid the provision of accurate and timely data on the health worker statistics by profession for improved human resources planning. However, this is not the case as the system is not regularly updated. Further, statistics from training institutions on the numbers of graduates is collected directly from the respective training institutions and it is almost impossible to obtain this data from the MoH headquarters. Attrition statistics indicating the number of people leaving the sector through death, migration and other reasons is also not readily available.

6.3.6.3 Financial Data Sources

Health service financing information is provided through the National Health Accounts (NHA). Budgetary allocations and expenditures from all the main sources of finance (government, donors, private, and households) is collected. This data is disaggregated by national and sub-national levels.

The ultimate goal with regard to the NHA is to institutionalize and regularize the undertaking of the NHA within the MoH. The non-institutionalization of the NHA and lack of full time staff working on the NHA has however, not affected the provision of NHA data. This is because staff from the Planning Department of the MoH are contracted on short term basis' to collect, analyse and disseminate NHA data. More support on the NHA is provided by the University of Zambia, Swedish Government, and the World Health Organisation.

NHA data is collected every two years with a publicity and dissemination time lag of one year. It has however not always been possible to produce the NHA regularly and in a timely manner due to time and resource constraints. The last available report is for 2004 and work to update the NHA to 2006 is yet to begin. NHA findings are routinely disseminated through Sector Advisory Meetings attended by donors, health managers, civil society and other interested parties.

The other aspect is the degree of detail of the current NHA reports which only show health expenditure by financing source, financing agent, level, and provider but not by disease category. The information from the NHA is used to formulate policies aimed at enhancing equity and efficiency in resource mobilization and allocation. It is also used in assessing whether there is a linkage between policy and practice.

Other than the NHA, data on health care financing is available through the Financial and Administrative Management System (FAMS) which is housed at the MoH. It was also found out that a Public Expenditure Tracking (PET) survey had been conducted in 2006 and that data was being analysed. The PET survey was done in 5 provinces and covered more than 40 of the 73 districts in Zambia.

6.3.6.4   Database on Equipment, supplies and commodities

As a way of improving health care delivery, all health facilities are requested to report on the stocks of all health commodities such as drugs, vaccines, contraceptives and other supplies on a quarterly basis. These commodities are received as complete quarterly reports except on ad hoc basis when there were stock-outs. It has also been evident that despite having parallel reporting forms for different commodities, the integration of these forms is adequate.

Despite the reporting system being adequate, this area lacked skilled human resource for managing the logistics of equipment, drugs and medical supplies. This was attributed to the human resources crisis in Zambia, the low graduation rates of this cadre from the professional training schools and an uneven distribution of staff which is more bias towards urban areas.

6.4   DATA MANAGEMENT

Overall, the country's data management performance practices were found to be poor.

Summary	Result
Data management	Not adequate

- Standard procedures for data management i.e. data collection, storage, cleaning, quality control and presentation were available but these were being implemented partially.

- There was lack of an integrated data warehouse containing data from all data sources (population and facility based sources including all key health programs) at all levels.

- There is a metadata dictionary which provides data variable definitions as well as their use in indicators, specification of data collection method, periodicity, geographic designations, analysis techniques used and possible biases. This is especially true for population-based surveys and the HMIS. However, some of the definitions and specifications are not provided and these dictionaries are not widely available at district levels.

- Identifier codes are available within similar databases but these do not match between different databases.

6.5   INFORMATION PRODUCTS

Overall, the quality of the health indicators (both health status and health system) was found to be adequate except in the area of disaggregation. However, it appeared that the quality of the risk factors indicators was not adequate.

Marking Indicators	Health status			Health system indicators	Risk factors indicators	Overall health indicators quality
Elements for assessing selected indicators	*Mortality*	*Morbidity*	Overall			
Data collection method	Present but not adequate	Adequate	Present but not adequate	Adequate	Adequate	Adequate
Timeliness	Adequate	Adequate	Adequate	Adequate	Present but not adequate	Adequate
Periodicity	Adequate	Adequate	Adequate	Adequate	Present but not adequate	Adequate
Consistency / completeness	Adequate	Adequate	Adequate	Adequate	Present but not adequate	Adequate
Representativeness / appropriateness	Adequate	Adequate	Adequate	Adequate	Adequate	Adequate
Disaggregation	Adequate	Adequate	Adequate	Present but not adequate	Present but not adequate	Present but not adequate
Estimation method / transparency	Highly adequate		Highly adequate	Adequate		Highly adequate
Overall assessment of results	Adequate	Adequate	Adequate	Adequate	Present but not adequate	Adequate

6.5.1   Health Status Indicators

In Zambia, health status indicators are collected through surveys such as the ZDHS and the LCMS. The CSO in collaboration with the MoH, coordinates the collection of this data. Assessment of the quality of these indicators in terms of timeliness, periodicity, consistency, representativeness, disaggregation, and estimation methods showed that the health status indicators were adequate. This implies that the health status indicators which are used in Zambia do sufficiently provide accurate and reliable data. The only weakness was on the data collection method which was found to be inadequate. The health status indictors are collected using indirect methods from household surveys or census where model

questionnaires (developed by the MEASURE DHS+) are applied. The most ideal data collection source that would provide empirical evidence is the vital registration.

6.5.2   Health System Indicators

The quality of the health system indicators was also found to be adequate. The health systems indicators are collected routinely by the MoH through the HMIS. The HMIS indicators provide information on the performance of the health system (including human resources and drug supplies), and disease burden which includes incidence and case fatality rates. For indicators on finances, this data is complied through the NHA. It was disclosed that data audits are conducted in each province by the centre annually, with the aim of verifying the data for completeness and consistency.

In general, all the health systems indicators had adequately met the data quality assessment criteria but it was found out that the data is not disaggregated by gender, socio-economic status, and demographic characteristics. The other problem was on the population estimates. It was noted that there are some discrepancies between CSO population projections as compared to actual headcount populations in communities surrounding the various public health facilities as conducted by the MoH. The CSO population figures were lower than the MoH headcount populations and this led to population coverages of over 100% especially for indicators such as the fully immunized children.

6.5.3   Risk Factors Indicators

The picture under the risk factors indicators was poor. The results imply that health risk factor assessments are either rarely done or are done on an adhoc basis. Only a few assessments on risk factors such as violence against women, housing characteristics, household amenities and access to facilities, and HIV/AIDS/STI-related knowledge and behaviour are collected through the ZDHS and the LCMS. Risk factor assessments on smoking, alcholosim, etc are not collected. It follows that the HIS may not have adequate information to provide the Zambian populace with knowledge on what the risk factors are on their health.

6.6   DISSEMINATION AND USE

The findings under dissemination and use of information on the whole were adequate. This is with the exception of policy and advocacy and resource allocation. It was felt that information was not widely disseminated to all the potential users in Zambia while its usage in resource allocation was also insufficient.

Summary	Result
Analysis and Use of Information	Adequate
Policy and Advocacy	Present but not adequate
Planning & Priority Setting	Adequate
Resource allocation	Present but not adequate
Implementation / action	Adequate
Overall	Adequate

6.6.1   Analysis and Use of information

Analysis and use of health information in Zambia was found to be adequate. The continuous demand for good quality and timely health information was seen as a strength in this area. Exchange of information was being done through the Sector Wide Approach (SWAp) coordination meetings (Annual Consultative meetings; Biannual Sector Advisory Group meetings; monthly policy meetings; monitoring & evaluation committee meetings; and other technical working group meetings.) which draw membership from government line ministries, donors, NGOs, and other stake holders in the health sector.

The information collected is displayed in form of graphs at sub-national and district levels. The country, it was noted, had recently conducted a health facilities census which has enabled the generation of up-to-date maps on the geographical location of health facilities. The assessment also revealed that indicators on health information that is collected through the HMIS is widely used at all levels of the health care delivery system. However, other data that is collected from the districts is rarely used for decision making.

6.6.2   Policy and Advocacy

Generally, there was some advocacy in the use of information but this was not adequate. HIS summary reports, more especially information from the HMIS, the census, and surveys are adequately analysed and reports are produced. The 'under-five mortality rate', 'immunization rate', and 'HIV prevalence' was generally known among health-focused policy/decision makers.

6.6.3   Planning and priority

Planning and priority setting was found to be adequate and the overall score was 71%. All indicators in the national core indicator set have relevant targets. It was also observed that health information (risk factors, systems, status) was being used in different planning frameworks and in the planning process e.g. during the development of the National Development Plan 2006 – 2010; National Health Strategic Plan 2006 – 2010; Human Resources for Health Strategic Plan 2006 – 2010; the rolling 3-year term Medium Term Expenditure Framework, and MoH Annual Action Plans.

6.6.4   Resource Allocation

HIS information was to some extent used to set national resource allocations and to advocate for geographical equity in the allocation of resources. For example, a needs based resource allocation formula for the districts was developed in 2003 and applied in 2004. Various information sources including LCMS data, ZDHS, census and HMIS data were used in the development of the formula. In addition, the disease burden, poor access to services, insufficient budgetary allocation to the health sector have been clearly documented.

However, though there is a needs based resource allocation formula for distributing resources from the centre to the districts, there is no formula within the districts and catchment populations/crude guidelines are used in the allocation of resources to the various health facilities within the districts.   The implication is that equity and increased resources to disadvantaged groups and communities is not sufficiently addressed in Zambia.

6.6.5   Implementation / Action

Overall, the use of HIS information for implementation/action was found to be was adequate. This implies that care providers at all levels adequately used health information for local service delivery management, monitoring and evaluation. However, the use of information on health risk factors was not tailored to each vulnerable group.

7.0   CONCLUSION

In concluding the assessment, we had a review session where all the internal and external factors enabling/influencing the smooth operation of the HIS were presented and further analysed. The details of this analysis was in form of a SWOT analysis and emerging issues/policy recommendations are presented below.

Strengths
- There is a functional M&E Unit that coordinates HIS activities.
- There is high demand for information from senior managers, policy makers, donors, NGOs and other key players in the Zambian health sector.
- There is relatively good usage of information from the HIS for planning, budgeting and resource allocation at all levels.
- There is basic ICT infrastructure in all districts that facilitates the transmission and feedback of data from one level to the other.
- Reporting of information is done frequently and on time.
- There is a well defined system of data collection and transmission from the facility up to national level.
- A well defined national core indicator set exists and is used by almost all data sources.
- An up to date public health facility listing with GIS mapping exists.
- Information from the surveys conducted by CSO is regularly used.
- Surveys follow international standards for confidentiality and adhere to ethics.
- Regular dissemination of information through reports to stakeholders.
- There is an IDSR system that compliments the HMIS on routine data.

Weaknesses
- Private health facility reporting to the HIS is poor.
- Lack of a training policy for health information officers at all levels. There is no designated long term training in health information available in the country.
- Lack of HIS strategic plan.
- No data warehouse for all HIS data sources.
- Lack of maintenance of ICT equipment.
- Level 2 and 3 hospital reporting is poor and not integrated into main HMIS.
- Inadequate disaggregation of data by gender, socio-economic status and geographical conditions for routine data through the HMIS.
- Poor coverage and use of information from vital registration.
- Shortages of paper based systems at facility level.

Opportunities
- Revision of the HMIS to improve integration of vertical programmes, administrative and management systems.

- Capacity building of health information officers, epidemiologists and statisticians through short and long term national and international courses.
- Inclusion of the information officer cadre in the new MoH establishment structure.
- Improved ICT infrastructure and maintenance support at district level.
- Development of a national and sub-national web based data warehouse and repository.
- Improved advocacy of vital registration.
- Use of donor funds to improve patient record management.

Threats
- High staff turnover rate i.e. DHIOs, DMS, Statistical Officers, Demographers, Epidemiologists, ICT.
- Powerful donor driven vertical programmes which have their own reporting needs and systems.

8.0   RECOMMENDATIONS

Some of the key recommendations that singularly, and collectively, could make a major difference in the operation of the HIS in Zambia are presented below.

- Improved advocacy of HIS and its importance.
- Advocate for stakeholder support in the development and implementation of a HIS strategic plan
- Conduct an assessment of the extent of vital registration coverage in the country.
- Decentralisation of vital registration system
- Increase sensitization coverage on the importance of vital registration.
- Integrate vital registration with other data sources.
- Development of a training policy and curriculum for health information cadre.
- Training of health information officers in statistics and data analysis at all levels.
- Incorporate health information training in the curricula of health workers
- Support the development of a web based national data warehouse.
- Strengthen feedback mechanisms from one level to the other.
- Procurement and maintenance of ICT equipment at all levels.
- Improvement in data and logistics management.
- Improved intranet system to enhance electronic reporting at all levels.
- Improved publication of HIS information through graphs, maps and reports.

REFERENCES

Central Board of Health (2003). *Health Institutions in Zambia: A listing of Health Facilities according to level and location for 2002.* Lusaka: Central Board of Health.

Central Statistical Office (1993). *Zambia Demographic and Health Survey 1992.* Retrieved from www.zamstats.gov.zm

Central Statistical Office, Ministry of Health & Marco International Inc (1997). *Zambia Demographic and Health Survey 1996.* Calverton, Maryland: Central Statistical Office and Marco International Inc.

Central Statistical Office (2001). *2000 Census of Population and Housing.* Central Statistical Office: Lusaka – Zambia.

Central Statistical Office (2002). *Zambia Demographic & Health Survey 2001/2002.* Lusaka: Government Printers

Central Statistical Office (2004). *Living Conditions and Monitoring Survey Report III of 2002/2003.* Lusaka: Government Printers

Health Matrix Network (2006). *Strengthening Country Health information Systems: Assessment and Monitoring Tool version 1.97.* www.healthmetricsnetwork.org

Ministry of Health (1992). *National Health Policies and Strategies.* Lusaka: Ministry of Health, Zambia

Ministry of Health (1992). *National Health Policies and Strategies.* Lusaka: Ministry of Health, Zambia

Ministry of Health (1997a). *Independent Review of the Zambian Health Reforms: Volume 1 – Main Report.* Lusaka: Ministry of Health, Zambia

Ministry of Health (1997b). *Independent Review of the Zambian Health Reforms: Volume 2 – Technical Reports.* Lusaka: Ministry of Health, Zambia

Ministry of Health (2000a). *Joint Identification & Formulation Mission: A proposed Health Sector-support Investment Programme (2001 – 2005) Volumes 1 and 2.* Unpublished

Ministry of Health (2000b). *National Health Strategic Plan 2001 – 2005.* Lusaka: Ministry of Health, Zambia

Ministry of Health (2001). *Joint Health (pre) Appraisal Report.* Lusaka: Ministry of Health, Zambia.

Ministry of Health (2002b). *Zambia National Health Accounts 1995 - 1998*. Lusaka: Ministry of Health, Zambia

Ministry of Health (2004a). *Mid Term Review of the National Health Strategic Plan 2001 – 2005.* Lusaka: Ministry of Health, Zambia

Ministry of Health (2004b). *Institutional and Organisational Appraisal*. Lusaka: Ministry of Health, Zambia. Unpublished

Ministry of Health (2004c). *Performance Audit Report of the National Health Strategic Plan 2001 – 2005*. Lusaka: Ministry of Health, Zambia. Unpublished

Ministry of Health (2005a). *Draft National Health Care Financing Policy*. Lusaka: Ministry of Health. Unpublished

Ministry of Health (2005b). *National Health Strategic Plan 2006 – 2010*. Lusaka: Ministry of Health, Zambia

Ministry of Health (2005c). *Human Resources for Health Strategic Plan 2006 – 2010*. Lusaka: Ministry of Health, Zambia