

Health Information Systems in Ethiopia

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Abstract

Health Information Systems (HIS) is potentially very important for the development of the health sector in Ethiopia. In spite of some efforts to make the health care system integrated with information systems, it continues to be not well-developed in the nation's health sector. This paper tries to show the present condition of HIS in Ethiopia based on a review of information from existing sources. Different searching strategies were used to gather information on the concept of HIS development in Ethiopia from electronic journals, thesis papers, databases, internet, conference proceedings, Government publications, reports, statistics and books. Then the information gathered was thoroughly reviewed to summarize the level of development of HIS in the nation and synthesis a conclusion. The aim of this paper is to investigate information and make analysis to determine the current status of HIS in this country. Finally it enables readers to identify many questions that have not been answered yet and find research agenda to be addressed in the future. This research concludes that HIS in Ethiopia is poorly developed.

Keywords

Health informatics in Ethiopia, biomedical informatics in Ethiopia, medical informatics in Ethiopia.

1. INTRODUCTION

Ethiopia has a poor health status in relation to other low-income countries, even within Sub-Saharan Africa[1]. The most serious global health problems are in poorer countries, and good health information is vital in tackling these problems. Effective HIS offer government and health department officials a clearer understanding of the effects of their policies on the health of their people[2].

Health information systems in most developing countries are woefully inadequate to provide the needed information support[3]. There is a need by the health sector of developing countries to use the limited resource effectively in order to provide an efficient and equitable health service to the communities. This then requires sound management that is based on information, which is crucial at each level of the health service management[4]. Correct and up-to-date information is critical, not only for the provision of high-quality clinical care, but also for continuing health care, maintaining health care at an optimal level, clinical and health service research, and planning and management of health systems[5].

Health information systems refer to any system that captures, stores, manages or transmits information related to the health of individuals or the activities of organizations that work within the health sector. Overall, a well-functioning HIS is an integrated effort to collect, process, report and use health information and knowledge to influence policy and decision-making, program action, individual and public health outcomes, and research. Sound decision-making at all levels of a health system requires reliable health statistics that are disaggregated by sex, age and socioeconomic characteristics[6].

Health information can be the aggregate information about all patients that have attended or been admitted to a hospital, or attended a health center, outlying clinic or a community immunization or health screening program[5]. Whether we collect data on paper or in a computer, the data should be organized in such a way that we can understand and retrieve them when needed [7]. A country's HIS is made up of all the data and records about the population's health. The sources of data include civil and vital registration (recording births, deaths and causes of death), censuses and surveys, individual medical records, service records and financial and resource tracking information[2].

The objective of this paper is to review previous researches related to HIS and identify the level of development of the field in Ethiopia so that readers would easily see the gap for their future researches. An extensive systematic review of literature is the first thing that a novice researcher should begin with to acquire the knowledge and skills for conducting a meaningful research. In addition, in writing this paper, I got the opportunity to find a research problem for my master thesis which will be conducted in the area of HIS next year.

2. METHODS

To determine the current state of HIS I conducted an extensive review of literature. The first phase of the review was to identify relevant resource materials. Different searching techniques were used to obtain those materials related to HIS development in Ethiopia and sub-Saharan Africa from electronic journals, thesis papers, databases, internet, conference proceedings, Government publications, reports, statistics and books. The keywords used for searching were health informatics, health information systems, public health, medical informatics and biomedical informatics in Ethiopia, and sub-Saharan Africa. In the next phase of the review the selected resource materials were thoroughly analyzed to summarize the present condition of HIS in the country.

The review was done based on the Health Metrics Network (HMN) Framework division of the components and standards of HIS made by World Health Organization (WHO) in 2008[8].

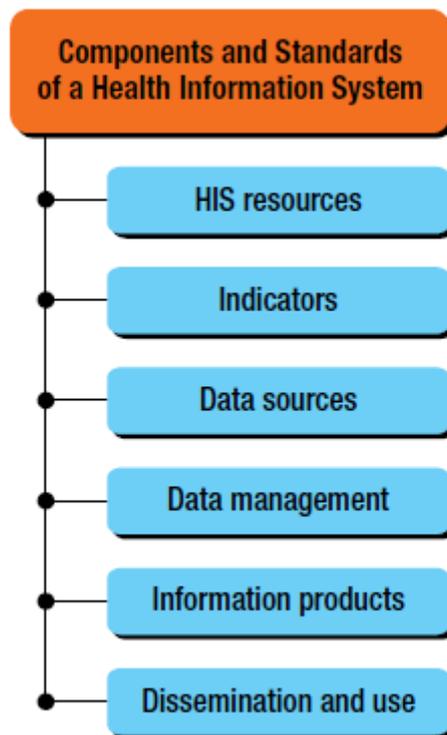


Figure1. The HMN Framework[8]

3. RESULTS

A national health information system assessment was carried out in 2008 using the Health Metrics Network framework and tools and this was updated and validated in 2011 as a step towards developing a national health information system strategic plan. According to the validated assessment results, among the six components of HIS, four components scored low, and the remaining two scored adequate. Data management scored as “not functional” (13%), and three components, HIS resources (42%), dissemination and use (48%) and data sources (52%) were found to be present but not adequate. Indicators (83%) and information products (73%) were considered adequate[9].

Table1. Summary assessment scores of HIS in Ethiopia, Sept 2011[9].

Component	Percent score	Description of Result
Total for the Six Components		
Data Management	13%	Not functional
Resources	42%	Present, but not adequate
Data sources	52%	Present, but not adequate
Indicator	83%	Adequate
Information Products	73%	Adequate
Dissemination & Use	48%	present, but not adequate
Dissemination and Use		
Implementation/action	56%	Present, but not adequate
Analysis and use	56%	Present, but not adequate
planning and priority setting	56	Present, but not adequate
Resource allocation	42%	present, but not adequate
policy and advocacy	33%	not adequate
Data Sources		
Vital statistics	18%	Not Functional
Health & Disease Records	53%	present, but not adequate
Administrative Records	52%	present, but not adequate
Health Service Records	61%	Adequate
Census	81%	Highly Adequate
population-based surveys	85%	Highly Adequate
HIS Resources		
HIS Infrastructure	56%	Present, but not adequate
HIS institutions Human ad finance)	41%	Present, but not adequate
Policy guidelines and planning	33%	Not adequate
Quality of information products by type of indicators		
Risk Factors	48%	Present, but not adequate
Mortality	64%	Adequate
Health systems	64%	Adequate
Health status	73%	Adequate
Morbidity	89%	Highly adequate

3.1. Data Management

Health Management Information System (HMIS) was established to “support informed strategic decision-making by providing quality data that help managers and health workers plan and manage the health service system.” As of 2008, a comprehensive electronic HMIS has been developed in conjunction with doctors associated with Tulane University and is now being deployed to health facilities in several regions of the country[10].

During the F.Y. 2011/12, to ensure timely and reliable data, HMIS has been strengthened. Based on that, a system has been practical in 92 percent of the hospitals and 78 percent of the health centers. In order to initiate rural Family Folders (FF) in all Health posts, guideline on rural FF was finalized. Family Folders adequate for 7.1 million rural families have been distributed and it was possible to have FF for 3.6 million (33.3 percent) rural families. Regarding urban FF, the design was finalized and piloting is underway in cities utilizing the close service of urban Health Extension Workers[11].

With respect to data management, assessments indicated that the situation of data management in general was considered “not functional” with very low score (13%). Central Statistical Agency (CSA) has standard procedures for data management and data warehouse for different demographic and socio-economic surveys that were conducted so far; but other institutions have no complete national data standards. CSA has procedure and guideline to collect, compile, store and exchange data & information at various levels for its own use but this had not been applied widely in the national HIS. Also CSA has data quality assurance mechanisms at various levels although it is not widely used covering comprehensive HIS. FMOH and sub national units lack integrated data ware house. Although the Ministry of ICT has prepared data management tools, there is no standard definition (Meta data dictionary) and data warehouse at national and sub-national level in the country[9].

3.2. Dissemination and Use

Available information needs to be timely disseminated and used for strategic decision making at all levels of the health system. Otherwise its availability becomes meaningless and useless. Dissemination and use component was assessed in terms of analysis and use of information, for policy and advocacy, planning and priority setting, resource allocation, implementation and action[9]. Through widespread dissemination and use of information products, the HIS provides direct benefit to all those who participate in it, providing an ongoing incentive for users to continue to strengthen the system[12].

Assessments showed that all sub categories under dissemination and use are present, but not adequate. Dissemination and use of information for resource allocation, and advocacy, performance monitoring and feedback mechanism is weak[9].

3.3. Resources

Networks (WAN and LAN), computers, internet access, databases and transport facilities are required to ensure data quality, to enhance feedback, information use and greatly facilitate the

ability of health information systems to produce timely, relevant and high quality information. The HIS assessment finding showed that computer availability is adequate and availability of basic communication infrastructure is highly adequate. Lack of integrated ICT infrastructures for HIS, limited use of available computers for health information purpose within the health sector, and limited access to internet at sub national level is noted. There is no strong support system for Information Communication Technology (ICT) equipment maintenance[9].

There is shortage of skilled human resource for HIS, the professional mix is poor and the attrition rate is very high in the health sector. In general the human resources capacity in core health information sciences to meet health information needs is limited[9].

Health care informatics has been identified as a critical area in need of extensive improvement. In June 2008, the FMOH began a large, nation-wide development initiative to reform the Ethiopian HMIS. Health care informatics development is also occurring in the area of telemedicine, including teleradiology. Ethiopia's Black Lion Hospital in Addis Ababa was one of the initial test sites for development of the telemedicine component of the Pan-African e-network, a joint project between India and the African Union to provide telemedicine and teleradiology services to over 50 African nations. The Pan-African e-network is an integrated satellite, fiber optics, and wireless network[13].

In 2011 the Health Ministry organized an eHealth workshop in order to begin developing appropriate health informatics standards and an architectural framework for interoperability and scalability of the various eHealth initiatives in the country. The "WoredaNet", the e-government communication backbone developed by the Ethiopian Telecommunication Corporation, promises to be a major enabler for rapid ICT development in the country[10].

3.4. Data Sources

The country has had a national e-Government policy since 2009[10]. The Federal Ministry of Health (FMOH) has implemented the Ethiopian HMIS while the CSA, a division of the Ethiopian government, manages population-based health information sources, i.e. censuses, ad hoc surveys, and registering vital events[10].

Concerning electronic health record, lack of coordination and standardization among various efforts, and lack of clear long term plan to move the whole system is a major concern[9]. More recently, Ethiopia has seen a significant deployment of the SmartCare system used in Zambia. Over 100 clinics and hospitals in the Dire Dawa region, covering the entire area, have successfully deployed this system for building and maintaining electronic medical records, which will improve both the quality of health information as well as patient care[14].

Computerized applications for healthcare include: SMARTCARE Ethiopia – an electronic health record system that supports longitudinal recordkeeping for a clinical care, especially for HIV/AIDS treatment, TB care, VCT, and antenatal care. The system is being rolled out nationally and provides clinical decision support and data portability via the use of smart cards [10]. SmartCare's most attractive features include the ability of SmartCare to personalize Patient's medical record by using SmartCards. SmartCards are pocket/credit card sized plastic cards embedded with an electronic memory chip capable of storing Patient's information.

Furthermore, SmartCards are used as an ID for a patient so that it will be easier to filter and retrieve his/her record and history during the follow-up sessions or visiting different points of services like reception, laboratory, pharmacy and so on[15].

Ethiopia had a health information system in which morbidity and mortality statistics could be captured and used at national level. As the previous system was tedious and required so many variables to be collected, with the new reform of Business Process Re-engineering (BPR) the health management information system has been reformed with a big reduction in data collection tools and limited variables at regional and national levels. One of the strategic changes made is standardization with one data source, one channel and one reporting system, as opposed to the previous fragmented vertical system for different health programs. The new design is currently in its pilot implementation phase. At various administrative levels – including national, regional, *woreda* and health facility levels – there are clerks who compile morbidity and mortality statistics. Each year a health indicator is produced at national level, and regions also produce their own annual performance monitoring reports. At FMOH level the system is computerized for data clerks and managers, but this is not the case in all regions[16].

The leading data collection methods are: Health and Disease Records (including disease surveillance systems) Census, Vital Statistics, Population-based Surveys, Health Service Records, and Administrative Records. In general data sources were assessed to be present but not adequate with a score of 52%[9]. Since the latest international statistical classification of diseases and related health problems (ICD) is not in use, it is difficult to standardize recording and reporting [9].

3.5. Indicators

Indicators are a set of measures that show changes in the country's health profile. Indicators measure determinants of health, health system, and health status[12]. As part of the HMIS reform a total of 108 core indicators have been identified for use in monitoring and evaluation of the HSDP. These were identified through discussions and consultations with stakeholders and cover determinants of health, health system and health status. However; early reviews indicate that some essential indicators for tracking key health programs were not covered in the reformed HMIS, but it is agreed to implement the system nationwide and address these limitations after a comprehensive evaluation [9]. The national core indicators reflective of health-related UN Millennium Development Goals indicators are: risk factors, mortality, health systems, health status and morbidity[17].

In this regard it was found from assessments that this component of HIS is adequate with a total score of 83%[9]. With the exception of indicators related to risk factors, all were adequate or highly adequate[17].

3.6. Information Products

Lack of timeliness and completeness of HIS reporting remains a weakness, and such delays contribute to the failure (at all levels) to use data as the basis for informed decision-making in

health care planning and management. Recognizing the weaknesses of existing routine paper-based system, there have been repeated efforts to reform HMIS in the country[18].

Assessment of information products showed that data quality in general is adequate (72%). Specifically quality of risk factor indicators was 67%, health status 74%, health systems indicators 72% all of them adequate, while among health status indicators mortality indicators (67%), is adequate and morbidity indicators (86%) is highly adequate[9]. However, information quality and use remain weak at the peripheral levels of woreda[19].

4. Conclusion

In this research I reviewed a large amount of existing studies related to HIS in Ethiopia and summarized as it was shown in the previous section. The paper explained the current status of HIS in the country with respect to the six components suggested by HMN. Readers can easily find out that researchers should give more focus to HIS in Ethiopia.

Results confirmed that indicators and information products are considered adequate but data management is very poor. Health information system resources, dissemination and use, as well as data sources coverage, are also inadequate. The capacity of institutions to generate, analyze, disseminate and use health information differs[20]. Hence this literature review revealed that the overall HIS in Ethiopia is poorly developed. This is primarily because of lack of extensive researches in the field. In conclusion I suggest more researches to be done on HIS in this country by prioritizing the components which are highly affected. In this way it is possible for individuals, organizations and other stakeholders to contribute to the development of HIS in this country.

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