Information support for health management in regional Sri Lanka: health managers' perspectives

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Abstract

Good management, supported by accurate, timely and reliable health information, is vital for increasing the effectiveness of Health Information Systems (HIS). When it comes to managing the under-resourced health systems of developing countries, information-based decision making is particularly important. This paper reports findings of a self-report survey that investigated perceptions of local health managers (HMs) of their own regional HIS in Sri Lanka. Data were collected through a validated, pre-tested postal questionnaire, and distributed among a selected group of HMs to elicit their perceptions of the current HIS in relation to information generation, acquisition and use, required reforms to the information system and application of information and communication technology (ICT). Results based on descriptive statistics indicated that the regional HIS was poorly organised and in need of reform; that management support for the system was unsatisfactory in terms of relevance, accuracy, timeliness and accessibility; that political pressure and community and donor requests took precedence over vital health information when management decisions were made; and use of ICT was unsatisfactory. HIS strengths included user-friendly paper formats, a centralised planning system and an efficient disease notification system; weaknesses were lack of comprehensiveness, inaccuracy, and lack of a feedback system. Responses of participants indicated that HIS would be improved by adopting an internationally accepted framework and introducing ICT applications. Perceived barriers to such improvements were high initial cost of educating staff to improve computer literacy, introduction of ICTs, and HIS restructure. We concluded that the regional HIS of Central Province, Sri Lanka had failed to provide much-needed information support to HMs. These findings are consistent with similar research in other developing countries and reinforce the need for further research to verify causes of poor performance and to design strategic reforms to improve HIS in regional Sri Lanka.

Keywords:

Note: Throughout this paper the abbreviation HIS refers to "Health Information System" although it also frequently stands for "Health Information Service" in other publications.

Introduction

Health Information Systems (HIS) play a vital role in the effective management of health services at all levels of the healthcare system. A report by the World Health Organization (WHO) (1987) highlighted the critical role that HIS play in managing health services: 'Of the major obstacles to effective management, information support is the one most frequently cited' (Sauerborn & Lippeveld 2000: 1).

The role of Health Information Systems

Management levels of healthcare organisations include patient/client management, health unit management and health system management (Lippeveld 2000). An adequate, timely and reliable HIS is an important support tool for decision makers at all levels of management. However, for health information to play an influential role in management processes, it has to be used by decision makers at all management levels.

Information has been defined as a 'meaningful collection of facts and data', while a 'system' is described as 'any collection of components that work together to achieve common objectives' (Sauerborn & Lippeveld 2000: 2). Accordingly, HIS can be defined as 'a set of components and procedures organised with the objective of generating information that will improve healthcare management decisions at all levels of the health system' (Sauerborn & Lippeveld 2000: 3). HIS integrates and coordinates data collection, data processing, reporting, and use of information. As such, it can improve health services management through optimal information support that assists managers to improve their effectiveness in detecting problems, defining priorities, identifying innovative solutions and allocating resources.

Access to reliable information about health needs, service delivery and the use of resources can improve efficiency and effectiveness of a healthcare organisation in several ways (Cibulskis & Hiawalyer 2002). It can: (a) assist managers to align patient needs with the health system resources (planning), and verify their plans are progressing satisfactorily (monitoring); (b) be used to improve the accountability within a healthcare organisation; (c) assist in marketing health programs to ensure public support and secure funding support from relevant agencies and donors; and (d) assist managers to evaluate the effectiveness of health programs and interventions that lead to greater efficiency and effectiveness in service delivery process.

Users of health information include health managers (HMs) at national, regional, district and institutional levels, researchers and evaluators, legislative and policy analysts, non-governmental organisations, consumer organisations, advocacy groups, private sector health providers, insurers, journalists, donors, international agencies, and individuals. Internationally, health information is used to detect and control the consequences of epidemics, results-based management of development assistance programs, and advocacy for increased financing of health.

HIS in developing countries

Although setting priorities for health planning and interventions is an acutely difficult exercise in resource-constrained developing countries, data collection and management of health information is of mutual interest to both developing and industrialised nations. Recent transnational trends that have enhanced international pressure to deliver better health information include global epidemics (e.g. Severe Acute Respiratory Syndrome (SARS), Avian Flu, and Swine Flu), tracking progress towards the Millennium Development Goals and increased demand for performance measurers from donors such as Global Fund and Global Alliance for Vaccination and Immunisation (GAVI). What has to be understood is that the accuracy and value of any information reported by a given country to national and international bodies will depend on the perceived value of that information in the country's regional and peripheral settings.

In contrast with more advanced countries with well-developed HIS to inform planning and delivery of health services, many less-developed countries have no effective HIS (Azubuike & Ehiri 1999). As a consequence, planning and implementation of health programs and interventions are often conducted with insufficient information, on the basis of sentiments expressed by pressure groups or 'guesstimates' of HMs (Lippeveld 2000). This type of situation can contribute to inequity, inefficiency and waste in the provision of healthcare services and can have far-reaching consequences for these HIS, particularly in the areas of primary health care and public health services, which impacts directly on needs assessment, program planning and monitoring of disease trends (Azubuike & Ehiri 1999).

While HIS reform is fast becoming a priority in developed countries, it has not received the attention it deserves in health system management in developing countries (Stansfield et al. 2006). For example, the rate of organisational change and HIS reforms,

if any, have not been matched with the recent advances and developments of ICT. Practical barriers to the HIS reforms in low-income countries include inadequate data collection systems, resource constraints, lack of incentives to collect health information and inadequately trained personnel (Chandrasekhar & Ghosh 2001; Idowu, Adagunodo & Acedoyin 2006).

There is a dearth of empirical data on the exact situation of information management in the HIS of low-income countries, which is more apparent in countries in the southeast Asian region. The scanty empirical information that is available in the literature is focused mainly on the regions of sub-Saharan Africa and the western Pacific region (e.g. Cibulskis & Hiawalyer 2002; Kimaro & Nhampossa 2004; Mutemwa 2006). It should also be noted that we lack an understanding of how HMs of a particular health system perceive the success or failure of their HIS in terms of information support for their routine and strategic management tasks. It is critical to improve our understanding of the ideas, concerns and expectations of HMs in resource-poor developing countries in relation to their own HIS. Such understanding could provide insight into not only the subjective knowledge of HMs and their information utilisation patterns and training needs, but also into agreeable future reform measures.

Objective of the research

The aim of this research was to investigate these key issues in a regional HIS of a developing country. We report findings of a survey conducted among a selected group of HMs in Central Province, Sri Lanka. Success or failure of HIS, and particularly the information support for health management, has not been systematically studied in Sri Lanka. Our main objective of this region-wide health survey was to investigate the availability of information support for public sector healthcare management. We hypothesised that HMs of the studied health region do not receive adequate information support for their management tasks to be carried out effectively. Supplementary objectives of the study were to investigate the ideas, concerns and expectations of these HMs in terms of potential HIS reforms and applications of ICTs in the management of health information.

Method

The research setting

The study focused on a regional HIS in Sri Lanka, a developing country situated in southeast Asia. Sri Lanka has a population of about 20 million, according to the last census conducted in 2000, with nine administrative provinces. Thus, HIS are decentralised accordingly. We purposefully selected the HIS of Central Province for our study for two reasons: (a) one of the researchers was familiar with the administrative and geographical settings of the Province, making it convenient to carry out the study; and (b) Central Province is representative of most of the other health regions of the country.

The Sri Lankan Health Ministry runs the national HIS with its own directorate. The decentralised health systems of the provinces have their own HIS, which are basically organised into three steps: (a) First and most fundamental are the healthcare institutions of both the preventive and curative sector, which maintain a group of registers. These registers contain basic information related to inpatient care, outpatient care, epidemiological data, maternal and child health, financial data, human resources and logistics, including pharmaceuticals. Consolidated reports of each sector are then prepared manually and transferred, usually by post, to the next level at the district offices. (b) The second step consists of consolidation of data at the district level health administrative offices. These reports are transferred, again by postal means, to the relevant provincial health department and to the National Health Ministry. (c) Provincial health departments compile these data in their planning sections. The Information Unit at the National Ministry of Health and Epidemiology Unit also compiles data and issues statistical reports periodically.

Participants and sampling

In December 2009, 65 questionnaires were mailed out to a purposively selected group of HMs in Central Province, Sri Lanka. Central Province is one of nine regional health

systems in Sri Lanka; it is divided into three administrative districts. According to the latest census, Central Province had a population of 2.5 million in 2007 (Department of Health Services, Central Province, Sri Lanka 2007). There were 201 healthcare institutions of various categories, including hospitals, preventive care institutions and administrative offices. The health workforce at that time was approximately 6,500.

We identified all of the HMs scattered around the Province who were directly involved in routine and strategic planning of healthcare services within the studied region, and using a purposeful and judgemental sampling procedure, we selected and enrolled 65 of these HMs to participate in the study. We offered no incentives for completing the questionnaire. Participants were informed that participation was voluntary and that responses would be anonymous. Of the 65 questionnaires distributed, we received 33 completed questionnaires, giving a response rate of 55%.

Ethics approval for the study was obtained from the Research Ethics Committee of Queensland University of Technology, Australia, and the Department of Health of the Central Province, Sri Lanka.

Measures

The questionnaire comprised 14 key questions grouped into three main categories: (a) information generation and use; (b) possible reforms to overcome the deficiencies; and (c) application of ICT in health information management. Some questions were open ended. A participant information sheet was attached to the questionnaire, which required participants to express their informed consent before they participated in the study.

The objective of the questionnaire was to capture the perceptions of HMs regarding the existing HIS and its management support. The questionnaire was developed by reviewing current literature on HIS in developing countries (Hanmer 1999; Odhiambo-Otieno 2005a; Odhiambo-Otieno 2005b; Özkan, Baykal & Sincan 2006; Health Metrics Network 2008a; Health Metrics Network 2008b; Yusof et al. 2008). It was pre-tested and piloted for ease of completion, and modified accordingly. We used the postal survey method as this was considered most efficient in eliciting unidentified sensitive information (Sakes & Allsop 2007).[1]

Procedure and data analysis

Self-administered postal questionnaires were posted to participants and a non-response was declared after three reminders. Each reminder elicited about 10% of the response rate (included in the total response rate of 55%).

After receipt of the completed questionnaires, a coding frame was developed and operationalised. Data were then transferred to a database and aggregate data analysed. Responses to open-ended questions were manually collapsed in to categories. Statistical analysis was primarily of a descriptive nature.

Results

Descriptive statistics from this survey are presented as the percentage of respondents in relation to the questionnaire items. Results are described and organised according to the order of the main sections and sub-sections of the questionnaire. Table 1 summarises the characteristics of the participants and their key management tasks.

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1   A copy of the original questionnaire (in English) is available from the corresponding author, upon request.

Table I: Designations and key management tasks of the participants

DESIGNATION	KEY MANAGEMENT TASKS	NUMBER PARTICIPATED
Secretary to the Provincial Ministry of Health	Formulation of policies and supervision of management tasks	1
Senior Assistant Secretary	Formulation of health policies and supervision of management tasks	1
Provincial Director of Health Services	Overall supervision and decision making in planning and management tasks in the province	1
Regional Director of Health Services	Overall decision making and planning and management tasks at district levels	4
Consultant Community Physician	Planning and management of preventive healthcare services in the province	2
Medical Superintendents	Planning and management of services at secondary care hospitals	5
Medical Officer (Planning)	Identification of needs and prioritisation at the provincial and district levels	4
Regional Epidemiologist	Planning and management of preventive healthcare services at district level	3
Medical Officer (Maternal and Child health)	Planning and management of maternal and child health services at district level	4
Divisional Director of Health Services	Planning and management of healthcare services at divisional level	40
	Total	65

Information generation, acquisition and use

Of all respondents to the study, 84% indicated that the management support they received through the current HIS was either unsatisfactory or poor in terms of relevance, timeliness, accuracy, availability and accessibility. Ratings were consistent across all five criteria.

When asked to rate the importance of various types of data sources in making decisions related to health planning and management, community requests, political interests, and donor requests were the three most highly rated factors (Table 2 refers).

Table 2: Most influential factors affecting management decisions of regional health managers in Sri Lanka

TYPE OF DATA OR RESOURCES	PERCENTAGE OF RESPONDENTS ACCORDING TO THE RATE OF IMPORTANCE			
	NOT USED	PROVIDES MINOR SUPPORT	PROVIDES SIGNIFICANT SUPPORT	CRITICALLY IMPORTANT
Political interests		12%		88%
Community requests		6%		94%
Donor requests		17%		83%
Inpatient data		84%	8%	4%
Out patient data	6%	88%		
Clinic data	10%	90%		
Notifiable disease data	4%	96%		
Financial data	98%	2%		
Epidemiological data	10%	90%		
Demographic information	12%	88%		
Health indicators	98%	2%		
National Health policies	2%	44%		
Biomedical supplies and distribution data	5%	95%		

The majority of respondents (90%) agreed with the statement that 'national and regional HIS of Sri Lanka are poorly organised and need urgent reforms'; 21% expressed strong agreement to this statement while 10% of the respondents disagreed with it.

Application of ICT in health information management in the studied health region was considered unsatisfactory by most of the respondents. Table 3 shows the status of application of ICT in the provincial health system, as perceived by local health planners.

Table 3: Application of ICT in management of health information in regional Sri Lanka

COMPONENT OF THE HEALTH INFORMATION SYSTEM	PERCENTAGE OF RESPONDENTS DESCRIBING THE SITUATION				
	VERY GOOD	GOOD	SATISFACTORY	UNSATISFACTORY	POOR
Data collection				4%	96%
Data transmission				4%	96%
Data processing			48%	52%	
Data storage			17%	83%	
Information retrieval			16%	84%	

Tables 4 and 5 show the most prominent strengths and weaknesses of the regional HIS respectively, as perceived by the respondents.

Table 4: Strengths of the regional Health Information System as perceived by the health managers

STRENGTHS OF THE REGIONAL HEALTH INFORMATION SYSTEM	PERCENTAGE OF RESPONDENTS
User-friendly paper-based system	45%
Availability of a centralised planning system	45%
An efficient disease notification system	40%
Meaningful utilisation of some data	30%

Table 5: Weaknesses of the regional Health Information System as perceived by the health managers

WEAKNESSES OF THE REGIONAL HEALTH INFORMATION SYSTEM	PERCENTAGE OF RESPONDENTS
Lack of comprehensive coverage of the system	45%
Doubtful accuracy in data and information	45%
Delay or lack of feedback	40%
Records are often misplaced	40%
Minimal application of ICT capabilities	40%
Lack of a common database	38%
Non-utilisation of health information for management activities	35%
Lack of timeliness	35%
Low priority for HIS development	34%

In addition to the major weaknesses depicted in Table 5, repeated collection of the same data, inadequate time for data transmission, lack of a mechanism to check the accuracy of data, excessive number of forms, lack of mechanisms for monitoring and evaluation, lack of user friendliness and lack of motivation among staff members also were reported as existing weaknesses.

Reforms to the HIS

Of all respondents, 95% agreed with the statement that the existing HIS was in urgent need of significant reforms. The most popular reform measure selected by respondents

(40%) was the adoption of an internationally accepted framework. The other two types of reform that were of interest to respondents were: a complete overhaul of the system; and development of functional tools to address specific issues (See Table 6).

Table 6: Preferred types of reforms to the Health Information System as perceived by the health managers

PREFERRED TYPE OF REFORM	PERCENTAGE OF RESPONDENTS
Adoption of an internationally accepted framework	40%
Development of specific funtional tools with minor reforms to the existing system	25%
Complete overhaul of the system	20%

Application of ICT in health information management in the Province

In its broader sense, ICT is a technological domain that can be defined as 'the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications' (Longley & Shain 1986). Application of ICT is considered important in improving all aspects of health information management, including collection, transmission and analysis of data at the most fundamental level. It is also vital for improving the storage, retrieval and optimum utilisation of health information at the advanced level of health information management.

Of all respondents, 84% were found to be satisfactorily skilled in routine computer applications, as required by a health manager; 10% were regular users of computers in their routine health management tasks; a majority (62%) used computers only occasionally in their routine works; and some (18%) never use computers in their routine work.

All respondents agreed with the statement that ICT would improve health information management in their health region. However, the majority of respondents believed that the process of introduction of ICT might not be successful in their health region due to various reasons such as poor computer literacy among the staff (83%), administrative bureaucracies (87%), high initial cost (16%), and lack of a well-structured HIS in place (73%).

Discussion

The findings of this region-wide survey confirmed our hypothesis that information support for evidence-based health management was unavailable in the local health region of Central Province, Sri Lanka. Although these findings may appear to be intuitively deducible, our study is the first to demonstrate that routine HIS does not meet expectations of HMs of regional Sri Lanka. Furthermore, our study reflects a dramatic and widespread lack of evidence-based health planning and interventions in a regional health system of this under-resourced country. Although our study does not shed light on the reasons for absence of information based health management and planning, the failure of HIS could be considered at least partly responsible. Alarmingly, most of the HMs of our study did not use vital health information in planning health interventions and programs, which arguably demonstrates that the HIS of the studied health region did not meet its objectives, as perceived by the local HMs.

Contrary to our expectations and to the results of similar studies performed in developing countries (Cibulskis & Hiawalyer 2002; Gladwin, Dixon & Wilson 2003; Chaulagai et al. 2005; Kimaro & Nhampossa 2005; Idowu et al. 2006; Mutemwa 2006; Kimaro & Sahay 2007; Mofleh, Wanous & Strachan 2008), most of the HMs reported that they were satisfactorily skilled in routine computer applications as appropriate for a health manager. While this may be a subjective interpretation of their own skills, it could also indicate that there would be minimal practical impediments in motivating ICT-based reforms to HIS in future reform attempts.

Limitations of the study

Our study did have several limitations. First, although the questionnaire did undergo pilot testing, it had not been assessed for test-retest reliability, which limits the validity of the survey results. Second, response bias, lack of motivation to answer less interesting questions and inability to control question sequence might have impacted negatively on participants' producing more high-quality responses. Third, some important and relevant information about the HMs who participated in this study, such as their individual designations and descriptions, had to be withheld for ethical reasons, to ensure the anonymity of participants was preserved. This limits availability of specific information pertaining to various levels of management. Since the study was conducted in only one specific health region in one province of Sri Lanka, these findings may not be generalised to other regions. However, much of Sri Lanka is homogenous with respect to health administration and health information management and, therefore, the findings do give a fair idea about the information support for health management in other areas as well. There are also some inherent limitations of postal surveys (Sakes & Allsop 2007). Nevertheless, these limitations do not undermine the value of the overview provided by this survey and insights that can be drawn from the analyses of the survey data.

With the exception of the status of ICT skills among HMs, the major findings of this study are consistent with findings of similar studies carried out in developing countries, which have also reported a similar lack of information support for health management (Azubuike & Ehiri 1999; Kimaro & Nhampossa 2004; Odhiambo-Otieno 2005b; Dada 2006; Mutemwa 2006; Qazi & Ali 2009; Hotchkiss et al. 2010). Such findings and those of the present survey suggest that failure of HIS is a significant hindrance to the management of healthcare services of these countries and that further research and immediate intervention is required to rectify the situation. The situation is particularly devastating when one considers the unique features of double burden of diseases, demographic transition and stagnant or decreasing resources that are prevalent in these countries (Disease Control Priorities Project 2006). Although no conclusions on cause and effect can be drawn from our results, it could be reasonably argued that HIS failure is, in all likelihood, an adversely contributing factor to the management of healthcare services in the studied health region and possibly the entire Sri Lankan health system.

Conclusion

In conclusion, this self-reported, region-wide survey has answered our research question and strongly suggests that the routine HIS in the studied regional health system failed in providing much needed information support for health planning and management. Further studies with wide stakeholder involvement are required to elicit the causes of this failure and to propose strategic responses. This survey is a precursor to a more comprehensive qualitative study, which is in progress to achieve the above objectives.

It must be acknowledged that availability of good-quality information does not necessarily lead to good health management in developing countries. What is actually required is an evidence-based decision-making culture and practice. For this to happen, the HIS must be able to transform information into valid evidence. To achieve this difficult objective, significant capacity building and reform efforts are needed, supported by sound research.

Acknowledgement

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