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Health Management Information System (HMIS); Whose Data is it Anyway? Contextual Challenges

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Abstract

In 1997 the Ministry of Health instituted the national HMIS in response to global and national call for greater accountability and results-based management. The goal being to provide timely reliable health information that would inform decision making in the sector to aid provision of better health care services to the people of Uganda. However, there are already concerns about the functionality of the system characterized by late and inadequate reporting.

The purpose of this paper was to make a critical analysis of the contextual challenges to HMIS and propose a framework that would improve the collection of timely reliable data at all levels in the system.

After critical analysis of the existing literature, reports and presentation at various MOH workshops and review meeting, and interactive informal talks with some personnel at the Ministry, this paper asserts that failure to use HMIS data, poor culture of accountability, lack of incentives for performance, strategic planning and vertical programs-HIV/AIDS are the strategic contextual challenges to this menace.

Data utilization at all levels in the system will be the linchpin in realization of timely collection and reporting of data and to this end, a user-friendly system is at the core of any successful public health system when it will;

Assist hospital managers to align health system resources with the needs of service users

Link performance measurements to accountability

Monitor health-related activities to help assess what works and what doesn't

Contribute to organizational development

This paper proposes a framework that will see data utilization as the foundation for timely collection and reporting at all levels in the system. There will be organizational learning with the associated organizational development breeding ownership and sustained demand for data collection and reporting. Key in the implementation will be; leadership, change management, organizational embedding and capacity development.

Keywords: Provision; Critical analysis; Literature; Accountability; Strategic contextual challenges

Background

Over the last three decades there has been increased global and national demand for greater accountability and results-based management [1-3]. This demand has necessitated the need for designing of useful and useable monitoring and evaluation systems (M&E) that support programming and design of evidence based policies and work plans [4-6]. According to the Uganda National policy on Public sector on Monitoring and evaluation, M&E is recognized as one of the five pillars of results-based management [7].

Others being; strategic planning, operational planning and budgeting for results, public financial management, programme and project management [7]. The primary goal of M&E in Uganda is to improve the performance of the public sector through the strengthening of the operational, coordinated, and cost-effective production and use of objective information on implementation and results of national strategies, policies, programmes and projects [7].

Result-based M&E systems designed successfully are said to monitor and evaluate projects, programs and policies at all levels [8-10]. Information collected and analyzed at any phase of project cycle provides feedback that can better inform key decision-makers and other stakeholders. A functional M&E system should provide a continuous flow of information that is useful internally as a

management tool and externally as evidence to those who demand discernible impacts [11-13].

The Health Information Management System (HMIS) in Uganda

An HMIS is a database system in which "raw data" are stored and transformed into information, as a system is said to be composed of interrelating components that can be grouped into two entities [14-16]. At the first level, the process is to ensure the collection of data from lower levels to the central level that transforms data into information. The conceptual level concerns itself with analysis and feedback mechanisms aiding the transformation of data into knowledge to inform decision making [17]. The functionality of the HMIS varies from organization to organization but generally in the ministry of health it is used to collect routine data and information on patients, costs, performance of personnel, specific diseases, medical conditions, their management, use of medicines and other medical supplies [18]. Generally routine data collection provides most of the data used for M&E, making the HMIS and other reporting tools, a major component of the M&E system at the MOH. The tools exist in both electronic and manual to cater for the differences in technology built at various health facilities in the country [19]. At the health facilities there are a number of registers (specific diseases/conditions), client data cards that are supposedly filled on a daily basis and data compiled on a monthly basis into HMIS report forms either manually or electronically and send to the next reporting level in the health care system; mainly from health facility to the district health office and eventually to the MOH.

In Uganda, a health information system (HIS) was first designed in 1985 to capture and analyze morbidity data for selected communicable and non-communicable diseases and other services like immunization and family planning.

Information was collected in health facilities, summarized at district level and later forwarded to the ministry of health. In 1992, a review was commissioned after realization that vital management information on staffing levels, infrastructure, health facility management, medical equipment availability, drug and financial management were left out. Based on the findings of the review and modifications, a national wide HMIS was initiated in 1997. The core functions of the Ugandan HMIS are to establish and maintain a comprehensive of health and management information for planning, monitoring and evaluation of the health sector strategic plan. The major focus being improving and strengthening; Data collection and compilation of health events, timelessness, completeness and accuracy of reported data, analysis, interpretation and utilization for evidence based decision making and action, regular dissemination and feedback to all stake holders among others [20].

The 1997 model of the Uganda HMIS was based on a multitude of paper tools (reporting forms, registers, databases, and manuals), each containing a specific set of programme information. Health workers at lower levels were supposed to record and compile separately a number of forms. Due to the big number of forms and registers, health workers spent lots of time on tallying and summarizing the information. This labor intensive activity is said to have somehow affected the accuracy of reports and reporting itself at all levels of the system [21]. Thus in 2000-2001, a review of the HMIS data collection and reporting tool was conducted with the aim of integrating the major aspects of the health and management information. In July 2001, a national dissemination workshop to launch the revised HMIS tools was

organized [20]. The HMIS has of recent been revised to harmonize reporting systems and cater for emerging information needs of the MOH and other stakeholder in the areas of HIV/AIDS, TB and Malaria care programs [19,21].

However, findings of a study on the quality of Uganda's health facility data collected through the HMIS revealed that overall, the data quality in 2010/2011 was somewhat lower than in 2008/09; with only 71 of the 112 districts (63%) meeting the quality criteria [22]. The study shows that Completeness of district reporting is poor in 9% of districts and completeness of health facility reporting is problematic for one-third of the districts. Accuracy of reporting is only partly adequate, with 18% of the district reports zero or missing, 7% of the districts having extreme outliers, and 9% of the districts having major differences between the annual total and the sum of the monthly reports. District population projections for the denominators in 2010/2011 are estimated to be off by more than one-third for 22% of districts [22].

Similar observations on lack of timely reliable data have been noted in other studies and national HIV/AIDS coordination meetings [23]. In the MOH technical review meeting held in July, 2011, lack of reliable data due to failure by some health facilities and districts to report was highlighted as a major challenge of the M&E unit of the AIDS control Program (ACP). For example data from the national HIV counseling and testing (HCT) unit indicated that 49%, 33% and 53% of the districts in the country registered 100% reporting in 2008, 2009 and 2010 respectively. This observation cuts across all the programmatic areas of the ACP unit according to the M&E program officer. This raises a concern of whether planning at all levels in the system is informed by reliable up to information. Informal talks with MOH officials at the ACP program indicate that there is already fatigue at some facilities that even certain indicators in the tools are not reported on. For example during the ART adherence framework formulation workshop, it was observed that some indicator questions on the HIV care/ART card are never reported on or even filled by health workers.

This in itself raises a concern of the utilization and relevancy of data at the service delivery points. The Minister of state for primary health at the HIV/AIDS coordination meeting held 30th June-1st July, 2011 said despite achievements made in sector over time, the public perception of the sector is negative. He attributed this largely on the use of old un-updated data and lack of dissemination mechanisms. If this assertion is true then one would wonder whether planning and decision making including setting programmatic targets is informed by reliable data at the MOH. A number of factors including limited number of staff and skills, low motivation, combined with lack of incentives and tools have been pointed out by some scholars and actors to be responsible for this gloomy face [23,24]. While this could be true, this paper contends that this is just a tip of the iceberg. Thus, the goal of this paper was to attempt to make a critical analysis of the contextual challenges to HMIS to decipher the true face of this problem and thereafter propose a framework that would improve the collection of timely reliable data/information at all levels of the health care system.

Methods

This is a personal analytical opinion based on my personal observations and interaction with the M&E Unit of the ministry of health during my attachment as a fellow trainee in global health leadership in 2011. After a careful review of existing literature, presentations at workshops, reports and interactive informal talks with

some personnel at the AIDS control program (ACP), MOH that focused on characteristics of the HMIS (data collection processes, utilization at all levels), strength and weakness, we observed that inadequate number of personnel, in addition to limited financial and other material resources are some of the critical factors pointed to by many to be responsible for lack of reliable and timely data. However, below are the critical contextual challenges I consider antecedents to this menace.

Utilization of HMIS Data

In the health sector, HMIS is being more and more used to fulfill the often very demanding reporting requirements of higher institutional levels such as the District, Ministry of Health or donor; that one can conclude that the HMIS is basically keeping track of the main outputs in a health organization. This emphasis on reporting disconnects the lower (collecting) facilities from data as it's perceived to be a need of higher institutional levels. This translates into lack of ownership at the very collection level, the problem continues along the reporting chain. This observation was re-affirmed by the data officer at ACP unit, who said many times facilities are not even aware of their own data and that they are made aware during the support supervision visits. it is said that at times facilities refuse to acknowledge their own reports claiming that wrong data should have been submitted especially if the report reflects low or bad performance on certain programmatic indicators. This raises the concern of whether the reported data is reliable or just reported to fulfill the obligation. The other concern is whether data is analyzed, disseminated and utilized at the collection facility. It has been observed that HMIS can be used as an organizational development tool if data is transformed into information for organizational service delivery improvement. Organizations or facilities can only be motivated to continually collect and report reliable and timely data if they find it useful or learn from it to improve the performance of their own organization [25-27].

The general observation is that data utilization at all levels in the health care system is low except at some few centers (learning organizations) of excellence [28,29]. Some technical staff at ACP unit concurs with this observation that many times data has not be used, activities including planning seem to continue in a more or less predicted manner. This status quo is less likely going to create demand for commitment to HMIS related activities. HMIS should be seen as a major fundamental policy reform in the health sector that requires a new mind set, in particular the use of data.

Organizational aspects like vision, programmes, people, structure and procedures and organizational processes; thinking and learning, doing, being and relating all have implications on policy implementation [30-32]. People are likely to buy-in policy change if they think it positively impacts on their core business. For example do structures and procedures support the core business of the organization in terms of program planning, doing or being in terms of administration, structure modification. While the HMIS keeps track of the main outputs in the health sector using it solely for this purpose creates fatigue among those involved as little if any is seen between the process and the core business of the health facility. It's not therefore surprising that most health workers see themselves as care provider (their core business) and thus have no business in data collection. HMIS should be seen as an organizational tool with an objective of tracking outputs, relate them to inputs and thus monitor the effects of managerial decisions.

This paper argues that improving data utilization in the system including lower levels will require transformation of health facilities and the system into learning organizations, key in this aspiration will be change management. The use and learning will lead to alignment of health systems resources to the needs of service users, linkage of performance measurements to accountability, monitor health related activities to assess what works and what doesn't and contribute to organizational development (improved quality of service and visibility in the eyes of the public).

Learning, organizational development and ownership will generate demand for timely reliable data that will see commitment from the system at all levels in terms of resource (finance and human) allocation for HMIS related processes. Organizational learning can be encouraged through introduction of hospital journals where best practices and innovations at different hospitals in country are compiled on annual basis. Such an approach can provide not only an opportunity for hospital to learn from each other but also motivate hospitals to value collection of timely and reliable data. Hospitals in this case are the only role models for their counter parts.

Culture of Accountability

Understanding this problem in the total context of the country is imperative. It has been observed that the culture of accountability and evidence-based management is still relatively new and not yet well established and widespread in the public sector [4,33,34]. Observations indicate that several policy makers do not understand the value added by M&E tools to guide future policies, programs and budgets for better result [6]. This could also be true for the health sector. Despite the implementation of result based management initiatives and tools like the HMIS in Uganda, demand for accountability mostly focuses on monitoring information related to budget preparation, execution and reporting. There is still a culture of "consuming budgets" versus reaching results and performance is mostly measured in terms of activities and outputs rather than outcomes [4,35,36]. Planning and setting programs targets may not necessarily be based on evidence or reliable data; many at the MOH will tell you that the problem is not lack or absence of data but rather use of the available data/information. Furthermore budgets are allocated to health facilities in accordance to the national strategic plan, which at times doesn't reflect the situation on the ground in terms of data. There are situations where budget allocations are guided by politics rather than evidence in form of data.

Scholar like Duco and Resodihardjo have pointed out that institutional socialization may result into policy lock-in that leads to path-dependence, for example the culture of planning not based on reliable data itself is a barrier to organizational behavior of collecting and reporting timely reliable data [37]. A culture that raises the concern of whose data is it anyway? This context makes commitment to HMIS goals including data collection, human and financial resource allocation limited among key policy manager, program managers and staff at service delivery points.

This paper argues that the daunting challenge facing HMIS is not inadequate staff and limited finances as pointed out by many but failure by the system to use the available data. Collecting data that is not used in the system breeds fatigue among those involved in data collection and compilation. There is no evidence that availing the necessary staff with financial resources will necessarily improve collection and reporting of timely and reliable data. This hypothesis holds if we compare with NGOs and other centers of excellence, while

this paper is not trying to contend that NGOs are more effective and efficient than government, but rather because their survival in terms of funding depends on demonstration of evidence in terms of data/information to their funders, they have put in place structures to ensure that timely reliable data is available [38].

Thus it's not the inadequate staff but the value we attach to data. This paper thus recommends that the MOH should demonstrate to those engaged in data collection how data collected in the system has been used and mechanisms to disseminate data utilization. However, data utilization at the very source of generation should be the priority if the hunger to collect and report timely reliable data is to be sustained. Like any other policy change, a favorable environment is necessary for its success and this may call for other reforms in the sector for example financing.

Incentives for Performance Measurement

The HMIS operates in an environment where the incentive system of rewards and sanctions itself is non-functional. Some scholars have pointed out that the system has no "bite" as both institutions and individuals do not bear the positive or negative costs of their actions, results or lack of [6]. For example what happens if a facility doesn't report or report late? We observed that reporting or not seem not to affect the facilities. For example they will continue to receive their drugs, since even the drugs are supplied by another party, employees will continue getting their pay and probably institutional budgets, as the culture is preoccupation with activities. From this observation one would conclude that there seem to be no practical incentives for data collection, compilation and reporting at the facility level, given that planning and setting target can be done without necessarily using data.

Performance assessment has been implemented for staff with guidelines to be linked to a system of rewards and recognition [39]. There is lack of incentives for performance probably due to the fact the resources to offer incentives to adhere to results-oriented management and related integrated performance framework like HMIS are not available. In light of this reality (lack of resources to incentivize data collection and reporting in the health sector), data utilization through, documentation and sharing of individual hospital best practices and experiences, introduction of hospital journals, newsletters presents an opportunity to leverage on.

Such initiatives will create demand for timely and reliable data/information at the center of generation; more importantly such intervention will enable hospitals in country to share and learn from each other challenges, lessons, innovations and best practices. We ought to appreciate that these facilities are centers for innovations that many of us are unaware of. This paper asserts that such an approach will transform our health facilities into learning organization and it's the learning, documentation and sharing best practices with other hospitals that will provide the incentive for timely data collection, compilation and reporting.

Strategic Planning

Despite existence of strategic plans at national and lower levels like hospitals, many times they are not always based on a good diagnosis resulting from a solid analysis of baseline data and use of evaluation information from previous plans and interventions. Everybody seems to say there is lack of information or data while on the other side data lies unutilized sometimes. According to Idea international, 2010, some strategic plans are based on personal judgments and at times politics

with little or no attention to existing evidence [6]. Such scenarios don't provide an environment for commitment to HMIS and its related processes. This also furthers the argument that data utilization is the daunting challenge of HMIS. This paper asserts that only when organizations in the system see how data collected influences their organizational processes; thinking and learning, planning, managerial decisions and performance; that commitment to the HMIS will be achieved. It's hoped that when the above is realized more resources in terms of human and finances will be allocated for the same cause.

HIV/AIDS

While HIV/AIDS still poses one of the most formidable public health problems to the health care sector, the same is true for M&E and thus HMIS. The disease has not only led to enormous donor funds being pumped into system but also proliferation of numerous international, national and local NGOs, each implementing HIV/AID related interventions. The emergence of bilateral agencies like global fund and Bill-gates with specific interest in HIV, Malaria and TB has almost seen most new infrastructure development in health care in Uganda focus on these three diseases. Most of the HIV/AIDS interventions are implemented in form of projects with a lot of data/information demands most probably as donor requirement that a number of parallel reporting systems emerged [40,41].

One observes a number of detailed data collection tools including client registers and cards; for example the ART cards, Pre-ART and ART initiation register, ART dispensing log books and others each with a number of variables in areas of HIV/AIDS and TB and few, if any in other disease areas. For example it was noted during the chronic care model workshop that during the pre-implementation assessment, there were no registers and cards for other chronic condition like diabetes, hypertension and cancer at health facilities in the pilot district. Members concurred that this true for most health facilities in the country and that data/information on these conditions is therefore scanty.

This is probably not surprising as HIV/AIDS has over time fascinated donors that one observes a lot of projects and funds in this area and few if any other disease areas. Today if one visited and found a new tool like computer, microscope or even a table at a health facility, you would be surprised if you are told that it was procured or donated not through an HIV/AIDS project. The system has almost become synonymous with HIV/AIDS.

The fact that HIV/AIDS related interventions are implemented in form of individual projects has ultimately led to development of different registers and reporting tools; for example ART, HCT, PMTCT, each with its own data collection and reporting demands. Generally one would hypothesize that HIV/AIDS interventions have seen more data being demanded from health facilities than never before. This could probably be due to the very nature of their implementation; "project like" and also being implemented by various partners who must demonstrate to their funds their outputs. It's surprising that many are of the view that data collection in such a manner is straining the already constrained workforce in the sector. Also this paper doubts the sustainability of such an approach when mainstreamed the public sector.

While the new framework to integrate HIV/AIDS data into the national HMIS presents a new ray of hope, there is a need to recognize that unless culture of timely reporting is addressed, lack of data in form outputs may stiff efforts to mobilize resources from the donor

community; as such efforts to stamp out the epidemic may be undermined. Secondly most of the time different partners implement different HIV/AIDS interventions, presenting coordination challenge.

To the HMIS, the different HIV/AIDS interventions employ data tools with a number of variables, if integration means reducing the workload at the collection point, then the question is whether integration doesn't mean addition or if it means reduction then which variables must be lost without missing out important data for planning. Integrating the reporting mechanisms for HIV/AIDS service related indicators (ART, PMTCT, and HCT) may offer another alternative. There is need to balance data collection and reporting on HIV/AIDS and other health related diseases if system is to be responsive to the health care needs of all Ugandans.

This paper contends that understanding these contextual challenges; use of HMIS data, the culture of accountability, incentives for performance management, strategic planning and HIV/AIDS will be imperative in planning interventions to strengthen HMIS and M&E frameworks in the health care sector.

The Framework for Timely Collection and Reporting of Reliable Data

This paper proposes the framework below as a tool to create demand for timely collection and reporting of data at all levels in the health care system.
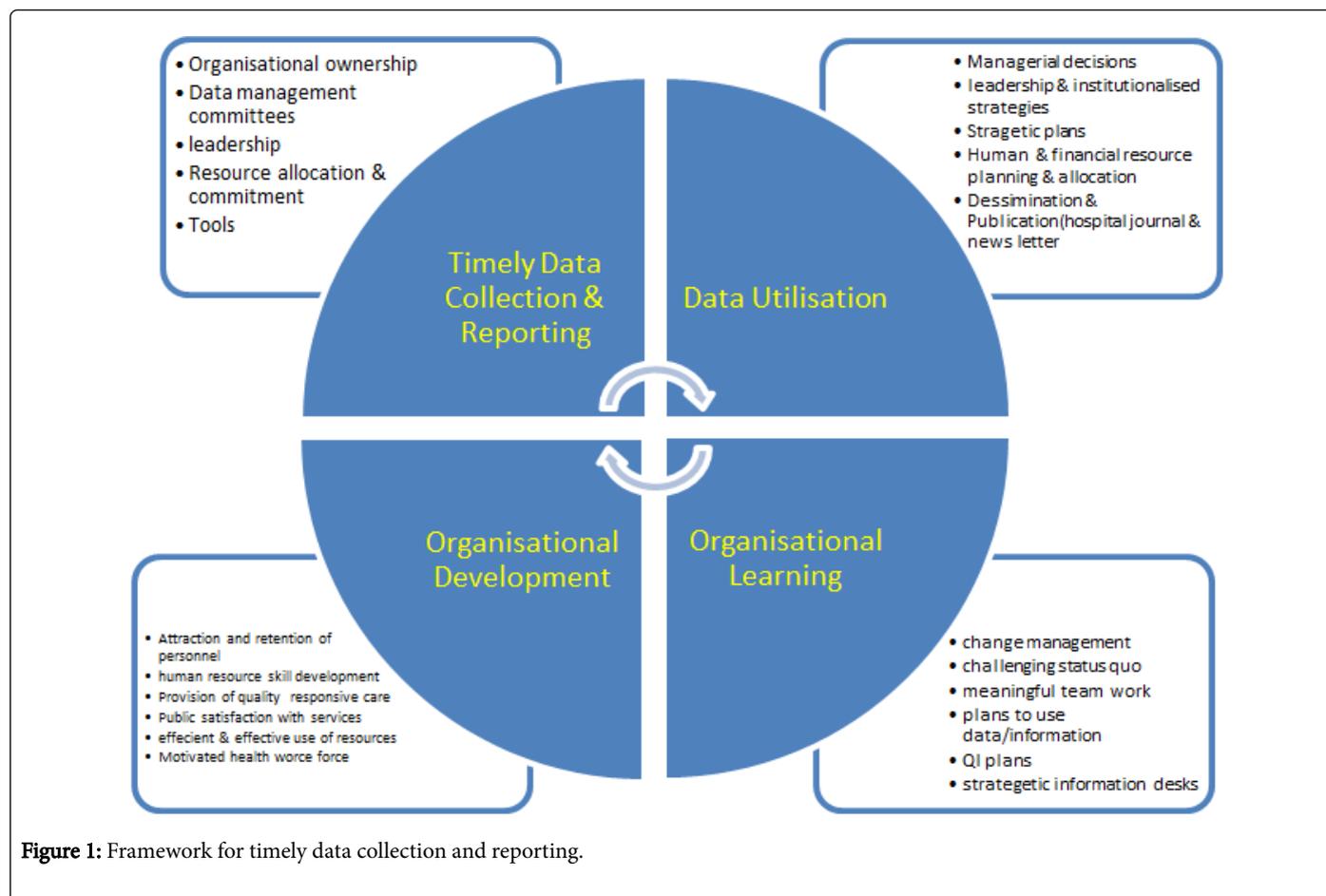

Figure 1: Framework for timely data collection and reporting.

According to this framework, data utilization at all levels of the system will be the key in generating momentum for timely collection and reporting of reliable data, more so at the collection points. Data/information must been seen to be the basis of managerial decisions including strategic planning, planning and allocation of resources, organizational and staff performance appraisal. Facilities may be encouraged and empowered to use data/information to mobilize own resources. Generally data/information must be seen to influence the dynamic processes of these facilities (thinking and learning, doing, being and relating). To this end therefore, there is need to incentivize the use of data at all levels of system. While transforming these institutions into learning organizations presents one opportunity, policy reforms may be necessary including financing, drug supply, Human resources and performance based contract employment.

Critical to realize the goal of data utilization will be leadership, Institutionalized strategies on how data generated at each level will be utilized should be designed.

Furthermore, data utilization will transform these institutions into learning organizations that will see them not only effectively plan, efficiently mobilize, allocate and utilize the resources available but also provide quality and responsive care to the Public. Learning that is linked to planning, resource allocation and use will generate and sustain demand for data collection, analysis and reporting.

To incentivize learning at health facilities we propose that documentation of best practices and innovations that utilize data generated be encouraged. To this end, we propose the introduction of hospital newsletters, journals and websites where possible. The

dissemination of such information will not only allow hospitals to learn from each other but also increase their public visibility; this could go a long way to fascinate young professionals. Critical to this however, will be strategic leadership, change management, organizational embedding and capacity development. To enhance the analysis and use of data/information, there may be need to upgrade the position of hospital records officers to strategic information officer with abilities to analyze and interpret data.

Data utilization with the associated organizational learning will lead to organizational development that will see these organizations become evidence-based in their routines. It's hypothesized that capacity development in data analysis and use, resource planning and use, attraction and retention of skilled human resource for health will accrue with resultant improvement in quality services to the public. The improved quality of services will improve public satisfaction.

Data utilization combined organization learning and organizational development will lead to data/information ownership that will create and sustain demand for timely collection of reliable data. Critical to timely collection of reliable data is data ownership and use. To this end therefore, there will be a need to adopt user friendly tools, organizational embedding and capacity development.

In a nutshell, according to this framework, data utilization at all levels in the health care system will be the linchpin in realization of timely collection and reporting of data. The collected data must be seen to influence the processes that make an organization dynamic (thinking and learning, doing, being and relating) to all stakeholders in the system. Data utilized in this way will see commitment in terms of financial, human and other material resources from the system. However, it may also be very imperative to ascertain from the facilities themselves how they can utilize data.

Limitations

This was a desk review with some informal interviews with some MOH personnel. The period of stay being short (2.5 months), it was not possible to access and review all the policy documents, frameworks and report neither interview all key stakeholders. However, the analysis based itself on reports and recommendations presented in various technical review meetings by MOH officials and other stakeholders during the period of stay (June-August, 2011). The analysis contained here therefore is a perspective of the author.

Conclusions, Recommendations, and Future Directions

While many have pointed out limited human and financial resources as the challenges to timely collection and reporting of reliable data and thus HMIS, according to this paper, utilization of HMIS data, poor culture of accountability, lack of incentives for performance, strategic planning and vertical programs-HIV/AIDS are the strategic contextual challenges to this menace. The paper recommends to those engaged in planning interventions to strengthen HMIS to be cognizant with these realities.

Data utilization at all levels in the health care system will be the linchpin in realization of timely collection and reporting of data and thus the goals of HMIS and to this end, a user-friendly system is at the core of any successful public health system when it will;

- Assist hospital managers to align health system resources with the needs of service users

- Link performance measurements to accountability
- Monitor health-related activities to help assess what works and what doesn't
- Contribute to organizational development

The new framework emphasizes the integration of HIV/AIDS data into the national HMIS, there is a need to recognize that unless culture of timely reporting is addressed, lack of data may stiff efforts to mobilize resources from the donor community; as such efforts to stamp out the epidemic may be undermined.

This paper recommends a framework (Figure 1) for timely collection and reporting of data that will emphasis a cyclic cycle of data utilization at all levels in the health care system, data use that transforms facilities into learning organizations, data use and learning leading to organizational development at all levels. The organizational transformation through data utilization will breed ownership that will see organizational commitment in form of resource allocation. This will create and sustain demand for timely data collection and reporting of reliable data. To enhance the analysis and use of data/information, there may be need to upgrade the position of hospital records officers to strategic information officer with abilities to analyze and interpret data.

Key factors in the implementation of the framework are leadership, change management, organizational embedding and capacity development.

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