

HEALTH INFORMATION AND MANAGERIAL WORK: EXPLORING THE LINK

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Abstract: Health information systems are tools to support management. Responsible for service implementation; yet tasked with monitoring performance of service delivery; PHC facility manager cadres lack the authority to take decisions about change in practices. It is thus relevant to explore the nature of management work at this functional level and how this work links to the information system created to support management processes. Three key questions were asked: what is the role of these managers; what is the context within which information is used; and, what information is relevant to support management practices. Within common core management tasks, a range of management roles were identified. These were largely utilised in processing information about operational issues that impact on service delivery. As in related empirical studies on management work, the findings revealed a high dependency on soft data obtained from informal information systems rather than that of the formal system; an information mismatch. Future challenges involve discussion on how to align this information mismatch.

Keywords: management work, roles, information systems, decision making, South Africa.

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1. INTRODUCTION

It is often stated that an information system is a tool to help improve management by using available information for decision making (Mandelli & Giusti, 2005; T Lippeveld, 2001). Underlying this is a number of assumptions. Firstly, that the aim of an information system is to use information for action and secondly that if available, it will be used to facilitate decision making. This implies a relationship between management and information; that the main job of managers is to make decisions and that information is linked to decision making.

Empirical evidence suggests that the reality is often very different. This paper sets out to explore the role of information in management within a health care setting. Specifically, this paper will explore what it is that local level primary health care (PHC) facility managers do, how they do it and how this links to the use of information and the information system. The research rationale is twofold; firstly, to deepen our understanding of the role of managers by exploring the context within which information is used and secondly, to contribute to a broader discourse on how to support the practice of health managers, specifically, how to strengthen the use of information in the decision making process amongst health management cadres.

The paper provides some initial data on the nature of management work carried out by PHC facility managers. This provides an opportunity to learn whether a common core of management tasks is performed. The aim is to determine what information is relevant for PHC facility managers in performance of these tasks and how this information links to the formal information system.

Significant improvements are being made in healthcare due to information and communication technologies (WHO, 2006). Effective, integrated information systems are seen as a vital strategy to develop, implement and monitor global health interventions aimed at reducing the burden of disease (AbouZahr & Boerma, 2005). This is particularly relevant in developing countries that are juggling the, often competing, demands of government and donor organisations for information. Implicit in monitoring as a decision making activity is the power to make decisions about policy and, or practice change strategies. Differentiation in responsibility and accountability for policy development, strategic and operational planning for service implementation as well as monitoring and evaluation of performance between various management levels in the health system is described in a range of policy documentation (Hall, Ford-Ngomane, & Barron, 2005; T. Lippeveld, Sauerborn, & Bodart, 2000). However, while functional responsibility for service delivery may be delegated to local levels, management authority tends to remain highly centralised in many developing country contexts (Berman & Bossert, 2000; Haga, 2001). While information is commonly required at district and national levels, it is the local level services, bearing responsibility for implementing services that generate and provide this information. Tasked with monitoring performance, it is thus relevant to explore the nature of management work at this functional level and how this links to the information system created to support management processes.

Health management literature provides rich examples of the management practices of nurse managers in a range of patient based service settings (Edwards & Roemer, 1996; Young, 2002). However, the nurse driven PHC setting within which facility managers in the South African context work, poses different challenges. With implementation of the PHC package of services there has been a dramatic shift in the work practices of nurse clinicians at this level, from providing traditional preventive services within a community health paradigm, to offering a broad range of curative services that involve diagnostic and prescribing procedures. The nurse clinicians are responsible for interventions that impact on the health status of communities, as determined by global health status indicators. As part of their responsibility for implementation of services, the

PHC facility manager is called upon to monitor performance in terms of coverage, quality and efficiency of service delivery for whole communities served. Yet there has been limited discourse on how this translates into practice, specifically with regard to the role of the PHC facility manager and the context within which information is used; what information is relevant to support management practices at this level is unclear. In an environment where local level providers do not have real decision making power to change operational policy and practice, the nature of management work, and thus the relationship with the information system, is unclear (Østmo, 2007).

The challenges posed by trying to balance the health needs of individual patients on the one hand, yet deal with the realities of working in an ever changing socio-political and economic policy environment, requires a knowledgeable and skilled manager. The regulatory environment within which the PHC facility manager works is uncertain and as a scope of practice for the PHC facility manager slowly unfolds there is ongoing debate on the knowledge, skills and competencies required. In addition, this paper will contribute to deepening our understanding of the role of the PHC facility manager in the practice setting.

2. THEORETICAL PERSPECTIVE

It is recognized that effective management is essential to improving accountability in health service delivery (T. Lippeveld, et al., 2000). Health information systems are the tools whereby managers can monitor and evaluate performance. Why are managers not using these tools? Two main reasons are cited. On the one hand the information systems themselves are not comprehensive or readily available. On the other hand, the structure of the health organisation does not clearly identify the managers, their roles or their authority; these three aspects are inextricably linked.

Health information systems literature abounds with case studies that describe the organisational complexity in re-shaping the management work practices of health care staff (J. Braa, Heywood, & Hedberg, 1999; Hunter, 1996; Jacucci, Shaw, & Braa, 2006; Mukama, Kimaro, & Gregory, 2005; Mutemwa, 2005). The changing socio-economic environment, within which organizational change is taking place, has resulted in a 'mixed-bag' approach to the development of management structures within the health system. In many developing country contexts health managers are drawn from the ranks of practicing clinicians, resulting in a duality of roles for health managers, the clinical - managerial paradox (H. Muquingue, Kaasbøll, & Berg., 2002).

Although there is extensive discussion on the complexities and problems of information systems in health organisations (Alvarez, 2004; J Braa, Monteiro, & Sahay, 2004; Gouws & Gregory, 2005; Heeks, 2002; Williamson & Stoops, 2001; Williamson, Stoops, & Heywood, 2001), what is lacking are empirical studies that 'reconcile the normative rhetoric for health information systems with observed problems in relation to management tasks' (Mutemwa, 2005). It is only when we understand what managers do; that we can customize health information systems to meet the practice needs of management cadres. This will in turn inform the core knowledge, skills and competencies required at each level of management; the basis of management capacity building programmes (Hales, 1999).

Management is commonly described in terms of activities aimed at achieving desired objectives and the powers and responsibilities to make decisions. Gorry and Scott Morton (1989) provide a useful framework for exploring the nature of managerial work that includes an understanding of both the purpose of management activity (involving planning and control at strategic, tactical and operational levels) and the way in which managers solve problems and make decisions. The "distinction between problem solving and decision making as more than just semantic" highlight both the complexity of issues and tasks that confront managers and the need for flexibility in developing relevant models of decision making support systems.

Information systems are designed to support management activities, in particular, better decision making. Critics of decision making models such as Van Lohuizen's knowledge driven model and Lasswell's linear model reinforce the 'messy reality' and unstructured nature of management issues within complex cultural, social and political contexts (Lippeveld et al. 2000). The identification of technical, behavioural and organisational determinants in the PRISM analytical framework provides an approach to understanding both barriers to information use and strategies to strengthen decision making (LaFond et al. 2005)

The strengthening of data demand and information use is suggested as a useful approach for supporting evidence based decision making (Foreit et al. 2006). However, a review of the steps involved in evidence based decision making processes highlight the uncertain arena of managerial work within the activities of problem solving and decision making. A first step in exploring decision making models relevant to the health sector is to deepen an understanding of the nature of managerial work.

Despite 'identifying variations and particularities', accounts of management work over the past thirty years have largely reinforced Mintzberg's categorization of management roles. The various management activities, described in terms of ten roles performed, were categorized into three groups; inter-personal, informational and decisional (Hales, 1999; Mintzberg, 1975). It therefore seems appropriate to initiate an exploration of what PHC facility managers do by determining how their work relates to these ten roles (table 1).

In recent literature, the leadership role has been emphasized as dealing with change through engaging and inspiring others, while management is coping with the complexity of the daily operations of an organization. Muquingue (2008) found that novice managers with clinical background were trained for handling complexity but lacked leadership skills.

3. METHODOLOGY

This study forms an initial exploration of management work. The researcher set out to capture the views and experiences of PHC facility managers in a variety of PHC facilities; urban and rural, large and small in two health districts in the Western Cape, South Africa. The rationale was to obtain insights into how these contexts differentially affect the nature of management work. A series of both structured and semi-structured interviews were held with sixteen PHC facility managers in order to explore their role, information needs, sources of information and how this knowledge is learned,

Secondary interviews were held with four managers in order to clarify identified themes. On-site observation was done in five cases wherein managers were observed in performance of their routine tasks. A combination of note taking and recording was done during and after interviews and discussions. No statistical analysis was done; rather Mintzberg's (Mintzberg) categorization of management roles was used as an analytical tool to organize and frame the data.

Documentation related to the practice of management such as legislation, policies, strategic plans, meeting agendas and reports were reviewed for contextualisation of information in management activities.

4. CASE DESCRIPTION

4.1 THE CONTEXT WITHIN WHICH PHC FACILITY MANAGERS WORK

The backbone of health care delivery in South Africa is the nurse-driven PHC service with over 4500 mobiles, clinics and community health centres. In each health facility there is an individual appointed to be in charge of the facility, the facility manager. Commonly, this manager is a senior professional nurse with extensive clinical and administrative experience. In charge means translating health policy into practice within a socio-political, ethical and legal framework. In

practice the facility manager is responsible for implementing a core package of health services in accordance with national policy guidelines.

In the South African context, democracy related health sector reform implemented the vision of a primary health care approach to service delivery with the creation of a district health system as the vehicle for managing health services. However, despite policy statements about decentralising service delivery to the local level, without the effective transfer of power for decision making, there has been limited freedom to take strategic or operational decisions about change in practices (Consortium, 2004; Leon, Bhunu, & Kenyon, 2001). This is particularly relevant for PHC facility managers who have responsibility for service implementation, but no real decision making authority.

The broad policy framework within which PHC facility managers work state that the aim of management is to improve, maintain and monitor service performance in terms of efficiency, coverage and quality of care (Campbell, 2003; *The Primary Health Care Package for South Africa: a set of norms and standards*, 2000). Indeed, the national health management information system (HMIS) is comprised of health status, quality of care and service efficiency indicators. The optimistic suggestion that the implementation of a district based HMIS will promote a culture of local analysis and use of information has had limited success. Reality has demonstrated that managers seldom seek information from the formal information system and once given it, do not find it relevant, useful, understandable or meaningful (J Braa, et al., 2004; Gouws & Gregory, 2005; Williamson, et al., 2001). This was challenged by Østmo (2007) who found that this type of discourse neither described nor addressed the context within which the PHC facility manager functions. This was reinforced by Gouws and Gregory (2005) in their conceptualisation of information systems as social systems wherein the failure of the formal information system to consider the information needs of managers was reinforced by the inappropriateness of defined indicators for local relevance.

The norms and standards for practice as laid out in the PHC service package (*The Primary Health Care Package for South Africa: a set of norms and standards*, 2000) describe the core management functions of planning, control and supervision with the following types of statements: hold monthly staff feedback meetings, provide community consultation and use data from the standard health information system. In this regard, the PHC facility manager is required to ensure that monthly and annual data is checked, graphed, displayed and discussed with staff and the community health committees. In theory this sounds good, but in reality, the individual is left without clear instructions of how to implement this.

While policy documentation refers to the development of global and national strategies to deal with critical health issues, there is limited discussion on the strategic and operational use of information by PHC facility managers to support local initiatives. Over the past fifteen years, the vacuum created by the delay in finalising health sector legislation, with the associated policy and practice guidelines, has resulted in confusion about management roles and decision making power.

Three contextual distinctions are made of the context within which PHC facility managers work; the urban – rural work setting, age and formal training and facility size. Historically, PHC facility managers appointed from the ranks of professional nurses with the longest clinical service record required no formal management training. This is changing. Increasingly, the trend is to appoint a professional nurse with broad experience in a variety of clinical settings as well as interest in and, or training in management. In rural settings, facility managers tend to be older and have a long service record, while in urban settings; managers tend to be younger, with formal qualifications in nursing or public health administration and often, management. A similar trend was found with regard to facility size.

4.2 THE NATURE OF PHC FACILITY MANAGERS WORK

PHC facility managers all stated that they have learned their craft from their predecessors. This mentoring process forms the most powerful and important source of experiential learning of both explicit and tacit knowledge of the work of a manager. As PHC facility managers, in the roles of figurehead, liaison, disseminator and spokesperson, interact with a wide stakeholder group such as facility staff, senior management, colleagues and community members, they are ideally situated to utilize these networks to both strengthen their own knowledge and skills base as well as use the information generated to support decision making processes.

When asked what the role of a PHC facility manager is, the most common reply given is, to plan, to control and to supervise. In unpacking what is meant by these terms, managers highlight three main areas of work in carrying out the many and varied tasks that they deal with on a daily basis; i) dealing with staffing and resource issues, ii) dealing with patients, community and senior management and iii) handling service demands and unexpected problems.

Data concerning the work of PHC facility managers revealed a high degree of consistency in the roles described in both urban and rural settings. The data reflected both a common core of management tasks and the wide variety of roles performed by this management cadre. The data was explored for thematic groupings according to the ten roles described by Mintzberg. These are described in Table 1.

As figurehead, fulfil organisational and social obligations, ceremonial and symbolic
<ul style="list-style-type: none"> ➤ I represent the facility at all official functions - management and community meetings ➤ As manager, everyone comes to me – to discuss with me - all matters come back to me
As leader, deal with all HR issues
<ul style="list-style-type: none"> ➤ I set the tone and make sure we all work together as a team - I must keep my staff happy ➤ I sort out staff duties – shifts, shortages, workstations – coordination of the team
Through liaison, create networks to interact with staff, colleagues, community and managers
<ul style="list-style-type: none"> ➤ I liaise with others service levels and managers such as programme managers (TB, ARV) ➤ I must know what is going on everywhere in my facility - must have good ‘people knowledge’ and communication skills to be able to deal with everyone - patient complaints, community and staff issues
Through monitoring, observe and collect information on what is going on
<ul style="list-style-type: none"> ➤ I must have an in-depth knowledge of what goes on – do quality assurance checks – walk around - find gaps – reshuffle resources and give feedback on performance ➤ I must compile monthly reports and sign off on all stats before it leaves my facility
As disseminator, provide information to facility staff
<ul style="list-style-type: none"> ➤ I must keep my staff informed about what is going on in the health service ➤ I must give feedback to my staff from meetings I attend on what I am told about the services – new things that are happening and on how well or poorly we are doing
As spokesperson, represent the facility at outside meetings
<ul style="list-style-type: none"> ➤ I must inform senior management on facility activities - defend our performance and report ad-hoc problems to supervisors ➤ I must inform the community on what we are doing and plans to improve services
As entrepreneur, handle the demand for change process
<ul style="list-style-type: none"> ➤ I must organise staff training so that we can provide quality services ➤ I must manage new health programmes – if staff are resistant to change – talk to them – show them what to achieve and how it improves service delivery – it helps to reduce resistance
As disturbance handler, deal with urgent problems
<ul style="list-style-type: none"> ➤ I must fix any problems that arise at any time

➤ I must deal with emergencies, both clinical and administrative – sort out transport for a critically ill patient - patient complaints
As resource handler, facilitate and coordinate work activities
➤ I must balance workload with resources - reshuffle resources such as staff allocations
➤ I must make sure that work gets done - interconnect all points – staff, patients and work
As negotiator, deal with staff, patients, supervisors and community
➤ I must keep my staff happy - deal with patient complaints
➤ I must sort out supervisory issues and negotiate for more staff and service cutbacks

Table 1. Activities of Facility Managers according to roles

The high degree of consistency in the roles described indicates that the context does not differentially affect the nature of management work. However, descriptions of how information is used suggest variation in the approach to decision making activities. The categorisation of work into roles facilitates exploration of the link between management and information. In a basket exercise conducted to test Mintzberg's classification, Shapira and Dunbar (1980) concluded that there were two main facets in management work and re-grouped the ten roles into two categories; roles dealing with the generation and transmission of information and roles that involve formulation and execution of decision making (Table 2).

The categorisation of roles further suggests two ways of dealing with information; action triggered information, the information pull and information triggered action, the information push. A large focus of management work is directed at processing information about operational activity, the information pull. The formulation and execution of decisions is based on presentation and discussion of received information, the information push. An information push - pull model to explain this phenomenon is currently being developed.

Table 2. Categorisation of roles

Mintzberg Framework		Shapiro Framework	
Category	Roles	Category	Roles
Inter-personal	<ul style="list-style-type: none"> • Figurehead • Leader • Liaison 	Information generation & transmission	<ul style="list-style-type: none"> • Figurehead • Liaison • Disseminator • Spokesperson
Informational	<ul style="list-style-type: none"> • Monitor • Disseminator • Spokesperson 	Formulation & execution of decisions	<ul style="list-style-type: none"> • Entrepreneur • Negotiator • Leader • Disturbance handler • Monitor • Resource allocator
Decisional	<ul style="list-style-type: none"> • Entrepreneur • Disturbance handler • Resource handler • Negotiator 		

5. DISCUSSION

PHC facility managers relate to information in various ways. A large component of management work is directed at generating information about operational issues that potentially impact on service delivery. Regular 'walk-about' to observe staff and work allocation functionality enables identification and clarification of potential problems, the action triggered information pull.

Liaising with staff, peers, management cadres and community groups enables both the generation and transmission of the so called 'soft information' obtained through informal data sources. Thus PHC facility managers process information from different sources in order to facilitate their ability to act in a variety of roles, such as figurehead, liaison, disseminator and spokesperson, resulting in

information pull or action triggering information. This information can then be used to engage in discussion with stakeholders about the services. These discussions are multi-purpose; to inform, to explore possible solutions to identify problems, or to motivate for changes in operational practices, resulting in information triggered action, the information push.

The nature of PHC facility manager work is twofold. Firstly, PHC facility managers are concerned with patient based activities. A large component of their work is related to dealing with issues such as patient tracing and follows up, continuity of care, referrals and organising transportation to other services. Related to these activities are the human resource issues around addressing staffing shifts and work allocations. Solving ad hoc facility based problems often require on the spot decisions; decisions which are based on the extensive tacit knowledge of an experienced PHC facility manager. This is the information push. The soft information generated in this regard is commonly obtained through the informal information system.

Secondly, PHC facility managers are concerned with addressing the larger health service and community health status activities. The main activities are related to disseminating information to a range of external stakeholders such as senior management and community forums on performance of key service areas. An aspect of this is related to negotiating changes in policy directives or addressing community concerns. This is the information push.

While PHC facility managers have authority to make decisions about patient based activities, it is in the larger health service and community arena that the use of information based on the formal information system is debated. The health systems organisational structure and authority base for decision making is unclear and discussion in this arena is limited.

Exploration of the sources commonly used to obtain information revealed a strong 'information pull' approach; that most information was obtained through informal sources, comprised soft data and that PHC facility managers responded to this information differently. In two facilities, one urban and one rural, PHC facilities managers identified a common problem, that of low immunisation coverage.

In the small rural clinic, the manager stated that the staff had informed her that there was a problem – 'they knew their community and reports were that children were not coming'. In consultation with her staff, they planned to conduct an ad-hoc immunisation campaign within the month. On further questioning, the manager was uncertain what the status of immunisation coverage was in the formal information system and had not referred to it for verification. There was no recent immunisation data available in the facility.

In the large urban community health centre, in identifying the problem of low immunisation coverage based on information obtained from staff and community, the PHC facility manager believed that they could not rely only on data from the formal information system. In recognising the need to verify the information, they requested a formal investigation into the situation to verify the information. A public health graduate student was contracted to research the case.

Although both PHC facility managers acknowledged that data from the formal information system was useful, more relevance was placed on the soft data obtained from informal sources such as feedback from staff, health educators and community workers. It is interesting to note that in neither facility was recent immunisation data from the previous quarter readily accessible and that data tables used were based on raw data. There was no conversion of this data into health status performance indicators, despite explicit national policy on monitoring performance of key health status indicators. Further query revealed that although the managers believed the formal data on number of children immunised to be correct, there was concern that the denominator data was not a true reflection of the population in the catchment area. In both communities there had been a large migration of people in recent years. The data suggests that the urban – rural context affects

the way information is processed and thus decision making activities, indicating further research in this arena.

PHC facility managers engage with the formal information system on a regular basis when they, in figurehead, liaison and spokesperson roles, attend monthly and quarterly service and programme management meetings held with peers and supervisors at district level management forums. The 'information push' through feedback on facility level performance provides a valuable mechanism for discussion of operational factors that impact on service delivery. This processing of information expands the tacit knowledge base of the PHC facility manager. This in turn informs the type and format of information disseminated to their staff. In liaison and spokesperson roles, the PHC facility managers engage in negotiating the formulation and execution of decision making. However, the final decision on execution is generally made by higher level management cadres.

Informal information thus forms both the primary mechanism through which they are informed about service issues as well as the process through which problems and decisions are handled. This reinforces the findings that they collect and use information related to patient management to a large extent and health service performance to some extent (Østmo, 2007). There is a strong well established culture of information use at PHC service level, albeit one that is not formally acknowledged or formalised in the policy driven formal information system. This suggests that there is a mismatch between the formal and informal information systems. Strategies for strengthening of information use may require a radical revision of the way in which we structure the health information system, incorporating aspects of the informal information that is relevant to lower level management cadres.

Given the narrow scope of decision making authority within which PHC facility managers practice, managers tend to concentrate decision making activities around streamlining operational service delivery. Decisional roles tend to focus on resource allocation and ad-hoc problem solving. Although PHC facility managers deal with 'real-time' operational issues that make up their day to day tasks, consideration of the increasingly well defined legislative and policy structures that provide the operational framework for service delivery, such as monitoring performance and target setting, informs the organisation of both new and existing services and associated staff training needs. An in-depth knowledge of service delivery, from both a clinical and managerial perspective has been identified as a critical factor in addressing such challenges.

Muquingue (2008) found that district managers in Mozambique were ill equipped for the leadership role. The South African managers devoted most of their time at the operational issues, confirming that coping with the complexity of day to day operations is more emphasized than leading change efforts. However, the immunization campaigns and investigations into such need found in South Africa, demonstrates that they are capable also of initiating change, being the hallmark of the leader. While the district managers in Mozambique came directly from the medical school in the capital, the South African managers were experienced clinicians and had experienced being managed by others before being promoted to the role themselves. They had thus become socialized into the managerial practices of their predecessors, while the Mozambicans had not been exposed to similar experience.

6. CONCLUSIONS

The idea that information use is central to effective health management is not questioned. While many PHC facility managers state that they use information in the discussion of health related issues, few examples of how information from the formal information system informs action in decision-making are available. The description of the nature of management work illustrates both a common core of tasks performed and that information is central to management work. As in related empirical studies on management work, the findings revealed a high dependency on soft data obtained from informal information systems rather than information generated in the formal

system; an information mismatch. Knowledge on what information is relevant, as well as where and how to obtain it, is strongly influenced by the tacit knowledge gained through experiential learning. Recognition of the relevance of soft information from informal sources in processing information for the multiplicity of management roles supports the call to acknowledge the value of their management work and the building of local ownership for management of service delivery at the facility level.

The description illustrates a link between information and management and more specifically, the nature of the relationship between management activity, authority for decision making and use of information. This paper contributes to the discourse on the use of information for management by building on the work of Østmo (2007) who, in describing the context within which PHC facility managers work, argued that they have a strong culture of information use; that they 'value and use information for management, both formal and informal, when the available information is relevant to their tasks and they have the authority to use the information to make decisions'.

The use of information, irrespective of availability, is linked to and may be regarded as dependent on decision making authority and relevance to managerial work (Lippeveld et al. 2000). A large focus of management work at the PHC facility level is directed towards operational problem solving. The development of evidence based decision making support systems must address both management activity relevance and practice based ways of solving problems and making decisions. Framing a description of the nature of management work carried out by PHC facility managers in the context of roles performed, deepens our understanding of the complexity and variety of tasks performed in a multiplicity of roles.

The preliminary work on development of the information push-pull model to explain ways of dealing with information offers opportunity for further investigative study. While the findings suggest that the urban – rural, facility size context does not differentially affect the nature of management work, descriptions of how information is used suggest variation in the approach to decision making activities. Further research into this aspect will support identification of core knowledge, skills and competencies required to support management capacity building initiatives.

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