This is a repository copy of *Healthcare services managers: what information do they need and use?*.

White Rose Research Online URL for this paper:
http://eprints.whiterose.ac.uk/9125/

Article:

MacDonald, J., Bath, P.A. and Booth, A. (2008) Healthcare services managers: what information do they need and use? Evidence Based Library and Information Practice, 3 (3). pp. 18-38. ISSN 1715-720X

Evidence Based Library and Information Practice

Healthcare Services Managers: What Information do They Need and Use?

Jackie MacDonald
Library and Knowledge Management Services
Shared Services (Dalhousie School of Nursing – Yarmouth Site, Annapolis Valley Health, South
Shore Health, South West Health)
Yarmouth, Nova Scotia, Canada
Centre for Health Information Management Research
Department of Information Studies, University of Sheffield, Sheffield, UK
E-mail: jmacdonald@swndha.nshealth.ca

Peter Bath
Senior Lecturer in Health Informatics, and Director Centre for Health Information Management
Research (CHIMR), Department of Information Studies
University of Sheffield, Sheffield, UK
E-mail: P.A.Bath@sheffield.ac.uk

Andrew Booth
Director of Information Resources, and Reader in Evidence Based Information Practice
School of Health and Related Research (ScHARR), University of Sheffield
Sheffield, UK
E-mail: A.Booth@sheffield.ac.uk

Abstract

Objectives – The purpose of this research project was to gain insight into the
information behaviour of healthcare services managers as they use information
while engaged in decision-making unrelated to individual patient care.

Methods – This small-scale, exploratory, multiple case study used the critical
incident technique in nineteen semi-structured interviews. Responses were analyzed
using 'Framework,' a matrix-based content analysis system.

Results – This paper presents findings related to the internal information that healthcare services managers need and use. Their decisions are influenced by a wide variety of factors. They must often make decisions without all of the information they would prefer to have. Internal information and practical experience set the context for new research-based information, so they are generally considered first.

Conclusions – Healthcare services managers support decisions with both facts and value-based information. These results may inform both delivery of health library services delivery and strategic health information management planning. They may also support librarians who extend their skills beyond managing library collections and teaching published information retrieval skills, to managing internal and external information, teaching information literacy, and supporting information sharing.

Introduction and Context of Study

Internationally, more than $125 billion (U.S. dollars) is spent each year on research designed to improve patient outcomes (Global Forum 83). However, health research is not consistently translated so that it can be implemented in practice (Canadian Institutes), and healthcare policy decisions are made with little reference to research evidence (Brehaut and Juzwishin 4; Mitton et al. 1660; Zitner 38). Some academic researchers have suggested healthcare services managers should apply systematic decision-making approaches to all healthcare decisions (Winkler 57). Others have wondered why evidence-based approaches are not being applied to all healthcare system decisions (Kadane 565), and why accountability to evidence is not required (Canadian Health 3).

This research was initiated when a committee, working to integrate a population health approach into healthcare services managers' decision-making, asked when in the decision process is the optimal point at which to consider population health issues. This question could not be answered from the existing research literature.

This paper presents findings from the initial phase of a two-part research project. This exploratory study examined the information healthcare services managers used to support decisions unrelated to individual patient care. These services included clinical decisions for groups of patients, such as those involved in developing practice guidelines, compliance with patient safety standards, planning chronic disease prevention strategies, and other strategic, tactical, and operational decisions made within the organization.

Definitions

For the purposes of this research, a manager is a paid employee charged with leading an organization or one of its subunits; the manager may or may not have staff to supervise or budgets to manage. A manager may be a senior executive, the CEO, or a vice president who manages a portfolio of services, a director who oversees services of two or more departments, or a department manager. A fourth category, termed "other leaders," describes managers who oversee specific initiatives within a department or service, such as injury prevention, health planning, or infection control. Other leaders generally serve as organizational information gatekeepers with respect to

their subject areas. A manager's information behaviour describes his approach to seeking and handling information at work.

This study developed working definitions for internal and external information. The research literature discusses the difference between internal and external information (Dervin 332), explicit and tacit knowledge (Nonaka and Takeuchi 8-9), tacit knowledge (Polanyi 4), cultural and explicit knowledge (Choo 111), and scientific and colloquial evidence (Lomas et al. 3). While all these concepts are relevant to this research, each seemed only partially congruent to the phenomena in this study. None of the terms adequately captured the distinction participants reported between the two. Within this study, external information is information created outside the organization, consisting of research-based information that describes what other organizations are doing as observed through visits, or reported by experts, or government reports. External information has not yet been applied, implemented, or interpreted. Internal information is information created within the organisation and may, incorporate research information that has been applied, absorbed, synthesized or translated within the organization. Internal information may be implicit knowledge or explicit information. It may be a by-product of healthcare services or purposefully written as reports, meeting minutes, policies, or practice guidelines.

Literature Review

For this research project, a comprehensive search reviewed the literature of library and information sciences, operations research, management science, medicine and the healthcare professions, medical education, health administration, information technology, and computer science. The literature was examined for research related to managers' information behaviour in

general, as well as healthcare professionals' information behaviour specifically. Searches of individual databases included MEDLINE; ACM Digital Library; Library Literature, Library and Information Sciences Abstracts; CINAHL; ABI Inform; Digital Dissertations; and Web of Science. Chaining and citation searching identified key research articles. The literature review began at the proposal stage and continued as an iterative process throughout data analysis and report writing.

Decision Influences

Organizational knowledge and other aspects of internal information are recognized as important influences on managers' decisions. Less tangible variables consist of perception of the decision's importance, its importance to the organization, characteristics of the task or problem, time pressures, decision deadlines, and simultaneous decisions or priorities facing the manager at the same time, established interpersonal behaviour patterns involving the manager, and the manager's decision role (Saunders and Jones 35).

Decision influences identified in healthcare settings incorporate a variety of personal qualities and capacities such as values and beliefs, leadership, knowledge and skills, resources, organizational support, partnership links, networking, the perceived benefit of change, and the complexity of the innovation itself (Bowen and Zwi). Factors that influence groups engaged in health policy decision-making processes involve usefulness of the innovation, the influence of the individual leading the decision, legislation, and politics (Bowen and Zwi 0602). Mitton and Patten (148) observed that in the absence of "good concrete evidence," healthcare decision makers used intuition, professional experience, knowledge of patient preferences, and situation matching. These were termed

"soft" evidence and seen to be powerful forces in decision-making.

Healthcare services managers' use of other, more tangible information has been noted. Moahi (121) observed that managers used government documents, circulating mail and correspondence, office discussions, meetings, other departments, and telephone conversations as information sources in their work. Internal information sources from finance and human resources departments (Smith and Preston) and external community-based information (UK Dept. of Health 40) that healthcare services managers might use to support decision-making have been identified. Brehaut and Juzwishin (15-20) outlined seven categories of information for consideration in health-related public policy development consisting of social and system demographics, technology, environment, economics, politics, legislation, and ethics. Two approaches were identified for classifying the information healthcare services managers' use, one for health information (Lomas et al.) and one for organizational information (Choo). Choo classified organizational knowledge as explicit, tacit, or cultural (136). For Choo explicit knowledge is rule-based and typically involves written documents such as policies, guidelines, meeting minutes, union contracts, or position descriptions. (Choo 136) . Cultural knowledge is background information incorporating shared assumptions and beliefs about the organizations' goals and capabilities, customers, and competitors. It is used to assign value and significance to new information (Choo 136). If it contains taboos, it is less likely to be shared or written down. Tacit knowledge is acquired through experience--the unspoken knowledge used by members of an organization to perform their jobs and to make sense of their worlds (Polanyi 60). Tacit knowledge is hard to verbalize, so is the most difficult form of organizational knowledge to capture.

A systematic review identified three forms of evidence used in healthcare decision-making "medically oriented effectiveness research," context free with respect to the decision; context sensitive "social science-oriented research," and "colloquial evidence," the expertise, views, and realities of stakeholders (Lomas, et al. 14-5). Categories for colloquial evidence consist of professional experience and expertise, judgement, resources, values and decision-making context, habits and traditions, lobbyists and pressure groups, and pragmatics and contingencies (Davies; Lomas et al. 15). Researchers have identified categories for social science-oriented context related scientific evidence comprised of implementation evidence, organizational evidence, ethical evidence, attitudinal evidence, organizational capacity evidence, forecasting evidence, and economics/finance evidence (Lomas et al. 14).

Health Services Managers' Information Behaviour

Aside from work related to the use of research (Baker, Ginsburg, and Langley; Caccia-Bava, Guimaraes, and Harrington 205), there have been few studies of healthcare services managers' information behaviour. A Canadian Health Services Research Foundation report notes the importance of both values alongside facts in healthcare services managers' decision-making (2). Three library and information sciences studies relevant to this research were conducted in the U.K. (Head), Botswana (Moahi) and Poland (Niedźwiedzka).

Head interviewed ten healthcare services managers, looking for differences between career managers who entered healthcare services as managers rather than as

clinicians, and hybrid managers, clinical professionals who later became managers. Head's research indicated that both groups needed internal and external information, and a case was made for health library services to manage both types of information.

Moahi used observations and interviews in a qualitative study of the information behaviour of twenty-eight healthcare planners, managers, and administrators. The study examined tasks carried out by healthcare services managers, their information needs, motivation for information seeking, information seeking behaviour, information sources and channels, and problems and barriers. Moahi concluded that her participants were similar to managers in general, with respect to their information behaviour. She determined that participants' effectiveness was hampered by a lack of information management infrastructure.

Niedźwiedzka used a mixed methods approach that involved quantitative analysis of questionnaire responses from 815 managers. Her project also included a qualitative analysis of transcripts from five focus groups and ten oral interviews. She examined the needs, preferences, and limitations of healthcare services managers as information users. She also examined the environmental factors that influenced their information behaviour. Niedźwiedzka observed that managers tend to use intermediaries, generally other staff, to search for, process, and evaluate information needed.

Although Head, Moahi, and Niedźwiedzka explored different questions, all three observed the importance of internal or local information to healthcare services. In addition to these three studies, a fourth study of managers in the not-for-profit sector is relevant for its methodology and

findings. Zach ("Modelling" 52, 54) used semi-structured interviews and the critical incident technique in a multiple case study of non-profit arts administrators' information behaviour. She found that American arts administrators relied heavily on direct personal experiences to fill their information-seeking needs, frequently "satisficing" (Zach, "Investigation" 32), or settling, for the best decisions they could make under the circumstances. They would continue to work through the rational decision-making model, searching, identifying, and evaluating alternatives, until they were certain they had made the best decision (Simon xxv. 240-1).

Managers, Their Information Behaviour in General and Internal Information

Research has determined that managers generally prefer to receive information orally (Daft, Lengel, and Treveno 356; Meertens 5; Moahi 160). Researchers who have considered managers' decisions in real world settings (Berryman 210; Lipshitz et al. 341) have classified their decision-making approach as "naturalistic decision-making." Naturalistic decision-making is characterized by time pressures, uncertainty, ill-defined goals, high personal stakes and a focus on using experience and expertise (Lipshitz et al. 332-4). Other characteristics are pattern matching, forward reasoning, and story-telling to anticipate the decision outcome, rather than searching for new information (Lipshitz et al. 341). Other research suggests that healthcare services managers may be naturalistic decision makers (Baker, Ginsburg, and Langley 101-7). Managers value internal information sources and rely on coworkers and colleagues with whom they have established relationships (MacKenzie). Information flow is often hierarchical, with managers obtaining most information from the

subordinates closest to them (Jones and McLeod 220-49).

There is little research literature related to healthcare services managers' information behaviour, their decision-making phases, or their use of information to support decision-making. The literature review failed to identify any research that reviewed how healthcare services managers deal with information gaps in decision-making. A definitive system for organizing and classifying the different kinds of information needed by healthcare services managers has not been established. This exploratory study aimed to address these issues.

Study Aims and Objectives

This project sought to examine decisions made by healthcare services managers. It aimed first to identify the types of information used in the decision-making process and then to determine whether there were differences in the types of information used at different points in the process. The study sought to determine whether the information used by healthcare services managers might be classified according to an existing classification system.

Methods

This exploratory study used a multiple case study approach. Semi-structured qualitative interviews were conducted using a critical incident technique (CIT) (Flanagan 1954). The CIT is a five-step procedure for gathering facts, and it is designed to isolate the significant or critical factors that contribute to success or failure. It is used frequently with in-depth semi-structured interviews, and it has been adapted for use in different disciplines where specific processes are being examined.

All of the nineteen participants interviewed were located in Nova Scotia, Canada. Seventeen were selected from the paid leadership of a rural district health authority and two were from volunteer board members, Participants were selected based on their work position and leadership status within the organization (i.e., senior executives, directors, managers, other leaders, or board members); by portfolio (i.e., Acute Care, Community Health, Operations, or Administration); and by employer (i.e., single district health authority, or consolidated health service).

Interview questions (Appendix) were organized in three sections: critical incident technique questions, general questions about information seeking, and population health knowledge questions. Each interview question had a set of additional probing questions to be used as needed.

All interviews were audiotaped and transcribed verbatim. They were indexed categorically with 526 terms in four broad families using ATLAS.ti 4.1 software, to provide the qualitative data analysis. The interviews were analyzed according to "Framework," a matrix-based content analysis technique developed for applied social policy qualitative research questions by the U.K. National Centre for Social Research (Ritchie and Spencer). This data analysis tool facilitates within- and between-case comparisons.

It is important to understand work related information needs in the context in which they arise (Leckie, Pettigrew, and Sylvain 101). Information behaviour research is traditionally used to study academic scholars (Case 296). Students and faculty generally focus on one subject at a time as they conduct exhaustive searches of related research literature. Information systems and services designed to meet scholars' needs may not meet the need of healthcare

services managers working in real world settings and faced with challenges such as multiple simultaneous conflicting priorities.

Framework of decision-making behaviour

After consideration of responses with respect to managers' roles (Mintzberg 59) a conceptual framework was developed from research related to decision complexity. This framework sought to establish a more complete understanding of participants' decision-making behaviour and incorporated
  • decision levels (Heller et al. 5)
  • decision modes (Lipshitz and Strauss 158; March and Simon; Allison 246; Cohen, March, and Olsen 1, 16; Mintzberg, Raisinghani, and Thêorét 246-75)
  • decision types (Canadian Health 2)
  • decision structure (Simon 31)
  • decision situations (Mintzberg, Raisinghani, and Thêorét 251).

Framework of phases of decision-making

A second framework was constructed from work by Simon (41) and Mintzberg et al. (252) to help explain when information was used in the rational decision-making processes, Simon identified four phases:
  • Phase 1, "Intelligence," identifying the problem
  • Phase 2, "Design," inventing, developing, and analyzing possible courses of action
  • Phase 3, "Choice," selecting a particular course of action from those available
  • Phase 4, "Review," carrying out decisions and assessing past choices (41).

Simon noted that "each phase in making a particular decision is itself a complex decision-making process"(43). Mintzberg and his colleagues conducted a field study
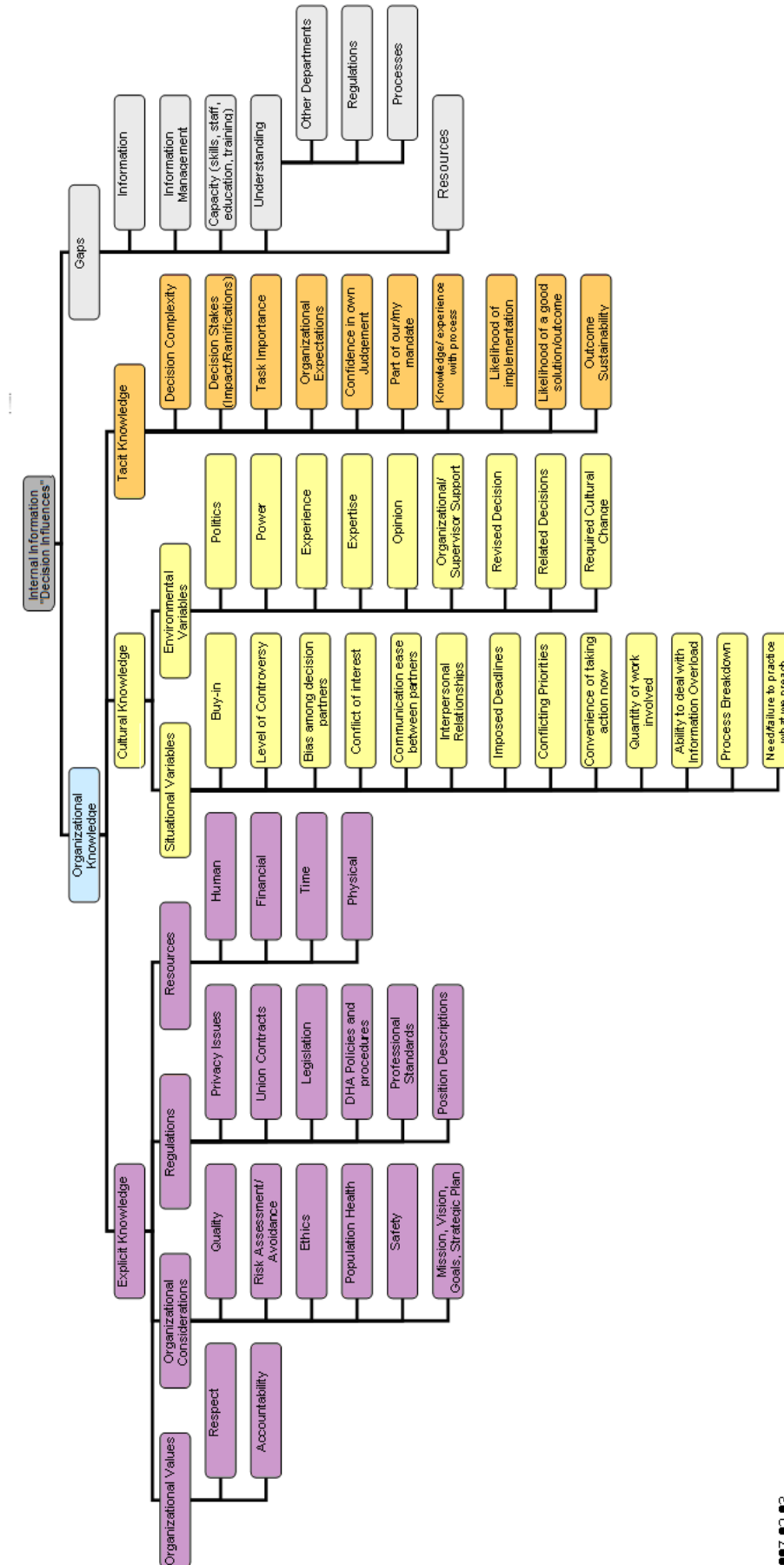
of strategic decision processes across twenty-five organizations (252). They identified three stages in the decision process, parallel to the first three phases of Simon's four-stage decision process: "identification," "development," and "selection."

Framework of information for organizational decision-making

Researchers also developed a framework to organize the information that healthcare services managers said they used or needed when making decisions. In the first round of indexing, all information mentioned in participants' transcripts was indexed by type and source of information. Passages indexed as information types or sources were then examined to see whether they influenced aspects of the decision process. These were first indexed as "decision influences," and then sorted within two broad categories--organizational knowledge and gaps. Organizational knowledge was sorted using Choo's framework for explicit, tacit, or cultural organizational knowledge (Figure 1). Information was indexed as a "gap" when participants specifically mentioned wanting information but not being able to obtain it.

Boxes at the lowest level of Fig are broad headings that may consist of two or more narrower subgroups. For example, participants mentioned patient safety, employee safety, and environmental safety. These are contained in the "Safety" box under "Organizational Considerations." Research results indicate some overlap between subcategories of explicit knowledge, Davies' categories of colloquial evidence, and context sensitive scientific evidence (Lomas et al. 14-5).

The literature review was initially unable to suggest the best way to sort cultural knowledge. Knowledge and information

Fig. 1. Organizational Knowledge and Gaps that Influenced Decisions

that influenced decisions and had been initially indexed as cultural knowledge were later sorted into two broad headings – situation variables and environmental variables -- during interview data analysis. Within this study situational variables were "decision weather," temporary conditions that might apply to only one decision situation. Environmental variables were "decision climate," of a longer duration, and more general in nature; they might apply to any situation within the department, portfolio or district. Any one of these powerful variables could effectively block progression through the decision phases. In some cases where decisions affected by cultural knowledge could not be postponed, external facilitators were used to achieve consensus.

After these categories were established and the sorting completed, an article was located where a similar approach was used. Mick, Lindsey, and Callahati identified several levels of variables affecting managers' information behaviour and labelled them individual variables, situational (task) level variables, and environmental level variables (347).

Results and Discussion

Overview

All of the nineteen interview participants had completed their post- secondary education. Eleven had graduate degrees, and four had undergraduate degrees. Of the twelve participants who were registered professionals, only one did not also have a university degree. The mean participant age was 51 years old, and the mean length of healthcare career was 21 years.

The interviews identified four main themes:
- information and decisions
- information and sharing
- information and seeking, and
- information and population health.

This paper presents findings about information that influenced decisions from the information and decisions theme. Participants' decisions were complex and multi-level. Unstructured group decisions and their decision processes were typical of the naturalistic decision mode (MacDonald et al. 23).

The findings suggest that healthcare services managers are similar to managers in general as described in the research literature. Participants' descriptions of their own roles while engaged in decision-making (MacDonald et al. 21) were similar to the managers' roles described by Mintzberg (59). Almost all participants satisficed, that is, they terminated the information search process when they felt they had just enough information for a comfortable decision, recognizing that they did not have all of the information they would have liked to have had.

These healthcare services managers' information sources were also congruent with research on managers in general, in that they obtained information from subordinates (Jones and MacLeod 232), from colleagues within the organization (MacKenzie), and from counterparts in other organization (Jones and MacLeod 232). One theory arising from these findings is that research based information is brought into the organization by middle- and lower-level managers who have both experience and expertise in a subject and understand its relevance to the organization. Some of these managers evolve into the role of information gatekeepers, while others are tasked with monitoring subject areas, contributing to group decisions, and writing guidelines for structured decision. These guidelines would typically be practice guidelines, policies, or service plans to provide guidance for frequent decisions that could be made at

lower levels. When individuals take responsibility for monitoring a subject, putting new research into context, and sharing it within the organization, decision makers can access relevant research based information earlier in the decision process. Further research is needed to determine whether information gatekeepers are an important market for health library services, to determine their information needs and to decide how to best meet those needs. These areas will be explored further in the next stage of the proposed research on information sharing.

Information use in the Decision-making Process

Responses were examined for details on what participants did when first faced with a decision situation, what information they used to support a decision, and what factors influenced the level of effort they would expend in looking for information. All participants looked for internal information, and most also mentioned looking for external information. Some participants also sought knowledge- and research-based information.

When is information used?

Using Simon's four-phase decision process outlined above (Simon 41) as a framework, responses were examined to determine when information was used in the decision-making process. Most participants considered internal information and organizational knowledge in Phase 2, the design and development phase of the decision process. Although no participants said that they found new research-based information that made a difference to decision outcomes, those who searched for research-based and other external information did so in Phase 3, the choice and selection phase. This appears to be

congruent with Dervin who observed that evidence from perception research shows that humans take external information and organize it within their own internal information to make sense out of their world (326). It also supports the definition of colloquial evidence as stated by the Canadian Health Services Research Foundation, "The role of colloquial evidence is more to inform the scientific evidence — guiding the selection and interpretation of science and filling in gaps when they appear" (2).

Few cases involved a fourth review phase, where the decision was implemented or evaluated. Most cases that did consider information in Phase 4 involved only one department, and their critical incidents were resolved by reorganizing staff within the department. There were no patterns observed with respect to these Phase 4 cases other than that they drew on tacit and explicit information about staffing and scope of practice. In the rare case where a case that reached the review stage involved more than one department, changes were made to the communication and information management processes between the departments that had led to the critical incident.

Although this research project aimed to examine healthcare services managers' information behaviour with respect to both internal and external information, study participants focused on internal information in their responses. References to external research and knowledge-based information such as found in books, journals and libraries were rare. The published literature of the health and medical professions has been indexed and organized by the U.S. National Library of Medicine in *Index Medicus* and MEDLINE, and networks of health librarians, professional organizations and publishers provide easy accessibility to health science information. It is possible that

this convenient access may be the reason why these participants did not express concern about external research based information, libraries, and library services. Another reason why libraries, library services, and research based publications were rarely mentioned is that they may still be seen simply as collections of clinical books and journals purchased, processed, and housed just in case they might be needed. Healthcare services have evolved into highly specialized organizations where the division of labour and specialization of knowledge has become narrower and more restrictive (Glouberman 10). It may be that as the amount of information directly relevant to the work of more than one healthcare worker has decreased, the value and relevance of traditional hospital libraries to information sharing has decreased. It may also be that in real world situations, decision makers rely more on experts who know both the subject and the situation and who can synthesize both in one piece of information. Further research is needed.

Canada's healthcare industry is estimated to be twenty-five years behind its banking industry with respect to information management (Fell). Contributing to the inefficiency of Canada's healthcare system is an information management infrastructure constructed from outdated, inadequate and mostly incompatible systems, according to a report from the Canadian Broadcasting Corporation. Few Canadian healthcare organizations have had the resources for a planned information management infrastructure in the form of either systems to manage internal health information or staff trained in health informatics able to understand and work with clinical data (Smith 13).

Health library user education services often focus on developing clinicians' skills to retrieve published literature, and some

focus on retrieval skills at point of care. The findings of this study suggest that there is a need to develop information retrieval skills at the "point of decision" and to expand skills beyond retrieving the published literature. This is in line with information literacy competency standards that recognize information literacy as more than information retrieval (ACRL 2).

What information influences healthcare managers' decisions?

The information that influenced healthcare managers' decisions was varied and indexed as "organizational knowledge" (Figure 1). A variety of information needs were identified but not met, these were indexed as "gaps." These factors are described below, using the categories listed in the headings used in Figure 1.

Explicit Organizational Knowledge

Participants' decisions were influenced by Explicit Organisational Knowledge, such as policies and guidelines. This knowledge was subcategorised into Organizational Values, Organizational Considerations, Regulations, and Resources.

Organizational Values

Participants described influences on decisions similar to Davies' (5) colloquial evidence category for values and decision-making context. These two quotations show how they drew on values such as respect, trust, equity, and accountability, and used internal information as sources:

"It will depend on what our philosophy is for the district and how … to incorporate that into our mission vision and values and how that may line up with some of the other work that has been out there in other places." (Other Leader)

"I like the [District] values: respect, integrity, responsibility, accountability … I try to be accountable for it … for it being right when values conflict, yes, or when ethical principles conflict; then trying to find ways to deal with that." (Manager)

Organizational Considerations

Other explicit knowledge mentioned by participants may fit within several of Davies' categories for context-sensitive scientific evidence (Lomas et al. 14). Some of the organizational considerations appear in the organization's mission, vision, and strategic directions; others are represented by committees or positions within the organization that monitor safety, including staff safety, patient safety and environmental safety, quality, risk, ethics, and population health, as shown in the following quotations:

"… how that is going to impact … patients and nurses, quality of life for the nurses, and safety for patients." (Other Leader)

"I would look at ethics principles … those would be the principles that I would go down through - and talk about with people around." (Manager)

"I actually keep a copy of the strategic plan, population health principles, and my position description; and some of this I carry with me … every day ... and it helps me keep focused on what is significant in terms of my jurisdiction." (Manager)

Regulations

Study participants were influenced by Regulations, such as legislation, policies, procedures, union contracts, position descriptions, professional standards, and privacy issues. This information was generated both within the organization and externally, often by provincial government or by professional organizations. This is

congruent with Head (43) and Niedźwiedzka (107-8) who observed the importance of legal information, guidelines, policies, and similar regulations to healthcare services managers in their decisions. These two quotations illustrate how legislation, standards and other guidelines influenced participants:

"Yes, generally if we are looking at a project … we will look at what the regulatory bodies say first … and start building from there." (Director)

"… we always look back at the standards of practice." (Other Leader)

Resources

Information on Organizational Resources was most commonly mentioned as an unmet information need. This category consisted of human resources, both numbers of staff and appropriate skill sets; financial resources, both costs and available budget; physical resources, equipment and space, and time. Organizational resources were examined in terms of past expenditures of resources for service use and this information was used to project future needs. Similar to Head's (57) study participants, these healthcare services managers had difficulty matching productivity against available resources, as described in these two quotations:

"We had to use internal information, and that was number of staff, where are their positions' workload?" (Director)

"Doing budget - what was spent in the past, why you are over? Information around productivity standards for the province, from other hospitals - what is already going on if you have high productivity standards and still are not meeting the workload." (Manager)

Cultural Organizational Knowledge

Healthcare managers' decisions were also influenced by Cultural Organizational Knowledge or background information. As discussed above, Cultural Knowledge was sorted into two categories - Situational Variables that had an impact on the immediate decision and Environmental Variables that had an impact on any decision made in the same part of the organization in the same time period.

Situational Variables

In this study, Situational Variables consisted of buy-in, level of controversy, conflict of interest, bias, and lack of bias. The following quotations illustrate the influence of situational variables:

"You can't do something usually unless you wait … have that buy-in from the top … You struggle and struggle - and all of sudden for some reason, the timing is right and it happens." (Director)

"The other thing is how controversial the issue is and who is involved with it - who is going to challenge me on it?" (Director)

Environmental Variables

Environmental Variables were internal or external. Politics and power were identified as influences on decision-making. Participants described the need to see where their decisions fit within the organization, and in some situations they have to wait for a culture change, as noted in the following quotations:

"We tried to think of who we might conscript to work on this with … Some other people were not interested in sitting down … We were not sure of the political agendas being played out … we weren't sure who we could trust." (Director)

"There is nothing more frustrating in your career than investing a lot of time, a lot of your personal emotional effort to feel strongly about something and then to have it go nowhere, because you don't really have the power to move something …" (Director)

Tacit Organizational Knowledge

Healthcare Managers' decisions were also influenced by tacit organizational knowledge, that is, knowledge that involves skills and information gained experientially and through intuition. These were sorted into several categories, including awareness of decision complexity, decision stakes, task importance and participant's confidence in their own judgement (Figure 1). These had more in common with Polanyi (60), than with Caccia-Bava et al. (205) who considered tacit knowledge with respect to healthcare services managers' knowledge of information technology within a framework of absorptive capacity. Participants drew on tacit knowledge to determine decision importance, as noted in these two quotations:

"I would look and say how important is this decision and what impact will it have one way or another on what happens. And if I kind of rate it as "this is one hell of a big decision" that has to be made, and it is going to have an impact on a ton of people, then that's the one that I am going to pick to try and take and look at everything to consider and do and take the time. And the driving force on what I do and what I use is, I think, going to be around how important and how relevant this decision is." (Director)

"Chances are if it is something that comes with a deadline, it is an important decision and would have big ramifications … and the reason there is a deadline is that they need to bring in the thoughts and ideas of other influential people within the organization; and I would never want my thoughts and ideas to go forward without

having been well researched and well educated, well put together." (Manager)

What Information is Missing when Healthcare Managers Make Decisions?

Participants identified many gaps in the internal information that they needed. These could be factors in deciding whether to continue the decision or to postpone it until additional resources were secured. They also helped participants determine what additional information would be sought in the choice phase of decision-making (Phase 3), when selections are made between alternative choices. These findings are congruent with Dervin's sense-making theory where she uses a bridge metaphor to explain how an individual who encounters an information gap between his understanding and experience needs information to make sense of his situation and then move on (68).

The following quotations are examples of participant comments about information gaps related to their specific critical incidents …

"We are starting to have [named outpatient care service] clinics, and so we are trying to gather information on that and figure out how to interpret information. We don't have as much information and are not 100% sure of what it means." (Director)

related to their gaps in information management…

"For all of the areas in the portfolio we get almost no information from a data perspective whether we are doing a good job or a bad job … a lot of the information is out there, but we haven't structured it in such a way that it filters back up." (Senior Executive)

related to their gaps in understanding other departments …

"Yes, I cannot tell you in [my service area] with any degree of accuracy how much time [my staff] … is spending on programs and activities …

because we don't have that information system in place … and that is a problem." (Director)

"… people have very little notion of how what they do impacts on other areas." (Senior Executive)

"They keep a lot of information - to get it from them may not be that easy, because the person who has it might be on vacation or they are not on site … at another hospital and call them there." (Manager)

There were other gaps related to resources needed to sustain or implement decisions, such as human resources, space and other physical resources, financial resources, and time.

No research was identified that considers what healthcare services managers do when they are not able to find the information they need to bridge a gap. As noted above, these participants satisficed. They reported that they made decisions recognizing that they did not have all of the information they needed. They may also have postponed making a decision. In this study, few cases involved decision-making in the review phase (Phase 4), where the decision had been implemented and evaluated. Where decisions were not crisis situations, any of these gaps might provide reason not to continue with the decision, perhaps helping explain why in most cases decisions paused or stopped at some point in the process. Further research would be needed to determine whether and how gaps influenced the decision process and how healthcare services managers cope with gaps, when they decide to satisfice, and when they decide to postpone decision-making.

Conclusions and Implications for Further Research

This paper presents findings about the information that healthcare services

managers use in decision-making unrelated to individual patient care. It identifies points during the decision process at which information is used.

All participants in this interview study drew on information in the intelligence and design phases of decision-making (the first two of four decision phases), and most also engaged with information during the choice (third) phase. They tended to consider internal information that had been created or had already been implemented within the organization in the intelligence (Phase 1) and design (Phase 2) stages, when they identified the problem and determined possible courses of action. In these phases information was gathered to set the context, and information gaps were identified. In some cases, participants actively searched for additional external information in Phase 3, to help select a course of action from alternatives. In other cases, participants satisficed, that is made a decision without all of the information they would have liked. There were few cases where decisions were made in the review phase (Phase 4). In cases where internal information suggested a conflict between a course of action and organizational knowledge, where it was not supported by cultural or tacit knowledge, or where crucial gaps encountered could not be bridged, participants postponed the implementation of their decisions or terminated the process.

The research findings presented in this paper provide some evidence to support librarians who have expanded beyond traditional health sciences library services. These findings may suggest that healthcare services managers are more likely to use research-based information to support their decision-making if their internal information is well enough managed so that their most basic information needs are met. The same skills that librarians have used to manage collections of publications may be of great value to the organization if they extend their services beyond the walls of the library. Librarians might find ways to manage information created within the organization, and to integrate it with external, research-based information. Research to determine how well the academic model of library services delivery meets healthcare services needs may also be useful.

This study suggests that healthcare services librarians should look holistically at information literacy within their organizations. When they identify gaps in information literacy skills they should partner with other departments to determine how to address these gaps. More research is needed to determine who makes decisions, including decisions about the care of individual patients and groups of patients, who makes what decisions in healthcare services, and whether these decisions tend to be individual or group decisions. Library managers need to know more about how best to integrate information to meet the needs of healthcare services managers. Some of these issues will be explored in the second phase of this study, which will examine healthcare services managers' information sharing to support group decisions.

Works Cited

Allison, Graham T. <u>Essence of Decision: Explaining the Cuban Missile Crisis</u>. Boston, MA: Little Brown, 1971.

Association of College and Research Libraries (ACRL). <u>Information Literacy Competency Standards for Higher Education</u>. Chicago, IL: American Library Assoc., 18 Jan. 2000. 25 Aug. 2008 <file://localhost/<http/:www.ala.org:ala:acrl:acrlstandards:informationliteracycompetency.cfm>.

Baker, G. Ross, Liane Ginsburg, and Ann Langley. "Using Knowledge and Evidence in Health Care: Multidisciplinary Perspectives. Ed. L. Lemieux-Charles and F. Champagne. Toronto: University of Toronto Press, 2004. 86-114.

Berryman, Jennifer M. "Judgements During Information Seeking: A Naturalistic Approach to Understanding the Assessment of Enough Information." Journal of Information Science 34.2 (2008): 196-206. doi:10.1177/0165551507082589

Bowen, Shelley, and Anthony B. Zwi. "Pathways to "Evidence-Informed" Policy and Practice: A Framework for Action." PLoS Med 2.7 (2005): e166. 30 Aug. 2008 doi: 10.1371/journal.pmed.0020166

Brehaut, Jon D., and Don Juzwishin. Bridging the Gap: The Use of Research Evidence in Policy Development, Sept. 2005. Alberta Heritage Foundation for Medical Research, Initiative #18. 25 August 2008 <www.ihe.ca/documents/HTA-FR18.pdf>.

Caccia-Bava, Maria do Carmo, Tor Guimaraes, and Susan J. Harrington. "Hospital Organization Culture, Capacity to Innovate and Success in Technology Adoption." Journal of Health Organization Management 20.2-3 (2006): 194-217.

Canadian Broadcasting Corporation. "Doctors too slow to embrace electronic health records" 25 May 2007. 30 Aug. 2008 <http://www.cbc.ca/health/story/2007/05/25/electronihealthrecords.html#skip300x250>.

Canadian Health Services Research Foundation. Health Services Research and Evidence-Based Decision-Making, June 2000. 30 Aug. 2008 <http://www.chsrf.ca/knowledge_transfer/pdf/EBDM_e.pdf>.

---. "Weighing Up the Evidence. Making Evidence-Informed Guidance Accurate, Achievable, and Acceptable." [International Workshop]. 29 Sept. 2005. 2 Sept/ 2008 <http://www.chsrf.ca/other_documents/pdf/weighing_up_the_evidence_e.pdf>.

Canadian Institutes of Health Research. Innovation in Action. Ottawa: Canadian Institutes of Health Research, 2004.

Case, Donald O. Looking for Information: A Survey of Research on Information Seeking, Needs, and Behavior. 2nd ed. Amsterdam: Academic Press, 2007.

Choo, Chun Wei. The Knowing Organization: How Organizations use Information to Construct Meaning, Create Knowledge and make Decisions. 2nd ed. New York: Oxford University Press, 2006.

Cohen, Michael D., James G. March, and Johan P. Olsen. "A Garbage Can Model of Organizational Choice." Administrative Science Quarterly 17 (1972): 1-25.

Daft, Richard L., Robert H. Lengel, and Linda Klebe Treveno. "Message Equivocality, Media Selection, and Manager Performance: Implications for Information Systems." MIS Quarterly 11.3 (1987): 355-66.

Davies, Philip. "Evidence-Based Government: How Can We Make It Happen?" Canadian Association of Paediatric Health Centres Annual Meeting, Montreal, QC, Canada. 9 Dec. 2007.

Dervin, Brenda. "From the Mind's Eye of the User: The Sense-Making Qualitative-Quantitative Methodology." Qualitative Research in Information Management. Ed. J.D. Glazier and R. R. Powell, 1992. 61-84.

---. "Strategies for Dealing with Human Information Needs: Information or Communication." Journal of Broadcasting 20 (1976): 324-51.

Fell, Anthony. S. "Letter to Mohamed Dhanani, resigning as Director of the Toronto Central Local Health Integration Network" 2 Apr. 2007. 30 Aug. 2008 <http://www3.thestar.com/static/PDF/070419_fell_letter.pdf>.

Flanagan, John C. "The Critical Incident Technique." Psychological Bulletin 51.4 (Jul. 1954): 327-58.

Global Forum for Health Research. Monitoring Financial Flows for Health Research 2006: The Changing Landscape of Health Research for Development. Eds. Andrés de Francisco and Stephen Matlin. 2006. 17 June 2007 <http://www.globalforumhealth.org/filesupld/monitoring_financial_flows_06/Contents.pdf>.

Glouberman, Sholom. Health and Everything: What's Next in Population Health. A Workshop Presented by the Change Foundation, 2001. 20 Nov. 2003.

Head, Angela L. "An Examination of the Implications for NHS Information Providers of Staff Transferring from Functional to Managerial Roles." MSc. Economics thesis. University College of Wales, Aberystwyth, Wales, UK 1996.

Heller, Frank, Pieter Drenth, Paul Koopman, and Veljko Rus. Decisions in Organizations: A Three County Comparative Study. London: Sage, 1988.

Jones, Jack William, and Raymond McLeod. "The Structure of Executive Information Systems: An Exploratory Analysis." Decision Sciences 17 (1986): 220-49.

Kadane, Joseph B. "Bayesian Methods for Health-Related Decision Making." Statistics in Medicine 24.4 (28 Feb. 2005): 563-7.

Leckie, Gloria J., Karen E. Pettigrew, and Christian Sylvain. "Modelling the Information Seeking of Professionals. A General Model Derived from Research on Engineers, Health Care Professionals, and Lawyers." Library Quarterly 66 (1996): 161-93.

Lipshitz, Raanan, Gary Klein, Judith Orasanu, and Eduardo Salas. "Taking Stock of Naturalistic Decision Making." Journal of Behavioral Decision Making 14.5 (Dec. 2001): 331-52.

Lipshitz, Raanan and Orna Strauss. "Coping with Uncertainty: A Naturalistic Decision-Making Analysis." Organizational Behavior and Human Decision Processes 69.2 (Feb. 1997): 149-63.

Lomas, Jonathan, Tony Culyer, Chris McCutcheon, Laura McAuley, and Susan Law. Conceptualizing and

Combining Evidence for Health System Guidance: Final Report. Ottawa. Canadian Health Services Research Foundation, May 2005. 15 Dec. 2007. Accessed 30 Aug. 2008 <http://www.chsrf.ca/other_documents/pdf/evidence_e.pdf>.

MacDonald, Jacqueline M., Peter A. Bath, and Andrew Booth. "Healthcare Managers' Decision Making: Findings of a Small-Scale Exploratory Study." Proceedings of 12th International Symposium on Health Information Management Research, Sheffield, UK, July 2007. Eds. Bath Peter A., Albright K. and Norris T. University of Sheffield, Sheffield, UK: July 2007. 17-27.

MacKenzie, Maureen L. "Managers Look to the Social Network to Seek Information." Information Research 10.2 (2005).

March, James G., Herbert A. Simon, and Harold Steere Guetzkow. Organizations. 2nd ed. Oxford, UK: Blackwell, 1993.

Meertens, Lucas O. "Changes in Information Source Preference of Managers Over the Decades." 6th Univeristy of Twente Student Conference on IT, Enschede, The Netherlands. 2008 Feb. 2. 2 Sept. 2008 <http://referaat.cs.utwente.nl/new/paper.php?paperID=184>

Mick, Colin K., Georg N. Lindsey, and Daniel Callahati. "Toward Usable User Studies." Journal of the American Society for Information Science 31.5 (Sept. 1980): 347-56.

Mintzberg, Henry. The Nature of Managerial Work. New York: Harper and Rowe, 1973.

Mintzberg, Henry, Duru Raisinghani, and Andre Thêorét. "The Structure of "Unstructured" Decision Processes." Administrative Science Quarterly 21 (1976): 246-75.

Mitton, Craig, San Patten, Howard Waldner, Cam Donaldson "Priority Setting in Health Authorities: A Novel Approach to a Historical Activity." Social Science & Medicine 57.9 (Nov. 2003): 1653-63.

Mitton, Craig, and San J. Patten. "Evidence-Based Priority-Setting: What do the Decision-Makers Think?" Health Services Research and Policy 9.3 (July 2004): 146-52.

Moahi, Kgomotso H. "A Study of the Information Behavior of Health Care Planners, Managers and Administrators in Botswana and Implications for the Design of a National Health Information System." Diss. University of Pittsburgh, 2000.

Niedźwiedzka, Barbara. "Barriers to Evidence-Based Decision-Making Among Polish Health Care Managers." Health Services Management Research 16.2 (May 2003): 106-15.

Nonaka, IIkujiro, and Hirotaka Takeuchi. The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation. New York: Oxford University Press, 1995.

Polanyi, Michael. The Tacit Dimension. New York: Doubleday, 1966.

Ritchie, Jane, and Liz Spencer. "Qualitative Data Analysis for Applied Policy Research." Analyzing Qualitative Data. Ed. A. Bryman and R. G. Burgess. London: Routledge, 1994. 172-94.

Saunders, Carol and Jack William Jones. "Temporal Sequences in Information Acquisition for Decision Making: A Focus on Source and Medium." Academy of Management Review 15 (1990): 29-46.

Simon, Herbert A. Administrative Behavior: A Study of Decision-making Processes in Administrative Organization. New York, NY: Macmillan, 1947.

Smith, Jeremy. "WANTED Cyber Clinicians to Transform the Nation's Healthcare System Bit by Bit." Canadian Healthcare Manager 12.3 (2005): 14-5.

Smith, Les, and Hugh Preston. "Information Management and Technology Strategy in Healthcare: Local Timescales and National Requirements." Information Research 5.3 (2000).

UK Department of Health. Overview and Scrutiny of Health - Guidance. London: U.K. Department of Health, 18 July 2003. 2 Sept. 2008 <http://www.dh.gov.uk/en/Publication sandstatistics/Publications/Publications Legislation/DH_4009607>.

Winkler, Robert L. "Why Bayesian Analysis Hasn't Caught on in Healthcare Decision Making." International Journal of Technology Assessment in Healthcare 17.1 (Winter 2001): 56-66.

Zach, Lisl. "When is "Enough" Enough? Modelling the Information-Seeking and Stopping Behavior of Senior Arts Administrators." Journal of the American Society for Information Science And Technology 56.1(Jan. 2005): 23-35. DOI: 10.1002/asi.20092

Zach, Sarah E. "When is "Enough" Enough? an Investigation of the Information-Seeking and Stopping Behaviors of Senior Arts Administrators." Diss. University of Maryland, College Park, MD, USA, 2002.

Zitner, David. "Is Sane Management Possible in a Crazy World?" Healthcare Papers 3.3 (2003): 36-43, 66-71.

Appendix

Participants were each asked to think of a critical decision they had made in the very recent past. This was to be a decision outside their normal routine – one they had not encountered before, perhaps one leading to initiating or terminating a new service orprogram, or one that had a direct impact on budget.

Interview Questions

1. How did the decision come about?

2. What did you do first?

3. If you used any information to help make your decision, where did you get it?

4. If you used information that you were given or had already, what did you use, in terms of specific kinds of information?

5. If you didn't have the information you knew you needed, where did you go first?

6. Did you use any other source?

7. What information did you need but couldn't find?

8. What information did you find most useful?

9. How did you decide when you had enough information?

10. If you were making this decision over again, what would you do differently, if anything.

General Questions

11. How do you tend to approach information related to your work with AVH? Which do you tend to do, keep up or look for information when you need it?

12. When you look for information to support a decision or perform a task, which do you tend to do – look for information to support one alternative, or map out two or more possible alternatives and look for information to support both or all of them?

13. What factors influence the level of effort you spend looking for information? (Level of effort is the time and trouble needed to obtain information; the cost, number and types of sources checked; their ease of use or familiarity, location, accessibility, and ease of access.)

14. During the course of your work with AVH, what are the most common types of decisions or tasks for which you look for information?

15. Generally, if you could pick one information format, which would you prefer - verbal, printed, video, or electronic?

16. Is there anything else you think I should know about the way you look for information?

Population Health Questions

17. During our 2002 accreditation, was the meaning of "the Population Health Approach," as it is used in the CCHSA AIM document, clear to you?

18. Please share your experiences and opinions on learning experiences as they relate to Population Health.

19. Did you use a population health approach or any other decision making framework when considering the issue we just discussed?

20. Are you familiar with, or have you seen, the AVH Population Health framework?