The Information Sharing Behaviour
of Health Service Managers:
a three-part study

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Abstract

Objectives – The purpose of this research was to gain insight into the information behaviour of health service managers as they informed critical decisions unrelated to individual patient care.

Methods – This research used two series of qualitative interviews, documentary analysis (a calendar study), a card sorting exercise and a demographic questionnaire to explore the workplace information practices of health service managers. Thirty-six managers were interviewed. Both interview studies used the critical incident technique and cross case analysis. Results are reported with observations and conclusions supported with interview content. The Second Interview Study also used within case analysis in the form of information transaction mapping. Information transactions, calendar study and card sorting exercise data were reported quantitatively.

Results – Findings included that these health service managers practiced satisficing, integrating and balancing multiple types of information from multiple sources to inform their decisions until they reached the point of information saturation. After this point, additional information would not make a difference to their decision. Their dominant means of acquiring information was oral information sharing over information seeking.

Conclusions – Healthcare services managers support decisions with both facts and value-based information. Lower levels of managers and hybrid managers might benefit from library and information services designed to support them as information gatekeepers. The findings may also encourage health researchers and health research funders to make sure their research informs information sources that health service managers find most convenient to use. These include explicit information such as professional standards, and interpersonal sources such as positional information gatekeepers, experts and conferences.

Acknowledgements

Publications

Papers in Peer Reviewed Journals

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MacDonald, J.; Bath, P.A.; Booth, A. (2008). Healthcare service managers: what information do they need and use? *Evidence Based Library and Information Practice, 3*, 3, 18-38.

MacDonald, J.; Bath, P.A.; Booth, A. (2008) Healthcare managers' decision-making: findings of a small-scale exploratory study. *Health Informatics Journal, 14*, 4, 247-258.

Conference Proceedings

MacDonald, J.; Bath, P.A.; Booth, A. (2007). Healthcare managers' decision-making: findings of a small-scale exploratory study. *In:* Bath, P.A. *et al.* (eds.) *Proceedings of the 12th International Symposium on Health Information Management Research,* Sheffield. p. 17-27**.** *Awarded the prize for the best presentation at the symposium.*

Conference Presentations

Healthcare managers' decision-making: What information do they need and use? Presentation, Canadian Health Libraries Association Annual Conference, May 31, 2007.

Information overload and information poverty: Do they impair healthcare service managers' effectiveness? Presentation, Health and Biosciences Libraries Section 74th IFLA General Conference and Council, 9 August 2008, Québec, Canada.

Information overload & information poverty: An example of healthcare service managers. Public Lecture, Dalhousie School of Information Management, Halifax, Canada, March 18, 2008.

Health Informatics: What information are we talking about anyway? Presentation, Atlantic Nursing Informatics Conference, Halifax, Canada, October 3, 2008.

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Chapter 1 Introduction

Health services have been described as the most complex of organizations to manage (Glouberman and Mintzberg, 2001b), "high velocity" environments (Stepanovich and Uhrig, 1999) "in which there is rapid and discontinuous change … such that information is often inaccurate, unavailable, or obsolete" (p. 198). Health service managers "plan, organize, direct, control and evaluate" delivery of health services (Service Canada, 2010). This thesis provides an account of a three part, qualitative, exploratory study of the information behaviour of health service managers, the complexity of their decision-making and the role that information plays in this.

This study explores health service managers from an information behaviour perspective, an area that few researchers have explored. Although the setting is a rural district health authority in Nova Scotia, Canada, it may provide a more widely applicable view of information and decision-making among health service managers in other settings, and of managers in general, and suggest concepts and frameworks useful for the study of managerial work.

Decision-making by health service managers is of interest with respect to two main problems: rising health services costs and perceived low use of health related research. It is of national importance in Canada where federal legislation spells out to the provinces how care is to be delivered, and the provinces struggle with increasing costs to meet federal requirements. It is important internationally for the same economic reason (Gray and Ison, 2009). For example, in the United States rising health service costs have exceeded overall economic inflation annually for the past fifty years (Bodenheimer, 2005).

Little is known about actual research uptake by health service managers. Although billions of dollars are spent globally on health research each year (Global Forum for Health Research, 2006), health research is seen as not being consistently translated to practice (Canadian Institutes of Health Research, 2004). It has been suggested that faulty or delayed decisions may result if not supported with adequate information (Zitner, 2003; Kenny, 2002).

This chapter provides an introduction to this research. It begins with a description of the study setting; a rural, publicly funded health service in Nova Scotia, Canada. Then it provides background on the current state of health information management in Canada. It also provides information on the researcher, discusses why the research questions were chosen, what the study aimed to do, the methods were used and provides an overview of thesis chapters.

1.1 Study Setting - Annapolis Valley Health, Nova Scotia, Canada

Nova Scotia (Figure 1-1), the second smallest of Canada`s ten provinces, is predominantly rural. About 55% of its almost one million population live over an hour from an urban centre; half of these live in coastal communities. Traditionally industries in the province have involved farming, forestry, fishing and mining. The province has nine District Health Authorities (DHAs). There is also one tertiary care facility for women and children that serves Eastern Canada's four Atlantic Provinces. Health costs were expected to consume 41% of Nova Scotia's annual budget in 2010.

Figure 1-1 Map of Nova Scotia DHAs showing location of Annapolis Valley Health
(Community Counts, 2006)

Nova Scotia's densest rural population is in the Annapolis Valley (Community Counts, 2007); a coastal farming community spread across Kings and Annapolis counties in western Nova Scotia. Just over 80,000 people live in this area of about 5,000 square kilometres (2,000 square miles), about 10% of the total landmass of the province (Nova Scotia Department of Finance, 2007). Annapolis Valley Health delivers health services through six health centres, 1,700 employees and 125 medical staff. There is a strong focus on strengthening primary care services (the patient's first point of contact with the health system) and a commitment to population health (Annapolis Valley Health, 2007).

Annapolis Valley Health (AVH) has four important characteristics as a setting for this study. It is a publicly funded health service in a G8 country, one of the world's eight most developed nations (G8 Information Centre, 2010). Most managers have multi-site responsibilities with travel as a

work requirement. Their workplace is computerized and networked providing direct desktop access to shared internal electronic information and external information including legislation, standards, databases, full-text books and journal articles.

1.2 Research Context

This research was conducted in an environment where health service managers are expected to make informed decisions with consideration to research evidence and population health planning. Canada's publicly funded health services have taken a relatively unplanned approach to information management. These issues and demographics of Canadian health service managers are discussed in this section.

1.2.1 Canadian Health Services and Information Management

The *Canada Health Act* is federal health insurance legislation that guides each of Canada's ten provinces and three territories in managing their own health services according to principles of public administration, comprehensiveness, universality, portability and accessibility (Government of Canada, 1984). About 70% of Canada's health service costs are publicly funded; the balance is privately funded by individuals and insurance plans (Canadian Institute for Health Information, 2005a). With the trend towards youth migration from rural areas to urban centres, health services in Canada's rural communities support a predominantly ageing population (Canada Health Infoway, 2007) and struggle to comply with the principles of the Canada Health Act, to provide the most commonly needed health services cost effectively and close to the people who need them.

Most provinces restructured health services at least twice since the late 1980s (Lomas *et al. 1*997) and by 2010, were again considering province-wide centralization of at least some services (Collier, 2010). In 1995, Nova Scotia's thirty-six local hospital boards were amalgamated into four regional health boards (Nova Scotia, 1995). Then in 2000, these four regional boards were expanded into nine district health authorities (Nova Scotia, 2000) with preserving the quality of patient care during restructuring a priority (Minister's Task Force on Regionalized Health Care in Nova Scotia, 1999). Over this same period, health professions became increasingly specialized with knowledge falling into narrower bands of interest, increasing the different types of health information to be managed and integrated (Glouberman, 2001). New drugs and therapeutics, advances in health technology and continuing computerization have contributed to changes in health services work.

Following restructuring in 1995 and 2000, the researcher observed that few resources were allocated to consolidating filing systems or planning for information management. New health technology was acquired with minimal coordination within and between systems and hospitals. There was little thought to data standards or to reporting data in a usable way to support health

decision-making. By 2006, some staff reported a ten year gap in service policy review and development (triDHA Library and Knowledge Management Services, 2006).

Accreditation Canada (formerly the Canadian Council for Health Services Accreditation) reviews Canadian health organizations on a three year cycle. From 2001-2008, accreditation standards included development of an information management (IM) plan. The researcher observed that most information management plans developed to meet Accreditation Canada requirements focused on individual local projects and trends rather than on planning to integrate systems and data.

Canadian health services have not had the resources to plan IM infrastructure such as systems to manage internal health information, and have not had staff skilled in interpreting information such as vital and health-related statistics (Smith, 2005). It has been suggested that an IM infrastructure constructed from outdated, inadequate and mostly incompatible systems has contributed to the inefficiency of Canada's health system (Canadian Broadcasting Corporation, 2007). By 2007, Canada's publicly funded health system was estimated to be twenty-five years behind its banking industry with respect to information management (Fell, 2007).

Within the past five years, Nova Scotia has launched both a business services system and an electronic patient record system (Corpus Sanchez, 2007).   With these advances, some data are now being captured as a by-product of service delivery.

1.2.2 Population Health and Evidence Based Practice

Two other forces that may have had an impact on how health service managers make decisions are the population health approach to planning and evidence based practice. *Population health* focuses on the health of populations rather than the health of an individual. The goals of a population health approach are to maintain and improve the health status of the entire population and to reduce inequities in health status between population groups. In addition to addressing health issues of individuals, a population health approach prompts health workers to address the health of the community as a whole and plan for the health of future generations (Health Canada, 2001). Ideally when making a decision, a manager will consider a series of population health principles and health determinants working not only to resolve the immediate issue but also to address its cause and thus prevent its recurrence. Support for population health requires a range of community based information, including demographic and epidemiological data (Canadian Institute for Health Information, 2007).

Evidence based practice (EBP) has spread from prompting health workers to rely more on research evidence when making decisions about individual patient care to influencing management and policy decisions (Lomas, 2000a). Researchers have suggested that health

service managers must begin to rely more on research evidence in policy making and service planning (Gray and Ison, 2009; Bowen *et al. 2*009).

1.2.3 Demographics of Canadian Health Service Managers

Demographic information provided by Service Canada (2010) includes distribution figures for Canadian health service managers by age, gender (40% are male, 60% are female) and work status (whether full time or part time).

 As shown in Figure 1-2, 60% of health service managers may be within a few years of achieving the retirement "Rule of 80". The *Rule of 80* allows for retirement with a pension for public sector workers who reach the age of fifty, where age plus years in workforce = 80 (Nova Scotia Pension Agency, 2006).
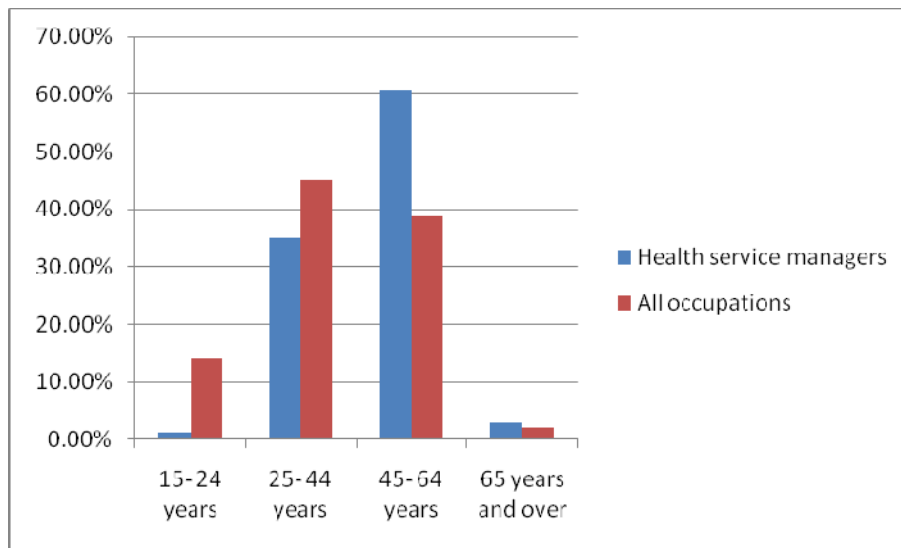
Figure 1-2 Age of Canada's health service managers compared with all occupations (Service Canada, 2010)

1.2.4 Researcher Background

This subsection describes the researcher's background, beliefs and assumptions associated with her work experience in health services, and the problem that initiated this research.

The researcher has been a librarian since 1981, a health service manager since 1998 and an information services manager since 2001. She has worked in both academic and health services settings in four Canadian provinces and six universities, including three years in a tertiary care hospital and fifteen years in two secondary care (regional) hospitals. She has served on a provincial working group to standardize health policies across Nova Scotia District Health Authorities since 2007. She has also been a member of six health service information management committees where she gathered and compared information management policies from Canada and Australia. She has managed the library and knowledge management service

shared by Annapolis Valley Health and two other district health authorities in western Nova Scotia since 1998

The researcher has been a member of the *AVH Population Health Working Group* since it was formed in 2003 to establish population health as a routine consideration in decision-making in the District (Cochrane, 2009). In developing a policy directing that all decisions include *upstream thinking* (preventing problems by addressing them at their roots), members realized that considering population health principles and determinants would require knowledge about the information sources already being used in the District, managers' decision processes, and the point at which it would be best to introduce population health issues. This research study was initiated from needs that group identified. From the perspective of the group in 2004, the study would be successful if it outlined the steps managers typically follow in making decisions and identified when they use specific kinds of information in the decision process. This might identify the optimal point at which population health information might be considered so that each decision could address both the manager's immediate need and begin to address health promotion or problem prevention related to the root cause for the future.

Beliefs and Assumptions

The focus for this exploratory research study was not generated by any hypothesis or theory to test. Instead this study was initially framed by one general belief and three specific assumptions the researcher held as the manager of library services. The general belief was that decisions are made by health service managers who use some form of information to make them. The specific assumptions follow:

First, that health service managers do not always have ready access to most of the information they need to support decisions, so must make decisions with less information than they would prefer.

Second, that if health service managers did have access to all of the information they needed, they would use it.

Third, that before health service managers use information, they assess it for relevance, value and credibility.

This study has also been framed by one local observation, that new knowledge and research based information is acquired and absorbed in the District. This observation has been based on twelve years of Library Services' statistics for literature searching and document delivery and the knowledge that all requests for information received by the Library Department's document delivery and literature search services have been met (triDHA Library and Knowledge Management Services, 1998-2010). The health service managers that participated in this

research were members of a group that regularly request and receive information searches and copies of research articles.

1.2.5 Study Timeline

The researcher worked full time as a health service manager while conducting this research. Data gathering, analysis, and chapter writing progressed as follows:

July 2004-March 2005: first draft of Literature Review carried out.

April 2005-November 2006: part 1 of the research carried out, the First Interview Study[*]

January-February 2008: part 2 of the research carried out, the Calendar Study

March 2008- October 2009: part 3 of the research carried out, the Second Interview Study*

October 2009-December 2010: writing up and final revision.

1.3 Research Aim and Questions

This research had one overall aim, to investigate information behaviour among health service managers. This study began with the one main research question:

What are the information needs and uses of health service managers, what are their information behaviours, and what are their barriers and challenges?

An answer to a secondary question would follow from these findings:

What information seeking models best represent the information needs of this group?

These research questions evolved and were refined as the study progressed.

1.4 The Researcher Journey

Over the course of this work, the researcher became increasingly aware of the complexity of health service managers' behavior. She had not previously realized the implications of a work routine involving multiple simultaneous and unrelated decision situations. These decisions were rarely made by individual managers, were rarely linear processes informed by a single piece of information, and were typically made without all of the information the participants would like to have had.

First Interview Study results provided descriptions of information behaviours that the researcher had to search the literature to label. It also required contemplation in areas not previously

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[*] Part 1 of this research is called the "First Interview Study" while Part 3 is called the "Second Interview Study". These were two separate interview studies with no participants interviewed in both studies, i.e. not a longitudinal study.

considered, such as the differences between the information behaviours of academics, clinicians at point of care and health service managers, and within health service managers, differences in needs and behaviours at different levels on the organization chart and between career and hybrid managers.

Study results combined with further reading brought about two main shifts in the researcher's thinking. The first was that these health service managers appeared to engage in information sharing as their primary means of acquiring information rather than information seeking. The second was that instead of using published research information in its pure form, they preferred to use information blended with colleagues' cultural and tacit knowledge to make it more relevant to their context.

The First Interview Study highlighted but did not explain a seeming contradiction or paradox. Although these same participants regularly requested copies of research articles and literature searches, they did not mention that research information influenced their critical decisions.

To bring clarity to these areas, after the First Interview Study the research was refocused to drill down into descriptions of information and information behaviours to see what these were.

1.5 Relationship to Existing Research

The Literature Review describes several research studies that explored the information behaviour of health decision-makers. Most of these used interviews to gather some or all of the data but none shared all of the four important characteristics of this study setting: set in a G8 country with a publicly funded health service, multi-site environment and computerized workplace. Research identified on the information behaviour of health service managers was either set in for-profit health services or in single-site organizations, or conducted either at a time that predated desktop access to web-based databases and full text, or in workplaces that had not yet been computerized.

Although a number of publications about health service managers' decision-making do share these four study characteristics, these recommend how they ought to inform decisions without exploring how they actually do inform decisions.

1.6 Thesis Overview and Research Methods

The Literature Review conducted for the study is summarized in Chapter 2. Chapter 3 reviews the methods used in this research and provides a rationale for their choice.

The three-part approach to explore the information behaviour of health service managers as they inform critical decisions is described in Chapters 4, 5 and 6. Chapter 4 provides details about the First Interview Study, an initial exploration of health service managers as they inform decisions.

Chapter 5 describes the Calendar Study, a documentary analysis in the form of a meeting room calendar analysis conducted to quantify health service managers' scheduled group information sharing opportunities. The Second Interview Study is described in Chapter 6. This follow-up study used semi-structured interviews and a card sorting exercise for a more in depth exploration of these managers' use of meetings to share information to inform decisions.

Chapter 7 discusses the findings across the three parts of this research and Chapter 8 presents the researcher's conclusions including how study findings may be used in health library services or in further research.

1.7 Chapter Conclusion

This introductory chapter provided background on the research, including the study setting and changes that may have influenced the way in which study participants access and use information in their work. It noted the research aim, objectives and methods used and outlined the structure of the thesis. It also provided background on the researcher, including why she decided to investigate this topic.

The next chapter presents the literature review conducted to inform this research.

Chapter 2 Literature Review

2.1 Introduction

The literature review began at the proposal stage in 2003. In 2004, *Web of Knowledge* was used to conduct a scoping search to gain an impression of the size of the body of research literature related to information behaviours of managers in general and to health service managers specifically. *Web of Knowledge* was chosen as a useful starting point because it suggests fields of study that might be searched, together with the relative size and publication date range of the literature in each field.

General natural language terms used for the scoping search included the phrases "health managers", "healthcare managers" and "health service managers". The word stem "manage*" was combined with "information behaviour" and "information seeking" to identify publications that explored these behaviours in managers and in management. As an initial snapshot of the literature was needed to suggest disciplines to search, a decision was made to limit the scoping search to these topics but not just to research publications.   Results of the scoping search provided an overview that included opinion pieces and narrative reviews as well as research articles, reports and books involving health service managers, or managers in general as either the major focus or a minor aspect of the publication.

Disciplines suggested for further searching included the library and information sciences (LIS), operations research and the management sciences (OR/MS), medicine and the health professions, medical education, health administration, information technology, and the computer sciences. Individual databases included *MEDLINE; ACM Digital Library; Library Literature, Library and Information Sciences Abstracts; CINAHL; ABI Inform; Digital Dissertation*s, *Ebsco Health Business Elite and Emerald Management e-journals.* Terms from database controlled vocabularies and free text terms were used in search strategies that combined concepts related to managers with concepts related to information, knowledge and evidence, as well as information behaviours such as seeking and searching, and information uses such as decision-making, priority setting, resource allocation, policy development and project management,

Chaining and citation searching identified key research articles that were then examined for important references and followed forward to identify additional research. Alerts were set up to identify new publications on subjects that might be potentially relevant and that cited key papers.

The literature review continued throughout thesis writing as an iterative process as new topics were identified through data analysis. The final literature review represents research and theoretical work related to study findings and reflects the literature up to August 31, 2010.

At the beginning of this research, two definitions for *information behaviour* outlined boundaries for the literature review. These were:

- (Case, 2007) "encountering, needing, finding, choosing and using information" (p. 4)

- (Wilson, 1999) "those activities a person may engage in when identifying his or her own needs for information, searching for such information in any way, and using or transferring that information" (p. 249).

2.2 Managers' Information Behaviour

Case (2007) begins his review of information behaviour research conducted on managers with a 1993 review of for-profit managers' acquisition and use of external information (Choo and Auster, 1993). He then brings the literature forward, with emphasis on environmental scanning and reference to just a handful of other studies.

Zach (2002) used semi-structured interviews and the critical incident technique in a multiple case study of non-profit arts administrators' workplace information behaviour. The findings included that the administrators did not practice rational decision-making as described by Simon (Simon, 1947). Instead they relied heavily on direct personal experiences to fill their information-seeking needs, frequently *satisficing* (Zach, 2002), or settling for the best decisions they could make under the circumstances. Zach used Taylor's eight classes of information uses (1991) developed from research on scholars' reference desk transactions to classify arts administrators' information uses.

Reviews of information needs of managers in general have examined impact on library services (Butcher, 1998) and records management (Goodman, 1993). Other research on managers' information uses includes work from OR/MS by Simon (1978) who identified four broad classes of information use and by March (1994) who observed three classes of information use with respect to attention and search.

2.3 Health service managers and Information

Only three LIS studies on the information behaviour of health service managers have been identified to date, each conducted in a different country and with a slightly different focus.

The first of these was a 1996 MSc Economics study of UK health service managers. Head (1996) interviewed ten health service managers, looking for differences between *career*

managers who entered health services as managers rather than as clinicians, and *hybrid managers*, clinical professionals who later became managers. She found that hybrid managers carried over some skills learned as health professionals to their management roles, and that the nature of their information need changed from that experienced in their earlier role. Hybrid managers who continued to work and try to keep up in their clinical areas had more complex information needs than career managers. Problems described by these managers included poor quality internal information and internal information such as service statistics unavailable in the form they needed. Head concluded that both hybrid and career managers needed both internal and external information and proposed that health library services manage both types of information for them. One study limitation is the small number of participants; all were drawn from two local trusts. Another limitation that might make this study less relevant in 2010 relates to the pre-internet era in which the thesis was conducted.

The second of the three LIS studies was a 2000 LIS PhD study of Botswana health service managers (Moahi, 2000). Observations and interviews were used in a qualitative study of the information behaviour of twenty-eight health planners, managers, and administrators. The findings included that the information needs that arose from their functions, work roles and tasks served as reasons to embark on an information seeking process. Their information sources and channels and the role and extent to which the existing information system is used were also identified. Moahi determined that participants' effectiveness in information seeking was hampered by inadequate information management infrastructure. She identified a wide range of other barriers that included infrastructure problems such as inadequate access to and distribution of documents, inadequate library services, and communication problems such as idiosyncrasies associated with people as information sources (Moahi, 2000). This was a larger study than the UK research (Head, 1996). However, its relevance in 2010 may be limited because it was conducted in a health organization that had not yet adopted computerized information systems or networks.

The third was a PhD study of Polish health service managers undertaken in 2000[*]. Niedźwiedzka (2003a, 2003b) used a mixed methods approach to gather information from 815 health service managers using questionnaires and interviews. Information needs, preferences, and limitations of health service managers as information users and environmental factors that influenced their information behaviour were explored. There were four key findings:

1) Managers lacked reliable research-based information;

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[*]This thesis was read only through three English language articles; the PhD thesis was written in Polish.

2) They generally felt uninformed about development of scientific applied research, and had difficulty following it;

3) They lacked the skills to use information systems and services such as libraries, information centres, and internet directly by themselves; and

4) They obtained job related information from various intermediaries including lower level, administration staff, experts, computer specialists, peers, and others.

She found that the managers perceived information as insufficient and scattered and that their information environment did not allow effective transfer of evidence and knowledge into the process of decision-making (Niedźwiedzka, 2003b). One limitation of this research may be that it focused on use of information traditionally managed by libraries and made available through mediated traditional library services, though a conclusion was that health service managers were not generally the end users of these services.

Two other studies on decision-making in health services from perspectives other than information behaviour are directly pertinent to this research, one from South Africa (Mbananga and Sekokotla, 2002) and one from the United States (Kovner, 2005).   The South African study used qualitative interviews to explore how 11 South African health service managers used patient data collected and managed by information systems. Barriers and challenges to effective information use included inferior data quality and inadequate information management infrastructure. Among that study's conclusions was that simple decisions could be informed easily and successfully by routine data while decisions that are more complex require additional information and research (Mbananga and Sekokotla, 2002).

In a more recent study, a health policy researcher conducted thirty-minute phone interviews with 75 US health service managers and experts to inquire about research knowledge transfer. The researcher (Kovner, 2005) decided to use interviews because "*Not enough is known about the research questions to justify a large quantitative study"* (p. 16). As they gathered information, researchers altered the interview questions to gather data that were more meaningful. The study concluded that, in searching for evidence, managers are limited by time available and competing priorities. They experienced difficulties obtaining and translating relevant evidence so it could easily be used and adapted. Other conclusions were that most managers did not read the research literature because they did not have capacity to evaluate it or it did not address or answer their questions. They obtained most of their evidence from colleagues within their own systems, consultants, peer groups, and professional meetings (Kovner, 2005). A limitation of this study was that data collection involved note taking rather than taping and transcribing. Another limitation related to participant selection. Rather than using any kind of recruiting or sampling frame, participants were chosen either through referral by other participants or convenience because the researcher knew them. They were mostly senior or mid-level managers were

chosen from a single health organization rather than a balanced cross section of managers at all levels chosen from multiple organizations.

The findings of the five studies described above are similar to each other and to several other studies that explored why health service managers do not use research evidence. Through focus groups and interviews, a study of Canadian health decision-makers involved in priority setting identified barriers to using evidence that included crisis orientated management, time constraints and a lack of skills (Mitton and Patten, 2004; Mitton *et al.* 2003). Bowen *et al.* (2009) found that the obstacle to health service managers' use of evidence in a Canadian health service organization lay in structural, contextual and system level barriers, not in the simple transfer of research. In an US study, Kovner and Rundell (2006) observed that a management quality chasm exists in health services where few ineffective or harmful management decisions are examined or used for learning. They identified a gap between what we know about health service managers' questions and what health service managers do.

The extent to which research results have been integrated into health decision-making at the program planning level has been studied in Canadian public health managers with a resulting recommendation that researchers identify the information needs and preferences of their target audience and take these into consideration when conducting and translating research (Dobbins, 2007). There is prescriptive literature on how health decision-makers should approach decision-making (Gray and Ison, 2009; Kadane, 2005; Kenny, 2002) and a body of mostly theoretical, and somewhat controversial, work on evidence based health services management (Young, 2002; Walshe and Rundall, 2001; Hewison, 1997).

Mintzberg and Glouberman (2001a) described hospitals to be "extraordinarily complicated organizations" (p. 56) made up of four separate and independent structures: the nurses who care, the doctors who cure, the managers who control and members of the community that volunteer and serve on governance boards.

Moahi (2000) looked at tasks carried out by health managers, their information needs, motivation for information seeking, information seeking behaviour, information sources and channels, and problems and barriers to information. She concluded that participants in her study were similar to managers in general with respect to their information behaviour.   Labadie (2005) used a metaphor of fire fighters and arsonists at a house fire to describe the difference between health service managers and health services researchers. He likened health service managers to fire fighters, running around trying to put the fire out and researchers to arsonists, getting their matches ready to see if the house down the street will burn the same way.

Choo and Auster (1993) found that managers in general frequently need to solve immediate problems that are presented to them, rarely with time to study them or to read related research

and may take action even before they identify or clarify their own goals. Although it has been suggested that managers' jobs are similar with respect to work roles (Hales, 1993; Mintzberg, 1973), LIS theorists and researchers have suggested that they are not alike with respect to information behaviour (Bouthillier, 2003; Case, 2002). Even managers of smaller businesses have been described as a heterogeneous group with respect to information needs and uses, with individual, cultural, industrial and organizational differences (Bouthillier, 2003).

No other research was identified that considered whether health service managers are similar to other groups with respect to their information needs and practices. Perhaps for theoretical reasons or because students and faculty are more available as research subjects, LIS research on information seeking has developed primarily of studies of scholars (Julien and Duggan, 2000). How well general LIS information behaviour research conducted on students and faculty can be applied to health service managers is unclear.

The next part of this chapter summarizes publications that have examined the information that health service managers do use or should use to inform their decisions.

Information that Health Service Managers Use

Health decisions about individual patients and populations have been seen as based on values, resources and need with little use of research evidence (Gray and Ison, 2009). Mitton and Patten (2004) described "soft evidence" used by health service managers in the absence of "good concrete evidence" as "powerful in driving decisions" (p. 147).

When research and other literature related to health service managers and information is brought together from various disciplines, it suggests that while health service managers do support decisions with information, their use of health research is less apparent than academic health researchers and research funders consider optimal. Table 2-1 lists information described in the literature as used by health service managers to inform workplace decisions.

Information	Reference
Social and system demographics, technology, environment, economics, politics, legislation, and ethics	Brehaut and JuzwishIn 2005, p. 13
Usefulness and complexity of the innovation, the influence of the individual leading the decision, and the influence of the organization, beliefs and values of policymakers, timing, economic costs, and politics, leadership, knowledge and skills, resources, organizational support, partnership links, networking, and the perceived benefit of change	Bowen and Zwi, 2005, p. 166
Factors other than evidence: Experience and expertise, judgement, resources, values and decision-making context, habits and traditions, lobbyists and pressure groups, and pragmatics and contingencies.	Davies, 2007, p. 5
Three different forms of evidence — colloquial evidence (Colloquial evidence can usefully be divided into evidence about resources, expert and Professional opinion, political judgment, values, habits and traditions, lobbyists and pressure groups, and the particular pragmatics and contingencies of the situation.), scientific evidence on effectiveness, and scientific evidence on context (evidence about attitudes, implementation, organizational capacity, forecasting, economics/finance, and ethics.	Lomas *et al.* 2005, p. 1
Government documents, Circulating mail/Correspondence, Office discussions, Meetings, Other Ministries/depts./Units/Divs, Personnel files, Telephone calls, International Organizations, Colleagues, Planning Information, Experience/Day-to-day activities, Statistics, Research, District Visits, Supervisors, Information Technology, DHT reports, Community, Health Stats. Unit, Libraries, NGOs, Patient Records, Health Research Units, Councils, Journals, Surveillance	Moahi, 2000, p. 121
Intuition, professional experience, knowledge of patient preferences, and situation matching	Mitton and Patten, 2004, p. 148
Financial information, including "multi-company general ledger, accounts receivable and invoicing, accounts payable, budgeting including statistical/manpower information, management reporting, access of information to non-financial system users, potential for system enhancement with cash management, asset, management, capital charging, purchase order and inventory control, modules". Human resources information to manage personnel and payroll, including "recruitment administration and analysis of outcomes, post establishments and headcount, personal records of staff including qualifications and training, sickness and other 'time-out' statistics, workforce planning and information requirements, statutory/mandatory returns to NHSE, remuneration of salaries, wages and expenses, analysis of pay-related data, pensions advice, including benefits, compensation and redundancy costs".	Smith and Preston, 2000
The local community strategy or plan, delivery plans, reports of the local director of public health, health equity audits, recommendations from inspection or audit reports (in the public domain, following a public meeting of the trust board), completed commission for health improvement reports, patients survey and prospectus, reports from local patient advice and liaison service (pals), reports from independent complaints advocacy service (ices), information from patients' forums within the local authority area, reports by local voluntary and community organizations which focus on health issues, local transport plans, crime and disorder reduction strategies, housing needs surveys, local neighbourhood renewal plans, completed best value reviews by local authorities, completed health or environmental impact assessments, issues arising from modernization and partnership boards within or in work of the local strategic partnership (LSP), partnership with local NHS bodies.	United Kingdom Department of Health, 2003, p. 40

Table 2-1 Information other than research evidence used by Health Service Managers

Although research can be translated for easier absorption by health service managers, organizational and cultural factors remain obstacles to its effective use.   It is also not clear whether health service managers purposely ignore research, or whether they do access it and consider it in subtle ways that are less discernible to academics and research funders. It may be that although not every decision in health is supported with a critically appraised systematic literature review, health service managers do integrate research into their decision-making.

The next sections of this literature review look at models and frameworks derived from LIS research and OR/MS.

2.4 Logic Models and Theoretical Frameworks

Logic models are used to represent theory graphically generated from empirically observed sequences of events in cause and effect relationships over time. Most models are linear, progressing left to right. Repeated cause-effect events are represented as clockwise rotation in feedback loops that form portions of linear models, and in cycles, with a sequence of cause-effect actions repeated over their entire course. *Theoretical frameworks* are similar in that they classify and list empirically observed events, generally in response to a common stimulus, but they are textual rather than graphic and events are less likely to be in a sequence or in a cause and effect relationship.

Models are useful in developing theory by proposing relationships that can be tested and by laying out thinking about a subject of interest (Bates, 2005). Models and frameworks are useful in exploratory qualitative research where the findings are to be generalized to other research theory rather than to populations. They predict action so can be tested by other research by serving as a frame of reference for comparison with what does and does not happen. However, over-generalizing models developed to simplify one phenomenon so that they will represent another phenomenon may weaken or invalidate them (Case, 2007).

This literature review identified over 30 models and frameworks related to information behaviour and decision-making from LIS research, Operations Research and the management sciences (OR/MS). Although there was overlap within and between models from the two groups of study, information behaviour models and frameworks from LIS typically nested within decision-making models from OR/MS. LIS information behaviour models have tended to focus on individual's information processes (Toms *et al.* 2008) and have not represented group information processes well (Talja and Hansen, 2006). The literature on group decision-making does not typically address search behaviours (Saunders and Jones, 1990). Choo and Auster (1993) note that information appears to "flow" into the organization with problems associated with acquiring information ignored (p. 292). Consequently, the models from OR/MS focused on decision processes instead of search processes. Most featured at least two of the four phases in a

decision characterized by Simon (1977, 1960) and Mintzberg *et al.* (1976). These were 1) *intelligence/identification*, identifying the problem, corresponding to identifying information needs in LIS models; 2) *design/development*, inventing, developing, and analyzing possible courses of action, including information seeking; 3) *choice/selection,* selecting a particular course of action from those available; and 4) *implementation and review,* carrying out decisions and assessing past choices.

As discussed below in Subsection 4.3.2, seventeen of these models were examined for overlap, dissected and integrated into a series of steps intended to approximate informing workplace decisions and used in data analysis (Table 4-3). After the First Interview Study was completed, nine of these models and frameworks were selected for discussion in this section.

2.4.1 Logic Models

Wilson's three information behaviour models incorporated his own theories with those of other researchers to reflect LIS research over two decades (Wilson, 1999). All three models involve identifying the original need with feedback loops representing repeated processes.

His first model provided only a theoretical map of information behaviour, so had limited usefulness with respect to hypothesis testing (Wilson, 1999). It did not suggest what might cause information needs but focused on search processes of information intermediaries who worked in settings where providing information was either a primary function. For example in libraries, or a secondary function, for example in car showrooms (Wilson, 1981). Wilson's third 1999 model (1999) took a problem solving approach to resolving uncertainty with either increased resolution of the problem at each stage, or a feedback loop to the previous stage.

Wilson's second, the 1996 revised general model (Wilson and Walsh, 1996c) maintained the basic framework of his first 1981 model (Wilson, 1999). Wilson described this model as one of methodology rather than as a set of activities or a situation (Wilson, 1999). It addressed two information behaviours, identifying the information need and seeking the information. The feedback loop indicated that the process continued until information needs were satisfied. Three sets of barriers or *intervening variables* were included as obstacles to beginning and successfully completing a search process: *personal barriers*, including demographic characteristics and financial, cognitive and physical ability; *social* or *role-relate*d barriers involved in interpersonal exchange, and *environmental barriers* including culture and geography; time is included both an economic and an environmental barrier (Wilson and Walsh, 1996b).
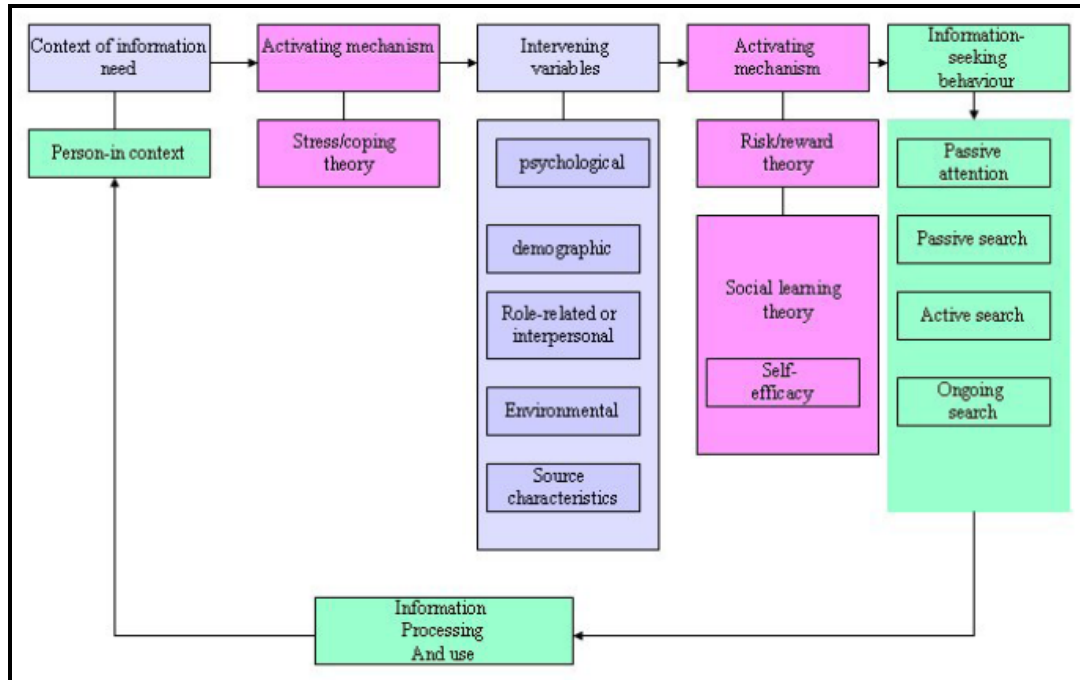
**Figure 2-1 Wilson's Revised General Model of Information Behaviour
(Wilson and Walsh, 1996c)**

Important because it has been tested with research on health service managers and subsequently revised (Niedźwiedzka, 2003b), the version of this model that appears above in Figure 2-1 has been coloured by Niedźwiedzka (2003b) to correspond to her proposed revision (Figure 2-2).

Niedźwiedzka observed that health managers depend on intermediaries to pull information together for them instead of finding information themselves (Niedźwiedzka, 2003b). Her proposed adaptation (Figure 2-2) incorporated use of information intermediaries in the search process and included use of personal knowledge and reference collections (Niedźwiedzka, 2003b).
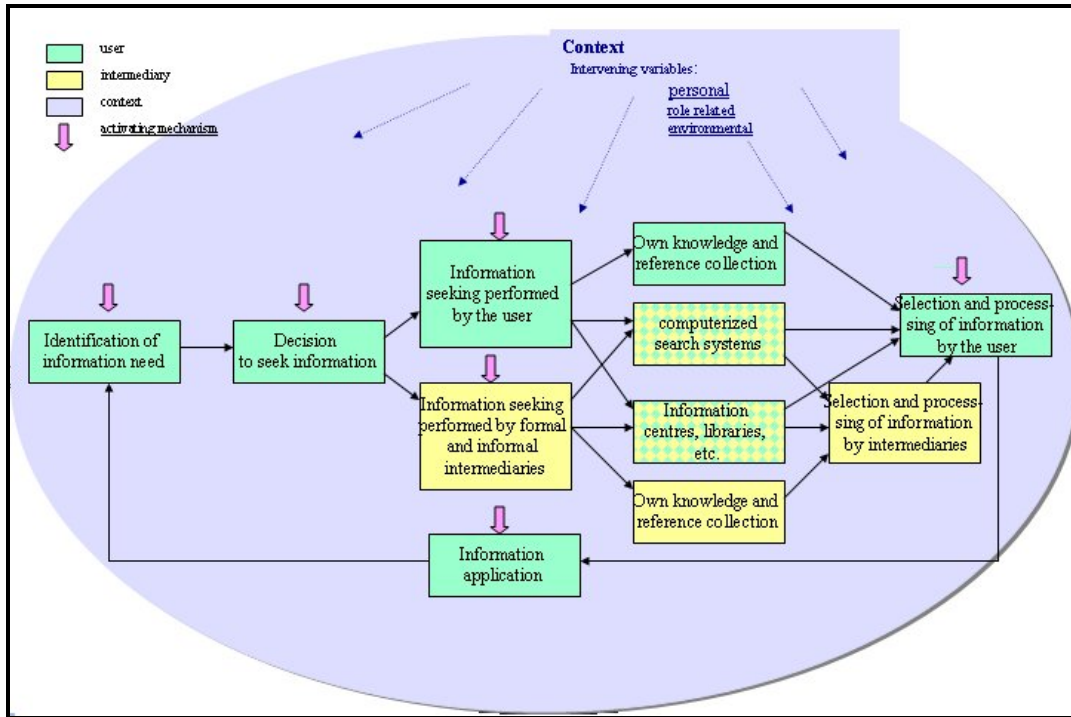
Figure 2-2 Proposed Revision to Wilson's 1996 Model (Niedźwiedzka, 2003)

Mintzberg's three-phase model placed as much emphasis on selecting the appropriate information as it did on the two phases that represent decision-making processes. Mintzberg *et al.* included only one box labelled "search" while Wilson had four, but two of the four forms information search or seeking behaviour each described were Passive Search and Active Search. The other search behaviours identified by Mintzberg *et al.* were *Memory search* through the organization, both people and paper, and *Trap search*, activating search generators such as letting suppliers know a need exists; Wilson described *passive attention*, engaging in activities information acquisition takes place unintentionally and *ongoing search,* after active searching occasional continuing to search to update or expand information.
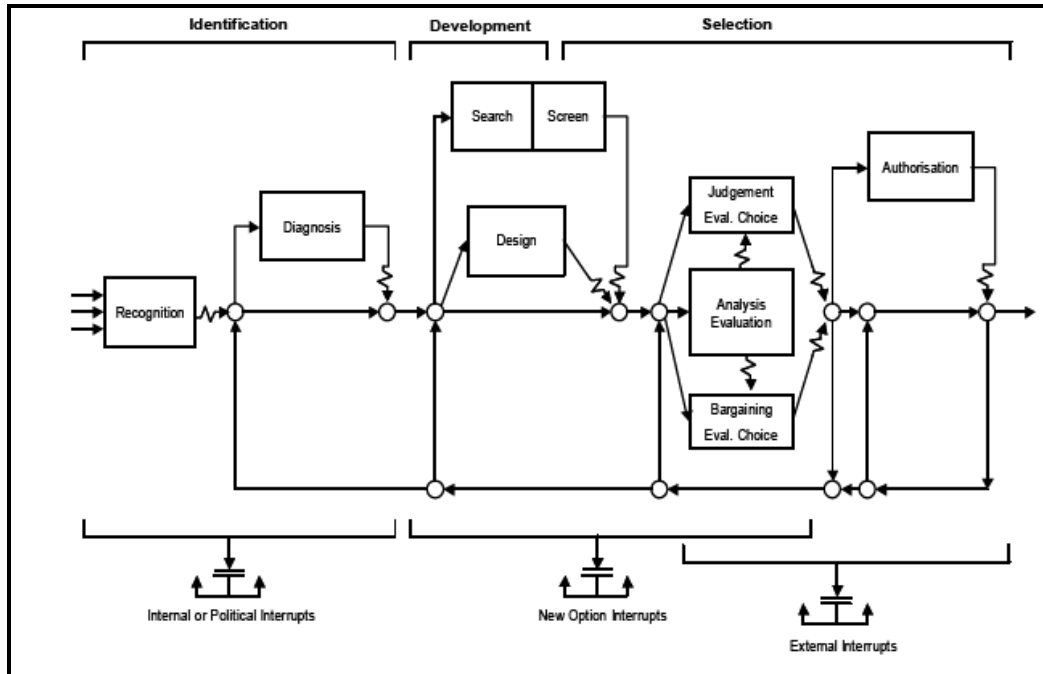
Figure 2-3 A General Model of the Strategic Decision Process (Mintzberg *et al. 1*976)

Simon (1947) described a practice in business decision-making where the importance of conserving scarce resources resulted in settling for the best decision to be made under the circumstances rather than working to "maximize the attainment of certain ends with the use of scarce means" (p. 240*).* Simon (1957) later labelled the practice *satisficing*, a word adopted from a Northumbrian term used in the Sixteenth Century (Oxford English Dictionary, 1989). Simon (1957) described satisficing as "finding a good enough move", as compared to *minimaxing*, "finding the best move" (p.205).

Simon's theory of satisficing and March's thermostatic satisficing process has been represented in March's Thermostatic Satisficing Search (March, 2010; Cyert and March, 1963) shown in Figure 2-4. This model consists of a series of separate searches within one decision situation. During the search process, information is gathered and evaluated piecemeal. If the first information item is not enough, the search continues and a second item will be gathered and evaluated. Formal search processes would be initiated only for immediate and specific reasons. The search is *thermostatic* in that targets or goals are search branch points that begin and end search behaviour, rather than alternatives. This process is repeated until enough information is gathered for a good enough decision, or some other influence triggers an immediate decision.
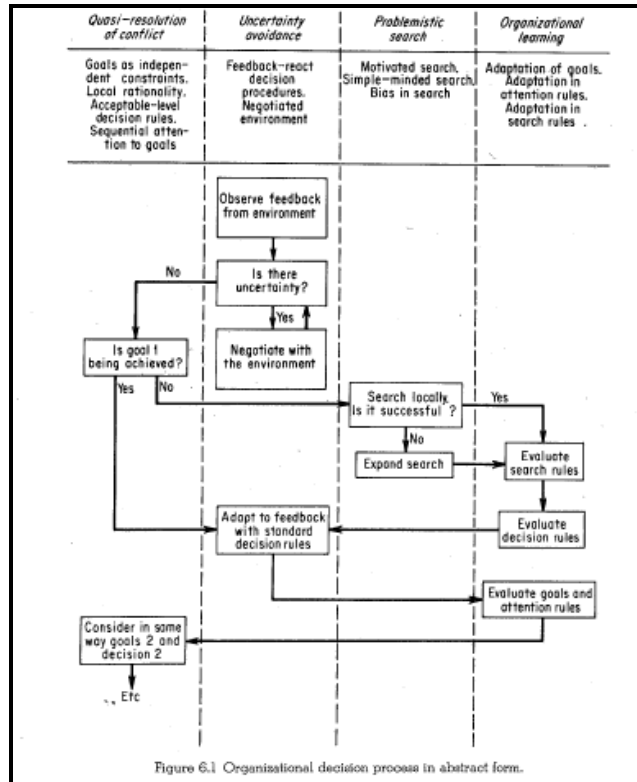
Figure 2-4 March's Thermostatic Satisficing Search (Cyert and March, 1963)

The satisficing search (March, 1994) is "active in the face of adversity" (p. 29), meaning that a satisficing decision-maker faced with a variety of poor alternatives is likely to try to change the problem rather than implement a poor alternative.

Dervin's sense-making model (1992) represents an individual in a situation where they encounter an information gap between their understanding and their experience and then bridge it using a variety of ideas, emotions, memories and attitudes to make sense of it. The idea is that they would then be able to achieve an outcome or effect of the information use, such as to make a decision in the newly created sense.

Krikelas (1983) derived an information seeking model from published LIS literature about information needs and uncertainty. In this linear model, elements of information sharing have been represented by information giving with thirteen components flowing in one direction without a feedback loop. In this model, *information* was any stimulus that reduces uncertainty, and *information need* was recognition of the existence of this uncertainty in the personal or work-related life of the individual. The information seeking continued as long as the information need existed with a variety of searches completed driven by a single need (Krikelas, 1983). Steps in information seeking were: perceiving a need, the search itself, finding the information, and using the information resulting in either satisfaction or dissatisfaction. Less directed information gathering is differentiated from more directed information seeking; Krikelas suggested that

convenience drives the selection of information sources. He differentiated between internal and external information and, within these, memory, personal files, observation, interpersonal and recorded sources.

The ninth and final model discussed in this section is the Resolving Uncertainty in Naturalistic Decision-making (R.A.W.F.S.) model (Figure 2-5). This model incorporates five broad strategies for coping with uncertainty in Naturalistic Decision-making (NDM). It focused on selection of options with information use characterized by complexities that reflect decision-making in real-world settings that are difficult to replicate in the laboratory. This model may represent opportunity or problem situations better than crises that cannot be delayed, as action may be forestalled or delayed at several points in this model. Nothing in this model suggests the purposeful single-minded search action that characterizes most LIS models where a gap is identified and then bridged.
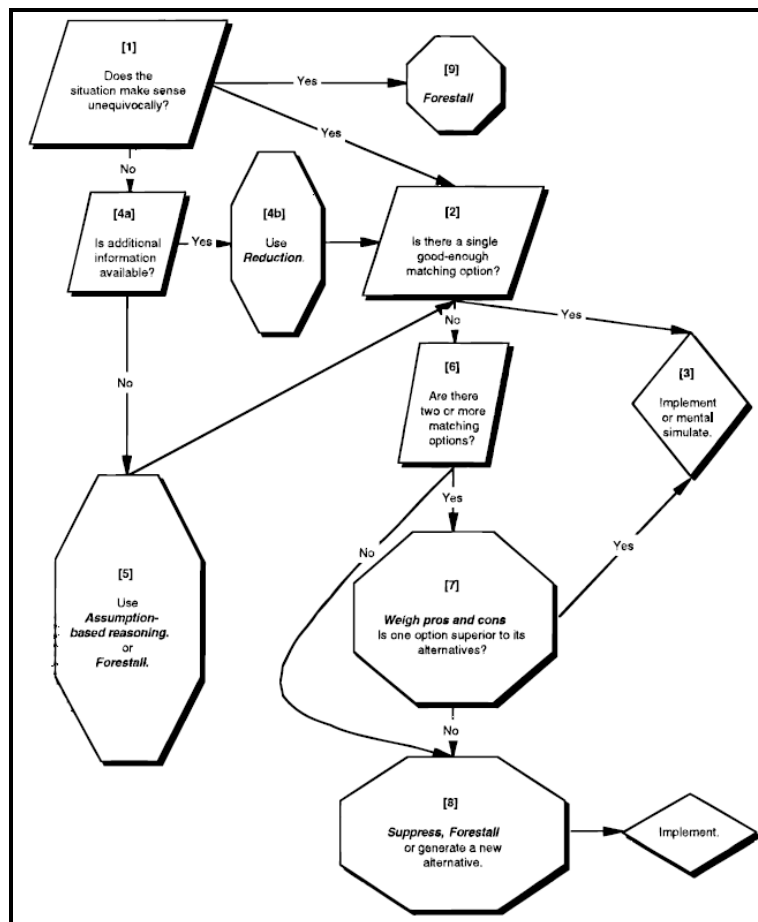
Figure 2-5 Resolving Uncertainty in Naturalistic Decision-making
(Lipshitz and Strauss, 1997)

This subsection has described logic models that might represent the information behaviour of health service managers. The next part of this literature review summarizes established and

potential theoretical frameworks within which the information behaviour of health service managers might be examined.

2.4.2 Theoretical Frameworks

This subsection discusses conceptual frameworks from LIS and OR/MS within which the findings of this study might be considered. It also brings together work on several subjects from different sources that together might be used to create a framework for data analysis. The subsection begins by noting four activities associated with information behaviour, and then discusses research that may be used to consider workplace information needs. It concludes with a summary of work on the nature of information.

Human information behaviour has been generally considered to involve identifying information needs, searching for information, and using or transferring information (Wilson, 1999). Of these four forms of information behaviour, information seeking has been the most commonly discussed (Case, 2007). General information needs have been described (Bartlett and Toms, 2005) as "well studied and characterized" (p. 1); the role of information needs research in effective information system design has been noted (Wilson and Walsh, 1996a). There has been less LIS research on information use, and consequently less is known about it (Bartlett and Toms, 2005). Finally, there has been relatively little discussion of information transfer (Case, 2007; Wilson, 1999).

In general, discussion of types of information need, Wilson (1996a) described two perspectives: what needed to be achieved and the types of questions asked. Case sees three categories of information need: seeking answers, reducing uncertainty and making sense (Case, 2002) and described how each has been explored in the LIS literature.

In OR/MS, although not labelled as such, work on information needs focuses on decision-making. As described by Simon (1992) "The work of managers, of scientists, of engineers, of lawyers--the work that steers the course of society and its economic and governmental organizations--is largely work of making decisions and solving problems" (p. 32). Simon initially differentiated between these two activities with *decision-making* defined as evaluating and choosing among alternative actions and *problem solving* described as choosing issues that require attention, setting goals, or finding or designing suitable courses of action. Subsequently, Simon revised his thinking and concluded that problem solving was part of decision-making and the two were fundamentally indistinguishable (Augier, 2000).

The next part of this subsection examines research on managers' information needs related to decisions that may contribute to a theoretical framework on decision complexity.

Decision Complexity

Organizational decisions have been studied from multiple perspectives, including alternatives or possible actions, expectations or consequences, preference or value to the decision-maker, and decision rules – how choices are to be made among alternatives (March, 1994). Factors in decision complexity identified through this literature review included decision structure, policy decision type, decision levels, decision modes, decision phases, decision situations, and decision-makers – whether individual or group.

Various workplace situations give rise to the need to make decisions, which have been classified as *opportunity decisions*, where decision-makers decide voluntarily to innovate or improve; *crisis decisions*, made in response to severe pressures; and *problem decisions*, made in response to milder pressures than crisis decisions. Decisions can also be described as problem–crisis and as problem–opportunity (Simon, 1977).

Decisions may be structured or unstructured (Simon, 1960). *Structured decisions* are routine, made on a regular basis within the organization, so that the data needed to inform the decision, the process to follow in reaching the decision and the evaluation of alternatives can be spelled out. Structured decisions can be programmed and supported through simple rules and information system data mining. *Unstructured decisions* are unique or rare. The information and processes required to meet them have not been pre-programmed because the situations have not previously been encountered within the organization in quite the same form (Simon, 1977; Mintzberg *et al. 1*976).

The Canadian Health Services Research Foundation (CHSRF) has defined three levels of health policy decision-making, each influenced by uncertainty related to differences in values and by the supply of information to support decisions made (CHSRF, 2000).

- *Public policy decisions* deal with determining what health services will be provided.

- *Clinical policy decisions* involve determining criteria to identify who qualifies for specific services.

- *Administrative policy decisions* are concerned with operations, for example where the health services will be located and how they will be offered.

Decision levels have been seen as *strategic*, consequential and far-reaching decisions, *tactical*, medium range and moderate decisions that support strategic decisions, and *operational*, everyday decisions that support tactical decisions (Harris, 2009; Harris, 1998; Heller *et al.* 1988). A relationship between decision levels and organizational chart level has been suggested (Hales, 1993)

> *"Planning and decision-making is consultative and decentralised, relying on information flows which are formal and informal, vertical and lateral. Operating decisions are taken at work group level, tactical decisions at divisional level and both, in different ways, rest upon considerable informal consultation" (p.197).*

Combinations of the two dimensions of goal clarity and procedural certainty have been used to identify four decision modes (Choo and Johnston, 2003) These are:

- *boundedly rational*, where both goals and the procedures to reach them are clear (Simon, 1960)

- *anarchic or 'garbage can'*, where neither goals nor procedures are clear (Cohen *et al.* 1972)

- *process*, where goals are clear but procedures are not (Mintzberg *et al. 1*976)

- *political*, where procedures are clear but there is more than one goal, and/or goals are conflicting or unclear (Allison and Zelikow, 1999).

It has been suggested that health system decision-makers are *naturalistic decision-makers (NDM)* (Baker *et al.* 2004). NDM is characterized by group decisions, time pressures, poorly defined goals, high stakes, the importance of expertise, a focus on assessing the situation over selecting a course of action, and reliance on experience in the form of situation matching and story-telling to anticipate the decision outcome, rather than searching for new information (Lipshitz and Strauss, 1997).

The next part of this subsection looks at literature related to managerial roles.

Managerial Roles

Managers' jobs have been described as open-ended and fragmented, with numerous short tasks and frequent interruptions (Mintzberg, 1973). Health service managers' work has been similarly characterized. An interview study that explored the work of health service managers from perspectives of leadership development, organizational production and psychosocial work environment and stress, characterized it as fragmented and overloaded by many different short tasks (Arman *et al. 2*009).

Generally, managers at lower levels have been seen as dealing with more structured decisions, and managers at higher levels have been seen as involved in more unstructured decisions (Simon, 1960). Organizational decisions tend to be hierarchical, with recommendations passed upward for approval. Authorization to proceed with a decision process may happen in any decision phase (Simon, 1977).

Three sets of ten traditional managerial roles have been identified (Mintzberg, 1973).

- *Interpersonal roles* arise from the manager's position of formal authority in the organizational hierarchy (being the figurehead, acting as liaison with other units inside and outside the organization, and leading the department or service);

- *Information processing roles* involve monitoring information to identify new information relevant to departmental operations, disseminating information from within the department outside, and from outside, within and speaking for the department;

- *Decisional roles* that include activities as improver/changer, resource allocator, disturbance handler, and negotiator.

Moahi (2000) examined health managers' work within these roles and found that participants demonstrated activity across the three sets of roles with less mention of the figurehead role. This analysis contributed to her conclusion that health service managers are like managers in general.

The next part of this section reviews some concepts that may be useful for describing information.

Dimensions of Information

Information can be described by various dimensions, including location, form and category. Considered by location, information may be internal or external, where internal information is generated within the organization and external information comes from outside the company (Krikelas, 1983). Alternatively, internal information has been considered subjective and external information objective (Coleman and Nicholl, 2001; Cohen and Levinthal, 1990).

Information may be in recorded or unrecorded forms (Barry, 2002). Unrecorded information is generally transmitted orally, face-to-face through unscheduled meetings, before, after or during scheduled meetings, in presentations at conferences, through formal visits, or at social events such as business meals or golfing. Unrecorded information can also be transmitted through various communication utilities, by telephone or videoconferencing.

Recorded information may be considered by the following:

- Form of expression, whether textual, numeric, graphical, video, and multimedia (Ercegovac, 2006);

- Format or container, for example: books, journals, scholarly articles, ePrint archives, theses and dissertations, and course management materials (OCLC, 2003);

- Whether primary (narrative, outline, playscript, table, figure and chart, including flowcharts) or secondary (question and answer, troubleshooting or reference, matrix tables, and lists) (Campbell, 1997).

Choo (2006) classified organizational knowledge as explicit, tacit, or cultural. Explicit knowledge is rule-based, so is easy to write down. It may involve policies, guidelines, meeting minutes, union contracts, and position descriptions. Tacit knowledge is acquired through experience and education: this is the unspoken knowledge used by members of an organization to perform their jobs and make sense of their worlds (Polanyi, 1966). Tacit knowledge is hard to verbalize, so is the most difficult form of organizational knowledge to capture. Cultural knowledge is background information incorporating shared assumptions and beliefs about the organizations' goals and capabilities, customers and competitors. It can be used to assign value and significance to new information (Choo, 2006). If it contains taboos, it is less likely to be shared or written down.

Information may also be considered with respect to whether it is primary, secondary or tertiary. Primary information is original information, including the findings as reported by researchers and firsthand accounts of action written by participants. Secondary literature analyzes and interprets primary sources, such as systematic reviews, meta-analysis, textbooks and encyclopaedias. Tertiary sources include bibliographies, indexes, and web links (Boland, 2000).

Information Transactions

LIS researchers (Choo, 1993; Daft and Lengel, 1986) have used the words "information transaction" but a general definition for an information transaction has yet to be identified in LIS literature. Information transactions have not been included in a list of definitions for reference services compiled for the American Library Association (Rabner and Lorimer, 2002). It would be useful for LIS researchers who study information transactions to have a clear definition of the concept.

The American *Uniform Computer Information Transactions Act* (UCITA) defines a computer information transaction with respect to intangible digital goods such as computer software, online databases and other information resources (Gatten, 2002). The concept of information transaction has been used in web analytics and generally understood to be a discrete information exchange between an information user and a web-based information service (U.S. Department of Energy, OSTI Blog, 2009).

In discussion of knowledge management, Huizing and Bouman (2002) defined *information transaction space* as "the set of possible information exchanges available to an actor at a point in time" (p. 185). In the OR/MS, managers' work has been explored by examining the incoming information transactions involved in a single decision over several days (Saunders and Jones, 1990; Jones and McLeod, 1986). Decisions were found to be informed by more than twenty

separate *executive information transactions.* Although the researchers have not specifically defined what they meant by "executive information transactions", they recorded the information and its source as a narrative and then analyzed these several ways, including by classifying them according to Mintzberg's managers' decisional roles and Simon's decision phases (Jones and McLeod, 1986) and by source and media (Saunders and Jones, 1990).

The complexity of workplace information transactions has been suggested (Macdonald, 2006a, Macdonald, 2006b, Macdonald, 2005, Macdonald and Piekkari, 2005; Macdonald and Simpson, 2001) with respect to managers' decisions. Observations included that both information and information behaviour are important parts of information transactions, and that information behaviours may include more than needing information, searching for information and using or transferring information. .

Macdonald's observations do not appear to have been integrated into LIS or other information behaviour research. He suggested that different kinds of information should be shared in different kinds of information transactions. He noted that in the real world, most information is tacit and uncoded and is best shared in informal transactions such as simple conversation (Macdonald, 1998). He recommended that simple conversations and other informal information transactions not be used for highly structured information or situations when order and completeness of information is essential (Macdonald, 1998).

Individual information transactions may include different items of information from different sources. An individual may use many individual sources, each independent of the other, or may gather sources together in a meeting (Macdonald, 1998). Scattered bits of information must be found, acquired and mixed with other information before it can be used (Macdonald, 1998). Information transactions resulting in change mix new information with existing information (Macdonald, 1998).

Macdonald concluded that information transactions are not simply about information transfer (Macdonald, 1998) Technology can effectively transfer information but cannot manage information transactions because it cannot discern whether, or what, information is wanted (Macdonald, 1998). Information transactions involve information exchange where receiving information is as important as giving it (Macdonald, 1998). Both the information giver and the information receiver are actively involved in appraising the information being shared (Macdonald, 1998).

2.4.3 Section Conclusion
This section has summarized research on logic models and theoretical frameworks, as well as other research that may be useful as theoretical frameworks for this study.

The next section explores the literature related to obstacles to information seeking.

2.5 Barriers to Information Seeking

Barriers may arise between identification of an information need and information acquisition and use (Wilson and Walsh, 1996b). LIS researchers are interested in why people stop searching before locating all available information (Mansourian and Ford, 2007; Prabha *et al.* 2007,). This section discusses research on barriers to information seeking that might be similar to those faced by health service managers. It then focuses on the literature related to inappropriate information quantity as a barrier to acquiring and using information, and on theories that influence motivation to search exhaustively for information.

Research has identified barriers to information use by health service managers in Canada, Botswana and Poland. Crisis orientated management, time constraints and a lack of skills are challenges faced by health service managers in Canada that hinder their information access and use (Mitton and Patten, 2004; Mitton *et al.* 2003). Health service managers in Poland face challenges related to their own beliefs and attitudes and skills related to research evidence, infrastructure gaps and problems related to inappropriate format (Niedźwiedzka, 2003a). Leading barriers to information use by health service managers in Botswana included lack of access to relevant government documents and difficulty with getting information from people with the required information (2000).

A study of 205 Canadian health service planners and decision-makers that explored barriers to evidence informed decision-making identified problems with both too little and too much information. Of four factors affecting use of evidence in decision-making by health service managers identified by Bowen *et al.* (2009), two involved inappropriate information quantity. These were lack of data and data overload. The others were lack of systems to track and manage data and lack of capacity and support to search for information. The next section explores the literature on inappropriate information quantity.

2.5.1 Inappropriate Information Quantity

Failure to find and use information has been explored with respect to inappropriate information quantity. On the surface, information poverty, too little information, or else ignorance about information, appears to be at one end of an information quantity continuum, and information overload, too much information or anxiety about too much information at the other, with "enough" information in the middle. Information overload and Information poverty have generally been considered separately in the literature. In his book on information seeking, Case (2007) looked at them consecutively, but separately, in a section on avoiding information. Authors writing on the concepts separately have observed that each lacks a firm definition and that each has been associated with several closely related concepts (Britz, 2004; Wilson, 2001). Goulding

considered these two concepts together (Goulding, 2001), concluding that those suffering from information overload, and the more severe information fatigue syndrome, risk suffering the same fate as the information poor.

Too Little Information and Information Poverty

Fewer publications on information poverty were identified than on information overload and no specific research on organizational information poverty in managers has yet been identified. This part of the literature review, therefore, focuses on information poverty in general. A discourse analysis investigating information poverty within LIS research and practice (Haider and Bawden, 2007) identified 35 papers published between 1995 and 2005. Through *close reading* (a literary analysis technique that uses careful reading, re-reading and analysis to interpret meaning from text), the authors identified four determining factors associated with information poverty. These were:

- *Economic determinism*, i.e. Whether rich or poor;
- *Technological determinism*, i.e. Whether connected to the web or having access to the right tools or skills;
- *Historicizing the information poor*, associated with public libraries' traditional role in providing a way to share information among those without the means to acquire it for themselves;
- the *profession's responsibility and moral obligation* to take action over political or moral concerns, such as censorship or apartheid.

Early work on information poverty (Childers and Post, 1975) focused on people who are socio-economically disadvantaged, which might be considered of limited relevance to managers' information practices. Chatman's studies of well-to-do but marginalized populations (1996; 1991) may be more relevant to health service managers than work on the socioeconomically disadvantaged. Chatman (1996) considered Merton's (1972) sociological theory about insiders and outsiders to develop a theory about information poverty whereby the insider group has privileged access to information and the outsider group does not. Chatman's (1996) six propositions about information poverty appear in Table 2-2. (p. 197).

Chatman's Theory of Information Poverty

Proposition 1: People who are defined as information poor perceive themselves to be devoid of any sources that might help them.

Proposition 2: Information poverty is partially associated with class distinction. That is, the condition of information poverty is influenced by outsiders who withhold privileged access to information.

Proposition 3: Information poverty is determined by self-protective behaviors which are used in response to social norms.

Proposition 4: Both secrecy and deception are self-protecting mechanisms due to a sense of mistrust regarding the interest or ability of others to provide useful information.

Proposition 5: A decision to risk exposure about our true problems is often not taken due to a perception that negative consequences outweigh benefits.

Proposition 6: New knowledge will be selectively introduced into the information world of poor people. A condition that influences this process is the relevance of that information in response to everyday problems and concerns.

Table 2-2 Chatman's (1995) Theory of Information Poverty

Britz (2004) took an even broader perspective with less emphasis on people who are socio-economically disadvantaged. He defined information poverty as

> *"The situation in which individuals and communities, within a given context, do not have the requisite skills, abilities or material means to obtain efficient access to information, interpret it and apply it appropriately. It is further characterized by a lack of essential information and a poorly developed information infrastructure" (p. 192)*

Britz (2007; 2004) outlined the main variables of information poverty as listed in Table 2-3. These may be even more appropriate for considering managers' information situations than those of Chatman (1996).

Information poverty is:
- related to the inaccessibility of quality, relevant and suitable information;
- co-determined by the absence of a well-developed, well maintained and user-friendly information infra structure ;
- closely linked to the level of education and literacy, particularly information literacy;
- determined by the attitude/approach towards information and the use thereof as well as the understanding of the value that can be attributed to it;
- a global phenomenon, but can also occur within the same community and context;
- related to a lack of material and other means to access information; and
- not only an economic occurrence, but has an important bearing on the cultural, political and social spheres of society (Britz, 2004 :197).

Table 2-3 Britz' (2007) Variables of Information Poverty (p. 76)

Too Much Information and Information Overload

Information overload has a longer research history than information poverty, dating back to the early 1900s when the world began to change from an industrial to an information-based economy (Tidline, 1999). Feather (2004) noted that the point of information overload occurs when

information accumulates until there is so much that it is no longer possible to effectively use it (p. 111)

Information overload has been defined at both personal and organizational levels. At the personal level, it is has been defined by Wilson (2001) as:

> *"...a perception on the part of the individual ... that the flow of information associated with work tasks is greater than can be managed effectively, and a perception that overload in this sense creates a degree of stress for which his or her coping strategies are ineffective (p. 113)*

At the organizational level, Wilson (2001) described information overload as

> *"...a situation in which the extent of perceived individual information overload is sufficiently widespread within the organization as to reduce the overall effectiveness of management operations" (p. 113).*

Extreme information overload has been labelled *information fatigue syndrome* (Goulding, 2001) said to cause

> *"…paralysis of the analytical capacity, constant searches for more information, increased anxiety and sleeplessness, as well as increasing self-doubt in decision-making leading to 'foolish decisions and flawed conclusions" (p.109)*

In the most current and comprehensive work on organizational information overload identified by this review, Iastrebova (2006) demonstrated its impact on system performance using work completed by Iselin (1990) who determined that too much information can result in poorer decision quality. Iselin (1988) defined cues to support a decision in terms of the quantity of *different* dimensions (for example, information on time, information on cash flow and information on cost) and quantity of *repeated* dimensions (for example, information on five time periods, or information on five cash flows). Iastrebova (2006) used these dimensions to demonstrate that organizations have reason to be concerned about information overload. She observed a positive relationship between quantity of repeated dimensions and decision accuracy to a certain point.

She also reported a negative relationship between quantity of repeated dimensions and time needed to make a decision, once again to a certain point (Iastrebova, 2006). With increased quantity of different dimensions (different kinds of information cues), more time was required to make a decision with poorer decision accuracy. If information continued to be provided, decision quality declined and the time needed to make the decision increased.

Iastrebova concluded that personal, situational, and contextual factors are key contributors to organizational information overload, and from the literature, identified characteristics of information overload (Table 2-4).

Information overload:

The state in which the volume and speed of incoming stimuli with which an individual has to cope (i.e. information load) is beyond his or her processing capacity (Hiltz, Turoff, 1985).

The decline in user performance due to the assimilation of additional information (Casey, 1980).

The failure to achieve a balance between the information processing requirements of the task and the information processing capacity of the unit (O'Reilly, 1980).

The decrease in task performance following an initial increase as a function of increasing information load (Hahn, Lawson, Lee, 1992).

The state when the information processing demands on an individual's time for performing interactions and internal calculations exceeds the supply or capacity of time available for such processing (Schik, Gordon, Haka, 1990).

The receipt of more information than is needed or desired to function effectively and further the goals of an individual or organization (Losee,1989).

The condition in which the information processing requirements exceed the information processing mechanisms available, so that the organization is unable to adequately process information (Schneider, 1987).

Table 2-4 Iastrebova's (2006) Compiled Definition of Information Overload (p.62)

Information overload in academic researchers has been described with respect to their difficulty keeping up-to-date in their fields (Wilson, 1983). Unlike information poverty, there is a body of research on organizational information overload (Eppler *et al. 2*004; Edmunds and Morris, 2000) and articles that discuss information overload in health service managers (Hall and Walton, 2004; Wilson, 2001).

Five groups of causes were identified in organizational information overload (Eppler and Mengis, 2003) These were *personal factors*, such as senders failing to screen outgoing information well enough*; information characteristics*, including increased diversity of information; decreased information quality and relevancy; *task and process parameters*, including decreases in routine work and increases in interdisciplinary and collaborative work; *organizational design factors* such as bottlenecks that come with centralization; and *information technologies* such as e-mail, lower duplication costs and faster information access. The same report (Eppler and Mengis, 2003) listed twenty-five symptoms of information overload, including inefficiencies in searching for, analyzing and managing information, delayed and inferior decision-making and personal stress and dissatisfaction.

Three recent studies suggest too much information is more likely a problem for managers in general than too little. A survey of over 1,000 managers in large profitable American and British companies (Accenture Information Management Services, 2007) determined that the ever-

increasing amount of information flooding the workplace, e.g. via e-mail, instant messaging systems and the Blackberry, was the most important reason participants experience difficulty with information. A LexisNexis survey of 650 American white collar and knowledge workers across 23 sectors (WorldOne Research, 2008) found virtually every industry being adversely affected by information overload. It was a particular concern in the legal sector where almost 80% of participants reported being increasingly overloaded with information. Neither study referred to managers not having enough information but the Accenture (2007) survey participants noted that it was easier to get information about their competitors than about their own companies. A survey of 124 managers in Australia, Hong Kong, United States and the United Kingdom identified too much information as the leading factor in information overload, followed by difficulty managing information, irrelevance or unimportance of most information, lack of time to understand information, and multiple sources of information (Farhoomand and Drury, 2002).

2.5.2 Information Saturation and Enough Information

Data saturation is a concept in qualitative research understood as the point at which the researcher stops collecting data because no new knowledge is being gathered. In discussion of the state of selecting sources to inform a decision, Saunders and Jones (1990) mentioned a *saturation effect*:

> "that may occur if the decision-maker obtains all relevant information from the accessible source after a few initial contacts early in the decision-making process. Additional contacts with this source may appear obviously unfruitful" (p. 39)

Mansourian *et al.* (2008) described a *search saturation point* as the point at which the searchers were able to satisfy their search aims (p. 412). They noted that the saturation point differs from search to search and would be higher for a literature review than a search for facts, for example cost of materials.

Some authors refer to information saturation in a way that appears interchangeable with information overload (Choo, 2002; Wilson, 2001). It may be that information saturation depends on prior knowledge of a subject but this is not clear from relevant research identified. Research on "enough information" with respect to information seeking (Berryman, 2006) has considered stopping rules used to determine when to stop searching. The relationship between "information saturation" and "enough information" is not clear. It is important to be aware that these ambiguities in the literature of saturation may refer to either of the two different concepts, "too much information" or "enough information".

Theories of Enough Information

Theories associated with why people stop searching or how they determine that they have enough information to support a decision include *Mooers' Law of Retrieval Systems* (Mooers and

Mooers, 1996), *Zipf's Law of Least Effort* (Poole, 1985), and *Simon's Satisficing Theory* (Simon, 1956).

Simon (1957) described *satisficing* as "finding a course of action that is good enough" (p. 204). Satisficing has been recognized as a common practice in real world decision-making (Berryman, 2008) where it has been linked with the *singular evaluation approach* (Klein, 1998). It has been described by Brown (2004) as *"*a decision that satisfies and suffices … satisfactory sufficiency*"* (p. 1241) and by March (1994) as "less a decision rule than a search rule" (p. 27).

Simon's early work on satisficing concerned managers and professionals working in business and government organizations. LIS research includes work by Zach (2005) that found that American arts administrators satisficed when they had just enough information to be comfortable when making a decision and not enough time to search further. Satisficing has been discussed with respect to health services decision-making (Grant *et al.* 2004) although no specific research has been identified. Other LIS work on satisficing includes work on environmental activists (Savolainen, 2007) who "stop information seeking at the point where a good enough solution has been found with regard to their information needs or interests at hand" (p. 619) and on teenage web searchers (Agosto, 2002). It is not clear whether these studies of individuals expand on or deviate from Simon's concept of satisficing where quality and cost are balanced in the best interests of the organization.

Mooers' *Law for Retrieval Systems* observed that finding and using information can be painful and troublesome, and that finding, reading and understanding new information consumed time and effort at the expense of quickly producing and completing work. Work based on new information may conflict with earlier work or decisions so may make more work. Mooers further observed that if people are rewarded for an action they will repeat it; therefore, if they do not use information and are rewarded they will continue not to use it; if they use information and are rewarded they will continue to use it (Mooers and Mooers, 1996).

Within LIS, Zipf's Law has been applied to information seeking as the *Law of Least Effort* (Poole, 1985) which suggests that people invest little in seeking information, preferring easy-to-use accessible sources over sources that are higher quality but more difficult to use or access (Robertson, 1996).

In their review of information issues and problems, Bawden and Robinson (2009) describe satisficing as a coping mechanism for information overload where just enough information is taken to meet a need so as not to become overwhelmed by all of the information available. The authors distinguish between g*ood satisficing* defined as clear rationale in making decisions and choices when the full spectrum of options may not be known, and *bad satisficing,* defined as information avoidance or information selected at random.

In LIS, Simon's satisficing (balancing cost with quality to achieve an outcome that is good enough rather than spending resources to achieve what may be incremental improvements) has been likened to Zipf's Law (people will spend as little effort as possible looking for information) by an LIS researcher (Bates, 2005). However, Zipf's law may have more in common with Mooers' Law (if finding and using information is more trouble than not finding and using it, then people will do without it) as each takes a *Theory X* perspective, people are inherently lazy, dislike work and will avoid it if they can (McGregor, 1960). Zipf's Law, Mooers' Law and Bad Satisficing (2009) appear to share a common perspective.

In balancing cost with real information need to achieve a good outcome, Simon's satisficing takes a *Theory Y* perspective, that people naturally enjoy working and, given responsibility, will do their best and so may have more in common with Good Satisficing (2009).

Managers' search and decision situations have been described as less than ideal, where if questions are asked, data to answer them may not be available, so action is taken before goals are identified and then interpreted retrospectively (Choo and Auster, 1993). Simon's satisficing, originally conceived from research on managers and organizations, has been used in LIS research studies of scholars (Mansourian *et al. 2*008; Mansourian and Ford, 2007; Adamson *et al.* 2006; Connaway *et al.* 2006) with more recent work focusing on scholars' web searching. More work is needed to isolate aspects of satisficing that contribute to its whole definition to determine those behaviours that are satisficing (balancing cost with outcome), those that represent least effort (laziness), and those that are common sense.

2.5.3 Section Conclusion

This part of the literature review highlighted research that may increase our understanding of the obstacles health service managers may face in finding and using information. These relate to inappropriate information quantity and inadequate information management infrastructure and might explain why they satisfice, make decisions without all of the information they need. While there is some understanding of the way that managers use information and experience information poverty and overload, very little LIS research has examined these issues among managers.

It would be useful to identify what finally prompts an information search action on potential needs, or the point at which information accumulated through passive search prompts a health manager to recognize accountability for considering what might happen if active search action is not taken, or what prompts the need to purposefully gather more information.

No research has explained how health service managers identify organizational information needs or how these are differentiated as a potential opportunity, problem or crisis; or how and whether potential information needs are systematically monitored.

2.6 Information Sharing

Few LIS studies have attempted to define and explore information sharing and its relationship to other types of information behaviours (Bao and Bouthillier, 2007). A review of information sharing and related literature published over the past forty years (Wilson, 2010) included the observation that only a small amount of the work has been in the information sciences, with most of the current information sharing research being done in management and information systems.

Managers may accumulate information and manage it in cognitive "savings accounts" to draw upon when a situation presents itself so they can quickly make a decision without having to do an active search (MacKenzie, 2003a). A description of information sharing from the management sciences suggested that when information is shared orally, the information giver actively listens to those who need the information it in order to determine what, from their own store of information, was likely to be of use to the receiver. Further, that when participants in a conversation knew each other well, they were more likely to know the information each other could use (Macdonald, 1998). Similar elements have been included in a definition for information sharing from the communications literature (Clarke, 1973) that differentiated the behaviour from information seeking

> *"We begin by distinguishing two familiar kinds of communication behavior. One is information seeking that is directed toward sources outside social systems of which one is a proximate member. Use of the mass media and expert institutionalized sources are the most common examples. In this communication mode, the individual usually recognizes that the source he approaches has more to tell him than he has to tell the source-hence, the term information-seeking".*

> *The second is information sharing. Here the communication mode is usually interpersonal and within social systems where members have direct contact with one another. Verbal and nonverbal information is likely to be exchanged rather than simply sought, because (1) it is technically possible to exchange, (2) information is more equally distributed among parties, and (3) the parties have a continued interest in relating to each other" (p. 552).*

In their work on collaborative information behaviour, Talja and Hansen (2006) use existing definitions of information sharing to differentiate between the two behaviours and information giving. Elements in their description of information sharing include that it involved sharing already acquired information through direct information exchanges among those involved in solving a problem. C*ollaborative information behaviour* involves identifying and improving approaches to finding relevant documents, and differentiated from simple *information giving,* described as transfer of information without mutual interests and benefits (Talja, 2002). Information giving may involve passing or providing information on how to find relevant documents and may involve intermediaries such as librarians (Talja and Hansen, 2006; Talja, 2002).

A more recent definition of information sharing (Bao and Bouthillier, 2007) considered the behaviour to be "collaboration between two groups of actors in order to exchange information with the purpose to achieve their individual or common interests" (p.1).

Other concepts related to information sharing include invisible colleges and communities of practice. *Invisible colleges* have been described (Cronin, 1982) as "a simple yet complex bush telegraph system serving the needs of the scientific community" (p. 232). C*ommunities of practice* have been defined as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, 2006).

The remainder of this section considers the literature on aspects of information sharing. The section begins with discussion of factors that motivate information sharing.

2.6.1 Motivation to Seek and Share Information

Information sharing has been described as a natural human activity that supports collaboration and development of social networks (MacKenzie, 2003b). Sharing enthusiasm about content and good feelings associated with helping others have been suggested as motivation for information sharing (Erdelez and Rioux, 2000). Reciprocity is the reason suggested most frequently to explain information sharing among managers (MacKenzie, 2003a). Reciprocity in information sharing between and within organizations has been expressed by Nash's Equilibrium in economics (Myerson, 1999) where each makes the best decision they can, taking into consideration their own needs and the needs of the others in the group. Managers must appear to be friendly, co-operative, and willing to share information so others will reciprocate, and they, in turn, will get the information they need. This co-operative approach to information sharing recognizes the important contribution of informal communication to efficient organizational operations (MacKenzie, 2005; Simon, 1965).

People may be motivated by reciprocity to share information, or it may be a position requirement (Lu, 2007). The next subsection explores positions in organizations with information sharing responsibilities.

2.6.2 Positional Roles in Information Sharing

People may be "culturally certified" by their society's conventions, customs and norms with authority to share information or it may be a position requirement (Lu, 2007). Interpersonal information sources who are regularly involved in information sharing are labelled variously as information gatekeepers, boundary spanners, opinion leaders and knowledge brokers; there are no precise and consistent definitions between them (Lu, 2007). *Opinion leaders* are individuals who are likely to influence other people in their immediate environments (Lu, 2007). *Boundary spanners* are concerned with information exchange between their organization and the external environment (Daft, 1989). Boundary spanners make decisions concerning information gathered,

and may attempt to influence external environmental elements and process (Langford and Hunsicker, 1995).   *Knowledge brokers* bring decision-makers and researchers together and build relationships among them to make knowledge transfer more effective (CHSRF, 2003).

Information gatekeepers are individual members of a group or network who have strong ties to other people both within and outside the group (Allen, 1996). They generally have at least five years of experience in an area and better than average education (Allen, 1977). Dixon (1991) outlined information gatekeeper responsibilities that appear to be parallel to CHSRF defined knowledge brokers' activities (CHSRF, 2003).

People become information gatekeepers through several routes. They may be "nominated" by their peers due to their influence and leadership. Some, by virtue of their experience or education, are recognized as experts or given cognitive authority on a subject. They share information and provide their opinion or advice on that subject within their organization or their professional community. Others may become positional information gatekeepers because of their position's placement allows them to have numerous contacts throughout an organization, or they have been culturally certified due to their position's role and influence in an organization (Lu, 2007).

Information gatekeepers find, filter and link people in a group to unfamiliar, unknown information. They transmit information from different sources and socialize their peers in using it (Lu, 2007). Gatekeepers anticipate future uncertainty or store unstructured stimuli (Krikelas, 1983). Complex tasks that require large amounts of new information in initial stages and reduced information overload at later stages were performed better if gatekeepers played a key role in the process (Lu, 2007) and had related expertise (Gabel and Shipan, 2004). Information gatekeepers have been described as dealing with a broader range of information than boundary spanners, who are said to deal with external information, and knowledge brokers, who deal with research information.

Research on managers by MacKenzie (2003a; 2003b; 2005) has identified information practices that include searching for information unrelated to an immediate need and storing it in cognitive savings banks to help reduce uncertainty and allow them to make immediate decisions and provide information to their fellow managers should the need arise.

Glouberman and Mintzberg have observed that management is not a profession. Managers are often unable to deal with hospital structures determined by professional standards and technology. Hospitals and health services need leaders who can understand and can bridge the different specialties that work within them (Glouberman and Mintzberg, 2001b; Detmer, 2000).

Brown (2001) suggested that knowledge that flows readily within one culture would not flow as easily between two, that it is easier to share information within homogeneous groups and groups with similar practices and overlapping memberships, than within and between heterogeneous groups with members of different backgrounds and position levels.

Findings from a study of managers who coordinate clinical professionals in an operating room environment included that making complex health decisions depended on close proximity to schedules, display boards, lists, and worksheets to support information flow between groups (Nemeth *et al. 2*006). Head's findings related to the more complex information needs of hybrid managers (1996) may be partially reflected in theory proposed by Detmer (2000) who described hybrid health managers as boundary spanners that translate research for and act as liaison between clinicians and managers. He proposed than an investment in special training would contribute to their ability to function in a knowledge translation, knowledge transfer role.

MacKenzie identified differences in information behaviours among different kinds of managers, with those in subordinate roles having more access to information than those less connected at most senior roles. Although no research that has specifically addressed or identified positional information gatekeepers other than hybrid managers, the researcher is aware that positions exist within health services to monitor a subject, to take responsibility for enforcing related regulations, and to translate best practices so they can be understood and applied. The position of medical officer of health is one example. Others take responsibility for areas such as infection control, occupational health, quality, risk, chronic diseases, decision support, health promotion, and injury prevention.

Literature on knowledge brokers acting within health services has suggested that they make knowledge transfer more effective (CHSRF, 2003). The ability to find evidence has been identified as the key to a knowledge broker's success (CHSRF, 2003). Research on knowledge translation has identified targeted messaging as an effective way to communicate with health services workers (Dobbins *et al. 2*007b).

Klobas and McGill (1995) suggested that librarians act as both information sources and information recipients for information technology gatekeepers. The importance of integrating formal library and information services with information gatekeepers and their information networks has been recognized in the literature (Lu, 2007) but no research has been identified that relates to how health librarians might support positional information gatekeepers working in health services more effectively. Research has yet to be identified that examines collaboration between knowledge brokers, librarians and health services workers in positional information gatekeeper roles.

The next subsection explores literature related to translation, transfer and absorption of information and knowledge.

2.6.3 Knowledge Transfer, Knowledge Translation and Absorptive Capacity

Other research related to information sharing includes information transfer, knowledge transfer, knowledge translation and absorptive capacity. *Information transfer* is the function of the information system or intermediary that moves the information from its source to the user (Belkin, 1984). *Knowledge transfer* is the movement of knowledge from one place or group of people to another (CHSRF, 2003)

A*bsorptive capacity* is the extent to which an organization can assimilate and reproduce new knowledge acquired from external sources (Cohen, 1990). Studies of health services organizations' absorptive capacity have determined that research use is more complex and sensitive to organizational factors and processes than indicated by previous research (Belkhodja *et al. 2*007) and that organizational culture is an important factor both in developing absorptive capacity and implementing new technologies (Caccia-Bava, 2006). Information gatekeepers have been linked to absorptive capacity where their role has been described as centralized, that of information monitor and information translator (Cohen and Levinthal, 1990).

Research on knowledge translation and knowledge brokering has focused on academics sharing research information with health decision-makers (CHSRF, 2003; Landry *et al. 2*003; Lavis *et al. 2*003; Innvaer *et al. 2*002, Landry *et al. 2*001, Lomas, 2000b). The specialism of knowledge translation has specifically developed to address the challenges posed to use of evidence by various stakeholders including managers. Challenges in knowledge translation have been identified (Dobbins *et al. 2*007; Landry *et al. 2*006) as has the need for knowledge translation research to be done in real-life situations where decisions must be made quickly and on a sufficiently large scale to allow rigorous evaluation (Lavis, 2006). By 2007, after two decades of study on translating health research to practice, health policy makers in all countries still have difficulty determining which strategies will have the greatest impact on health outcomes (World Health Organization, 2007) There has not yet been clear direction on how best to move toward an evidence-informed health care system (Dobbins, 2007).

Knowledge transfer, knowledge translation and knowledge brokering may differ from internal information sharing because the information giver is external to the organization, separated from the situation without an insider's knowledge of the context. No research has been identified to date as to whether the information giver being an outsider matters to the health services manager as information receiver.

The next subsection discusses the literature on meetings as a mechanism to share information.

2.6.4 Meetings as a Mechanism to Share Information

Much of the literature on meetings appears to have been based on personal experience, observation and opinion rather than research. Topics have included unproductive meetings, improving meeting effectiveness with skilled chairing and facilitation, tailoring meeting format and room layout to group size and meeting purpose, clarity of group purpose, processes and member responsibilities, keeping effective meeting records, and impact of communications utilities.

The role of meetings as mechanisms for information sharing for health service managers has been explored in two studies, one Canadian and one Swedish. The Canadian study (Moss, 2000) used semi-structured interviews, meeting diaries and a focus group to gather perceptions of meeting effectiveness among 24 senior managers in a British Columbia health region. The study identified three types of meetings, paraphrased as follows: *information giving*, where information is given from one individual to others, *information exchanging*, where individuals exchange views on a variety of topics, and *information creating*, where through dialogue and discussion, decisions are made, problems solved and goals formulated (Moss, 2000). The researcher estimated that the health region's 100 managers and senior executives spent a minimum average of 1,500 hours a week in meetings (Moss, 2000, p.3).

The Swedish study used structured observation of ten Swedish nurse managers over 3½ -4 days On average, 59% of their time was spent in meetings, 40% of which were scheduled and, 19% unscheduled (Arman, 2009).

The literature on meetings among managers in general includes dimensions that may be useful in an information sharing study, including scheduled or unscheduled, meeting purpose, meeting type, and length, organizational and individual time spent in meetings, group size and meeting cost (Romano and Nunamaker, 2001; Panko and Kinney, 1995; Panko, 1992). Other work that may be useful in an observational study of group information sharing includes research on information interactions at meetings (Huvila and Widen-Wulff, 2006; Cool and BelkIn 2002), on *information richness,* (Daft and Lengel, 1986) "the ability of information to change understanding within a time interval" (p. 560)*,* and on teamwork and group collaboration (Hutchins *et al.* 2007; Nijhuis *et al. 2*007).

In a study of executive directors, department heads and staff of sixteen social welfare and research agencies (Hage and Aiken, 1971), the researchers identified two types of organizational meetings or "task communications": planned interdepartmental communications, labelled *scheduled communications*; and impromptu, unplanned interdepartmental communications about a new organizational activity, labelled *unscheduled communications* (p. 864). These categories are similar to Simon's structured and unstructured decisions (Simon, 1977) . A positive relationship was noted between unscheduled meetings and organizational diversity with respect to employee and service specialization, diffusion of power, high uncertainty, and non-routine

work situations. A negative correlation was observed between unscheduled meetings and organizations with job descriptions.

After five weeks of observations of chief executives' work, Mintzberg (Mintzberg, 1973) identified five basic media used to communicate and exchange information. These included documented communication (mail) and verbal communication (telephone, scheduled and unscheduled meetings, and tours). This study found that what the information managers found most useful was obtained through scheduled and unscheduled meetings. Scheduled and unscheduled meetings were similar in frequency but differed with respect to membership and duration. With respect to frequency of activities, they had about the same number of unscheduled meetings (19%) as scheduled meetings (19%), but spent more time in scheduled meetings (59% vs. 10%). Sudden problems were often addressed by telephone or in unscheduled meetings with smaller groups of people with whom they worked more closely. Scheduled meetings tended to be with larger groups with whom they worked less closely, more frequently away from the organization.

A study of engineers communicating in a dynamic environment characterized by the combined effect of complexity, uncertainty, and speed (Laufer *et al.* 2008) found that they were successful in "quickly and frequently sharing large and diverse volume of information with a large number of people" (p. 84). The findings included that these construction project managers used verbal communication nearly 80% of the time and spent 60% of their time in meetings, of which 80% were not planned. They also preferred information interaction with no more than one or two other persons.

Most of the research identified considers differences between scheduled and unscheduled meetings but no work has been identified that separates scheduled meetings into meetings of formally named and structured groups and meetings of informal groups, or that examines the differences between these. The next subsection discusses research on transactive memory theory, which may help explain how individuals are identified as information sources.

2.6.5 Group Information Sharing and Transactive Memory Theory

A body of research in the management and psychological sciences on *Transactive Memory Theory* (Wegner, 1986; Wegner *et al.* 1985) has been concerned with how groups work together using knowledge of what members know (Sole and Edmondson, 2002). To function effectively, each member maintains different expertise which other members come to know and trust. When a situation arises, members come together to pool and use what each knows. Effectiveness also depended on each sharing what they know and accept the credibility of what the others know, but they do not have to integrate or share each other's expertise to perform well (Lewis, 2003). Other research on Transactive Memory Theory has determined that more hierarchical groups are

less effective than groups without members who have manager-staff relationships (Cummings and Cross, 2003).

A study of a group of physicians found that unless they were dealing with a particularly challenging case, instead of consulting explicit research-based information sources they obtained information from *mindlines*, "collectively reinforced internal tacit guidelines" in the form of information from trusted interpersonal sources, including tacit information from colleagues and new research information from consultants (Gabbay and le May, 2004). Physicians who participated did not hesitate to challenge each other but did not tend to challenge individuals they recognized as opinion leaders, whether internal or external.

D'Alise *et al.* (2010) considered use of mindlines and knowledge exchange in a study of paediatricians with respect to Transactive Memory Theory and three other theories generated from empirical research.   Results included that the clinicians tended to call on the interpersonal sources that were most familiar to them, regardless of whether the source's specialty matched the information need. This finding is similar to that of MacKenzie (2005) who found that managers preferred other managers as information sources and chose their information sources based on relationships with them rather than their knowledge and cognitive abilities.

2.6.6 Section Conclusion

This section has discussed aspects of information sharing, including motivation to share, positional requirements to share, meetings as opportunities for information sharing, and theories associated with information sharing and transferring research information to practice. Some of the research suggested that information sharing and research uptake increases when the sharing and the transfer occurs between people and within groups who know and trust each other.

The next section explores the literature related to information behaviours and practices that take place once the information has been acquired, shared or transferred.

2.7 Assessing Information for Relevance, Value and Credibility

One of the researcher's initial assumptions was that before health service managers use information, they assess it for relevance, value and credibility. It has been suggested that in information sharing, both the information giver and the information receiver are actively involved in appraising the information being shared (Macdonald, 1998). Although relevance, value and credibility have been studied from different perspectives, there does not appear to be a cohesive body of research in any discipline that suggests how managers assess information. This section considers research that may be useful in considering this aspect of health service managers' information behaviour. The section begins with discussion of relevance.

2.7.1 Relevance

Relevance in general deals with how pertinent or applicable information is to the context of the information need. Davies (2006) has described a "relevance gap" in explaining why managers use little research (p. 1). Either the subjects or the focus have not been relevant to managers' needs. Rather than explanations of why things happen or instruction telling them what not to do, managers need research to provide solutions to their problems in order for it to be relevant. He suggested that more researcher-manager collaboration would improve relevance so that research results would be implemented more often.

Relevance research in information retrieval and information science traditionally has been associated with the design and evaluation of information systems and the effectiveness of search engines (Hjørland, 2010). There has been research on categories of relevance judgment and on users' perceptions of relevance that may be useful for information retrieval systems design (Maglaughlin and Sonnenwald, 2002).

Situational relevance has been defined (Wilson, 1973) with respect to items of information as "those that answer, or logically help to answer, questions of concern*"* (p. 457). The concept of relevance has been considered from a variety of perspectives that appear to be congruent with Wilson's definition of situational relevance; relevance judgement varies according to the situation or task (Borlund, 2003). Determining which items are relevant in relation to a given goal or task requires knowledge of the subject and may vary according to perspective associated with different theories or views (Hjørland, 2010).

No research has been identified on information relevance with respect to time and place, to suggest whether all information on a specific workplace situation or task would automatically be relevant to health service managers or whether only work conducted in similar settings would be relevant. It is not known, for example, whether participants in this study would consider information research conducted in for-profit health systems as being as relevant to their needs as research in publicly funded health systems. Alternatively, research in a single site organization as being as relevant as a multi-site organization, or in a workplace without computer infrastructure as being as relevant as research conducted in an organization with a similar computer infrastructure.

2.7.2 Value

A definition of information value from the management sciences (Jones *et al.* 1994) is "the perceived usefulness of an information transaction/link to the decision-maker" (p. 49). Observations related to information value include that information has no value unless it is useful (Macdonald, 1998) and that information has no scarcity value (Feather, 2004). Instead, there is an apparent paradox in that information becomes more valuable as supply increases. Each additional item increases the value of the information that has already been collected, to the point

where there is so much information that it is no longer possible to use it effectively, then, the value of information drops (Feather, 2004).

Information value has been considered with respect to the resources consumed to use it: cost, timeliness, relevance and uniqueness (Andersen, 2006). Information value has also been examined with respect to its relevance to the consumer, exclusivity from the provider, processing with respect to IT systems' capabilities and means of distribution (Oestreich, 2010). In economics, information derives value from its effect on the decision process (Treacy, 1981). Simon's satisficing theory, discussed in subsections 2.4.1 and 2.5.2, challenged established economic information value models that required exploration of the consequences of every possible action and choice of the one that maximizes expected value of outcomes (Treacy, 1981).

A value of information (VOI) theory was developed from the work of Simon and others in the late 1950s (Cullen and Frey, 1999; March and Simon, 1958). VOI theory uses uncertainty analysis and applications of Bayes theorem to calculate the expected benefit of information versus the cost of acquiring it. Applications of VOI include design of knowledge management systems (Mussi, 2004) and identification of priorities for medical research trials by calculating how the costs and consequences of decisions made with current evidence differ from those made with future evidence that resolves key unknowns (Schmidt, 2010).

Other research on how and why managers value information has emphasized physical aspects of the information or the way it is managed over content. One study suggested managers value information most for its structure and organization (Terblanche and du Toit, 1996) while another found that managers valued information most for its currency and accessibility and least for its cost and format (Hayward and Broady, 1995).

In their research on information that managers use to inform decisions, Jones *et al.* (1994, 1986) asked managers and their secretaries to log information transactions for ten days, and then rate them according to the importance of the information to the decision. Information value varied by managers' decisional role as defined by Mintzberg (1973), with the highest value attached to information received by managers acting in the negotiator role (Jones *et al. 1*994). Managers found internal information more valuable than external information, they preferred verbal over written media and no information source was more highly valued than information from a committee (Jones and McLeod, 1986).

There has been a lack of consensus as to what determines information value and whether context is important. No research has yet been identified that suggests whether health service managers place a consistent information value on different types of information, or assign value

depending on the context in which it is needed, or whether value, once assigned in a specific situation can change.

2.7.3 Credibility

Established mechanisms for assessing credibility of published written information include peer review and editorial boards that draw on expertise to filter out information that is subjective and unreliable, leaving objective, reliable information (Bauer, 1992; Kerr, 1970). In evidence-based practice, well-defined approaches are used to critically appraise clinical studies (Guyatt and Rennie, 1993).

Mechanisms for assessing information shared orally are less clear. Research from several disciplines may help us to understand how health service managers assess the credibility of their oral sources. Research on transactive memory theory, discussed above, has also considered the nature of credibility and how credibility is established in organizational groups (Lewis, 2003). Teams that perform well have differentiated expertise, trust each other's credibility and agree on who knows what to coordinate task processes (Lewis, 2003). Teams that do not perform well may have inadequate expertise or may not rely on each other's expertise or may fail to recognize how members' knowledge fits together, and then develop redundant knowledge instead of diversifying expertise and deepening individual expertise (Lewis, 2003).   The rest of this subsection considers expertise and related concepts.

People seen as credible sources of information may be experts on a subject, or may be seen as knowledgeable in a subject and awarded cognitive authority by their peers. Cognitive authority is different from administrative or hierarchical authority (Wilson, 1983) which recognizes a position's power to "tell others what to do" (p. 14). Expertise and cognitive authority are similar in that each relates to a sphere of interest so that a person with expertise or cognitive authority may speak with authority on some questions and not on others. Cognitive authority differs from expertise in that people can be experts but be unrecognized. In addition, cognitive authority can be recognized in people in varying degrees – people can have a little or a lot of it. Development of expertise involves achieving milestones and concrete demonstrations of achievements (Reih, 2005; Wilson, 1983)

Although not always viewed uncritically (Sackett, 2000), experts traditionally have been expected to learn from their experience, have considerable knowledge about a subject, be able to apply it appropriately (MacCrimmon and Wagner, 1987) and contribute more to group decision-making than non-experts (Gabel and Shipan, 2004). Dreyfus and Dreyfus (1986; 1980) identified a model of skill development whereby a learner depends on concrete experience and intuition as they pass through five stages. These are novice, advanced beginner, competent, proficient and expert. This perspective on expertise has been applied to nursing by Benner (1987).

Experts	Novices
Focus on unusual events and use fewer cues than novices	
Take a wide view of the problem and then separate it into smaller parts	
Take a breadth first approach to information searching	Take a depth first approach to information searching
Have better organized information search strategies than novices	
Are more successful at identifying relevant information than novices	
Categorize problems using high level knowledge	Categorize knowledge using objects and situations
Follow a more goal driven strategy than novices	
Use backward reasoning to pick up missed information in the problem statement	
Ask more questions than novices	
Is discouraged by too much information, and will ignore the system	Performance may be impaired by not enough information

Table 2-5 Differences between the information behaviour of experts and novices constructed from Grant, *et al.* (2004, p 212).

Louis (1980) identified three differences between newcomers to an organization and more experienced staff. More experienced staff normally knows what to expect, use history to accurately interpret or make sense of them the unexpected and compare perceptions and interpretations with other insiders (Louis, 1980). Newcomers to an organization do not have these same resources. In their review of health decision-making, Grant, *et al.* (2004) considered differences between experts' and novices' decision-making and information search strategies (Table 2-5).

It has been suggested that people underestimate the value of what they do not know and overestimate the value of what they do know (Bates, 2005). In cultures of oral information sharing, it may be that the greatest risk lies in unknown unknowns (Choo, 2002; Witte *et al.* 1998; Witte *et al. 1*989). Research has yet to be identified on differences between experts and novices as information givers, whether novices lack the ability to assess their own credibility, or as information receivers, lack the ability to assess the credibility of those who give information to them.

2.7.4 Section Conclusion
This section has considered issues important to oral information sharing where information receivers do not have the benefit of editorial boards, peer review or critical appraisal to filter information for them. Research has not yet been identified on the comparative value of relevant information, or that explains how health service managers, or any managers, go about assessing

the oral information they receive or whether and how managers assess their own credibility and fitness to share information.

2.8 Chapter Conclusion

This literature summarized existing research that may help understand the information behaviour of health service managers, their use of information to inform workplace decisions, and obstacles that prevent their use of research evidence.

Studies of health service managers carried out in the United Kingdom, Botswana, Poland, United States and South Africa Head (Kovner, 2005; Niedźwiedzka, 2003; Mbananga and Sekokotla, 2002; Moahi, 2000; Head, 1996) over the past 15 years identified similar information-related barriers and challenges. These included inadequate information management infrastructure, poor data quality and internal information either not available, or not available in a usable form. In addition, common across studies was that the health service managers relied on internal information and preferred to acquire their information orally to consulting primary research articles.

No research was identified that described what kinds of decisions health service managers make, what steps they take in making these, whether they used different kinds of information at different points in the decision process or how they acquired the information they used. No LIS research was identified that determined the dominant information behaviour of health service managers generally, or whether there were different behaviours associated with working in different environments, publicly or privately funded, single or multi-site, computerized or not.

The literature on workplace information sharing identified reasons that motivate sharing behaviour, and characteristics of positional roles such as information gatekeeper. The literature on meetings, though fragmented and more often derived from opinion and experience than research, may help explain the practices of the health service managers participating in this study.

Other research explored in more detail included inappropriate information quantity as a barrier to effective information use, and assessing information for relevance, value and credibility. Although no research on health service managers had been identified, work on other groups will be used as an exploratory framework for this research.

The one information behaviour model developed with reference to health service managers described only information seeking behaviour. There was no research found that explained how health library services might best support health service managers or information gatekeepers.

One observation arising from review is that the two bodies of work, LIS and OR/MS are complementary. Library and Information Sciences research focuses on acquiring information with less emphasis on understanding the needs that gave rise to it, and its use to solve problems or make decisions. Operations research and the management sciences focuses on using, comparing and evaluating information with less emphasis on its source and how it is acquired.

The question that initially gave rise to this research sought to identify the optimal point in a health service manager's decision at which information to support population health planning might best be considered. The literature review did not suggest an answer to this question.

At the conclusion of the literature review, the following four research questions were identified:

1) Why do health service managers need information in their work?
2) How do health service managers approach getting the information they want or need?
3) What information do health service managers need and use?
4) What information issues and problems do health service managers face?

The next chapter elaborates on these four research questions and then discusses the rationale behind the design and methods chosen for this research.

Chapter 3 Methodology

3.1   Introduction

Methodology is the science and study of methods (Grix, 2002). Discussion of research methodology includes a description of the research need, the logic of scientific inquiry and the potentialities and limitations of particular techniques or procedures used to meet the particular research need (Grix, 2002) and any theories or concepts associated with them.

This research was initially prompted by the need to understand health service managers decision processes so that information to influence population health planning could be made available to them at the appropriate time. At the conclusion of the literature review, when four questions about the information behaviour of health service managers remained unanswered, it became clear to the researcher that relevant research to support delivery of library services to health service managers did not yet exist. The main aim of the research then became to develop an in-depth understanding of the workplace information behaviour of health service managers.

The methods initially considered for this research evolved in response to emergent findings and further questions. The First Interview Study findings informed the design of the Calendar Study. Both the First Interview Study and the Calendar Study informed design of the Second Interview Study. This Chapter begins with a statement of the problem and then describes choice of methods in general, and with respect to their suitability for use in this particular study.

3.2   The Research Problem

LIS researchers have noted that librarians designing library and information services and acquiring information resources for workplace use must first understand the needs of the groups who will use them:

> (Wilson, 1981) *"..the search for determining factors related to needs and information-seeking behaviour must be broadened to include aspects of the environment within which the work-role is performed"* (*p. 685).*

> (Leckie et al, 1996) *"In order to investigate the information-seeking behaviors of professionals, the broader working context in which professional practice is conducted must be closely examined and understood"* (p.179).

There has not been enough research to support or justify design and development of library and information services for health service managers, or to allow robust comparisons with other groups that have been the subjects of information behaviour research. Whether health service managers were more similar to health care clinicians, to scholars studying, teaching or

conducting research in health fields, to managers in general or to members of the public remained unknown.

3.2.1 Research Questions

Types of research questions include descriptive, developmental, mechanical or process, causal/predictive and comparative. The differences between these include whether they begin with "who?", "what?", "where?", "how many?", or "how much?" (Mason, 2002).

Descriptive questions ask 'What is happening?" and invite various kinds of accounts that will characterize a population, lead to understanding the scope and severity of a problem, help develop a theory or conjecture or identify change over time and associate variables (Shavelson and Towne, 2002). Developmental questions ask, "How or why did something develop?" (Mason, 2002). Process or mechanism questions ask, "Why is it happening?" and "How is it happening" (Mason, 2002); mechanical questions ask, "How does something work?" (Shavelson and Towne, 2002). Answers to process and mechanism questions can be used to model how various parts of a complex system fit together and explain conditions that impede change (Shavelson and Towne, 2002). Causal/predictive questions ask, "Does x cause y?" and "Is there a systematic effect?" (Mason, 2002) and "What influence does one thing have on another", or "What causes something", or "What is the likely outcome of an effect on something" or "Why does it work this way". These can be used to understand the effect of an intervention or strategy on an outcome (Shavelson and Towne, 2002). Comparative questions ask, "What are the similarities and/or differences between two or more things" (Mason, 2002).

This exploratory research will initially ask descriptive questions. The main broad research question for this research was "What are the information needs and uses of health service managers?" This question was framed as four more focused questions at the end of Chapter 2. These are further explained as follows:

1) Why do health service managers need information in their work? Answering this question would provide an understanding of situations in their workplace that gave rise to information needs.

2) How do they go about getting the information they want or need? An answer to this question would identify their dominant information behaviour, whether it is represented by existing models, and perhaps determine when information is used in their decision processes.

3) What information do they need and use? An answer to this question should identify the information they use to solve problems and make decisions, how new research based

information enters the organization, and how they assess information for relevance, value and credibility.

4) What are their information issues and problems? An answer to this question should identify barriers and challenges healthcare services managers face in accessing and using information.

The researcher expected that by answering these four questions in sufficient detail, results would allow comparison of the information behaviour of healthcare services managers with other more studied groups, and so answer the secondary question, "What information seeking models best represent the information needs of this group?"

3.3 Study Design

The initial study design for this research was developed with attention to five core concepts of social science (ontology, epistemology, methodology, methods and sources) (Grix, 2002) and answers to five interrelated questions important to research study design (Mason, 2002). These have been summarized in Table 3-1 and discussed in below in this Chapter.

Question	Perspective	Study Design Consideration
What do we know?	Ontological Perspective (Grix, 2002); Mason, 2002).	Objectivism: That decisions are made in health services.
How do we know this?	Epistemological Perspective (Grix, 2002, Mason, 2002).	Naturalism: Because progress is made, problems are solved and work is done.
What broad topic is the research concerned with?	Broad topic (Mason, 2002)	Health service managers' workplace information behaviour
What will this research explore?	Intellectual Puzzle (Mason, 2002)	Descriptive questions: Why they need information and how they go about getting it
Why do this research?	Research Aims and Objectives (Mason, 2002)	To know; To design better information services that will improve uptake of health research
Is the question "How well" or "How much"? Do we need to explore & describe, explain, evaluate, or generate theory?	Methodology (Grix, 2002)	Qualitative contextual, explore and describe
How will we collect the data?	Methods (Grix, 2002)	Interviews
What are the data sources?	Data Sources (Mason, 2002)	People
What will be analyzed?	Units of Analysis (Yin, 2002)	Transcripts of individual interviews

Table 3-1 Summary of key factors in initial study design (Grix, 2002, Mason, 2002)

Research design and data gathering were influenced by two of the researcher's fundamental philosophical beliefs about the research subject. The first of these was *ontological perspective,* what the researcher believed or assumed to be true about the research subject. The second

was *epistemological perspective*, how a researcher came to know what they knew to be true of the research subject.

In the social sciences, *Naturalism* is the dominant approach. This has been the researcher's epistemological perspective for this research. Naturalism (Kincaid, 1998) is "the belief that social phenomena are part of the natural world and accordingly amenable to the methods of the natural sciences"' (p. xv). Naturalism involves the study of knowledge. It is related to positivism but differs from it in that positivism uses experiments and other controlled situations to study a situation while naturalism maintains that social processes should be studied in their natural setting. In contrast to positivism*, interpretivism* sees that the differences between people and research subjects from the natural world support research methods using subjective interpretation of social action (Bryman, 2001).

For this research, the researcher has attempted to maintain a detached, objective position (Bryman, 2001) reflecting belief that the "social phenomena and their meanings have an existence that is independent of social actors" (p. 16). This perspective contrasts with *constructivism* (Bryman, 2001), where a researcher builds the reality from both their own and the research subjects' actions, perceptions and experiences; things are "true because someone thinks it is…not only produced through social interaction but … in a constant state of revision" (p. 16).

3.3.1 Research Approach and Data Sources

Social sciences methodology can be split into qualitative and quantitative approaches (Fox *et al.* 2001). Choice between these depends on the research requirements. Quantitative approaches are more often used in hypothesis testing, causal explanations, generalization and prediction while qualitative methods are more often used to develop understanding, rich description and emergent concepts and theories (Snape and Spencer, 2003).

Qualitative methods have been used both as preliminary research before a quantitative study, and after quantitative surveys to determine plausibility (Cahill, 1996). While a survey would allow broad surface patterns to be identified in a group of participants (Mason, 2002), little LIS research had been completed with this group, so exploratory research was required first.

The function of qualitative research can be contextual, explanatory, evaluative or generative (Ritchie, 2003). The main purpose of *contextual* research (Ritchie, 2003) is to "explore and describe participants' understanding and interpretations of social phenomena in a way that captures their inherent nature" (p. 28). This research required an exploratory approach that would lead to a deep understanding of information behaviour in a group not well studied or understood.

Approaches to research logic may involve inductive, deductive or abductive reasoning. The *inductive* research approach begins with observations and then generalizes to develop theory. The *deductive* approach begins with an established theory and tests it to see if applies in specific instances. The *abductive* approach explores or describes an effect and then uses reasoning to explain the cause and induction to develop theory (Spens and Kovács, 2006). Qualitative research was most appropriate for an exploratory and descriptive study using an abductive research strategy.

Due to the nature of their work and issues related to patient and client privacy, observing these health service managers in the course of their daily routine, with or without video recording for later analysis, would not have been practical. No collection of written documents were identified that would provide insight into their information practices.

Qualitative research may also have a *generative f*unction*,* to aid in the development of theories, strategies or actions (Ritchie, 2003). With few research articles on the information behaviour of health managers, concepts related to the research study have not been tested well enough to develop a hypothesis. Rather than beginning with a hypothesis, this research study would need to use information gathered through the literature review and the interviews to develop explanations or propositions for further inquiry.

Interviewing is a commonly used qualitative research method, chosen by researchers according to their philosophy about research and their view of research participants and the kind of interaction they prefer to have with them (Mason, 2002). This researcher's ontological position was that health managers' perceptions, experiences and interactions are sufficiently meaningful for this research to explore. Her epistemological position is that qualitative interviewing allows a legitimate way to generate data (Mason, 2002). The researcher also sees the knowledge of these health service managers as situational so she planned interviews as social interactions about information and information behaviour rather than about the problems that prompted the information need. Interviews would allow the researcher to be active and reflexive in developing a deep understanding about participants in focused areas.

The data that interviews could generate was not available in any other form. For these reasons, people – the health service managers – were identified as the most appropriate data source for the First Interview Study.

3.3.2 Reflexivity
This study was initially framed by the researcher's own belief and assumptions (Section 1.2.3). From a naturalistic point of view, the researcher had been the library services manager for 10 years so although not a research subject, was already an insider as a service provider. As a member of the Annapolis Valley Health Leadership Team, the researcher had been regularly

engaging with other managers in meetings for some years. Appointments for research interviews would meet the need to differentiate between engaging with them for research and engaging with them in the course of regular health service operations.

To help ensure ontological and epistemological consistency throughout this research, the researcher was required continuously to practice *reflexivity,* defined as (Nightingale and Cromby, 1999) how to "explore the ways a researcher's involvement with a particular study influences, acts on and informs such research" (p. 228). *Reflexivity* and practicing reflective acts during the research process (Mason, 2002) means "thinking critically about what you are doing and why, confronting and often challenging your own assumptions, and recognizing the extent to which your thoughts, actions and decisions shape how you research and what you see" (p. 5).

This thesis only includes the findings from this research.   If data gathered did not include specific phenomenon, they were not included in the findings. However, the researcher's own background and experiences has influenced interpretation of the findings and required that the researcher practice reflexivity by critically questioning how she produced and interpreted new knowledge and how she related that new knowledge to what she already knew about the research subjects' reality.

3.3.3 An Overview of the Research Design Process

The aims of this research were to investigate information behaviours among health service managers and to identify whether any information seeking models represented their behaviours. These research aims reflected an assumption that health service managers' dominant information behaviour was information seeking, perhaps due at least in part because prominent LIS information behaviour models tend to represent information seeking. Had the interviews chosen as the means of gathering data for Part 1 of this research (Point A in Figure 3-1) resulted in a deep understanding of participants' information behavior, Part 2 of the research would have been a questionnaire to determine whether these behaviours could be generalized to a larger group of health service managers.

The First Interview Study results suggested that information sharing was more important to participants than information seeking and failed to provide an in-depth understanding of participants' information behaviours to be followed up by questionnaire. At this stage and at each step in the research that followed, the complexity of participants' information behavior
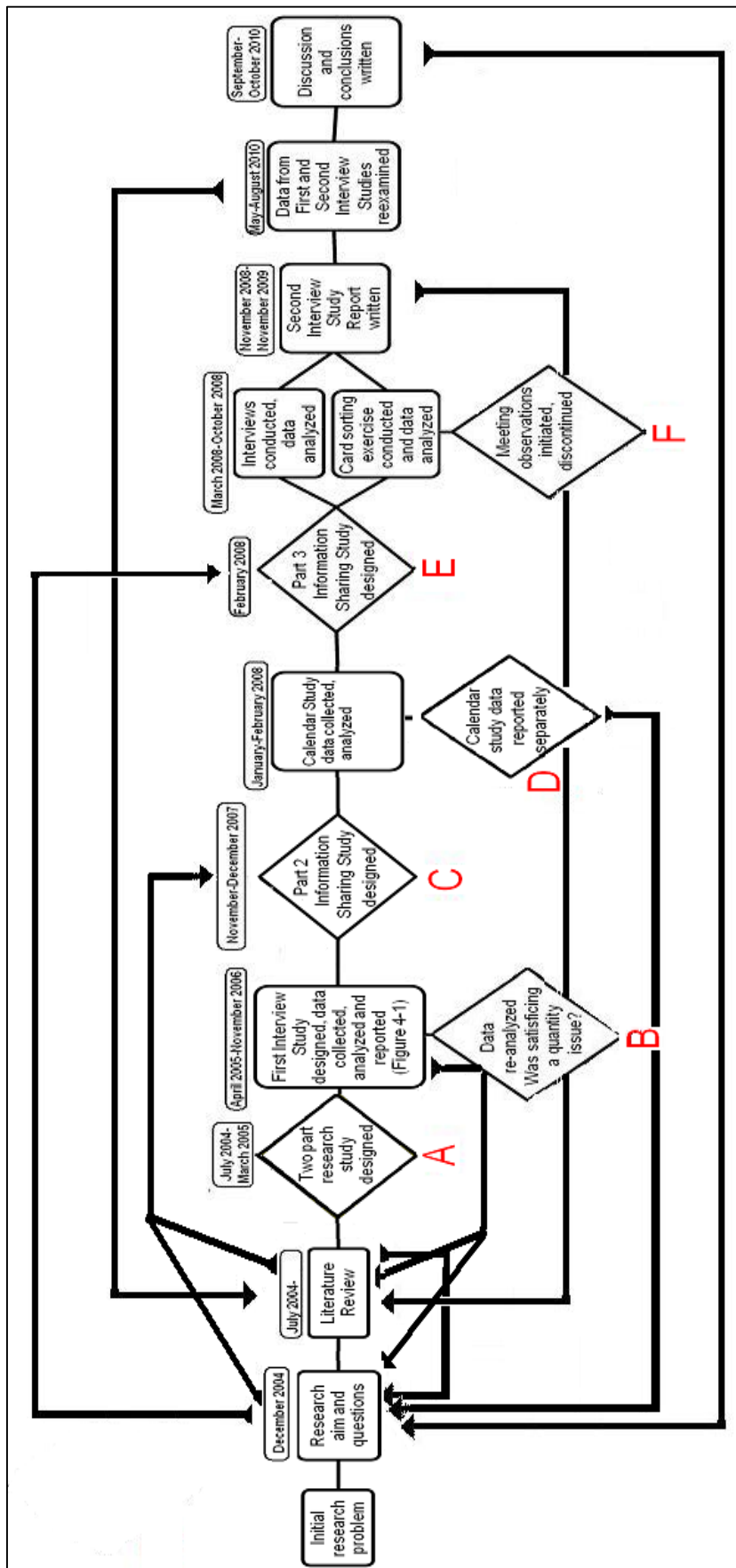
Figure 3-1 Diagrammatic Overview of Research Design/Redesign Process

became more obvious. It became necessary to stop and refocus, first try to take a broad overview of results and then try to drill down in one or more areas to find out exactly what was happening. Consequently, changes to research design were ongoing over the course of this study. These are represented by decision diamonds in Figure 3-1.

Data gathering changes involved replacing the questionnaire study with an Information Sharing study (Point C in Figure 3-1) that would include a calendar study, a second series of interviews, a card sorting exercise, and a series of meeting observations. After Calendar data were analyzed, a decision was made to report results separately (Point D in Figure 3-1) with study results used to refocus the revised Information Sharing Study (Point E in Figure 3-1). Then, because they produced data on information and information behavior that was too rich for a smaller follow-up study, eliminating meeting observations from the Information Sharing Study (Point F in Figure 3-1), and relabeling that study as the Second Interview Study.

Data analysis changes included replacing inadequate coding systems, re-analyzing data and replacing simpler for more complex approaches and vice versa, as follows:

- The coding system developed to analyze First Interview Study results for information and information seeking behaviour was replaced with a new indexing framework developed for knowledge.

- After First Interview Study data were analyzed, a second pass was made through the interviews to see whether comments suggested a relationship between the satisficing and inappropriate information quantity (Point B in Figure 3-1). The process raised questions for the Second Interview Study.

- Social network analysis mapping proved not to be a productive way to analyze card sorting exercise data so results were presented as simple counts.

- Indexing Second Interview Study data did not produce very different results from the First Interview Study so a new approach was developed to map interview transactions to allow quantitative within and between case analysis.

Although the iterative nature involved in designing this was not the planned approach, moving between study results and the research literature at each step was more effective in accomplishing research aims than the original study design could have been. The final design, a three part study, with each part arising from and building on the previous part, brings new clarity to what is known about the information behavior of health service managers.

3.3.4 Section Conclusion

This section has discussed the concepts and questions that influenced the design of this thesis research and provided an overview of rationale for design changes that occurred during the research study. The next section describes the specific methods used to gather data for this research.

3.4 Data Gathering Strategies

Once a decision was made to conduct qualitative interviews of health service managers and analyze interview transcripts, the next step was to determine the specific qualitative research methods to use. This section describes the four strategies used to gather data for this research: interviews, documentary analysis, card sorting exercise and a demographic questionnaire. Discussion begins with a review of the interview strategies used.

3.4.1 Interview Strategies

Qualitative research has been criticized as anecdotal or illustrative, practiced in casual and unsystematic ways (Mason, 2002). Research strategies (Yin, 2002) are "ways of investigating empirical topics by following a set of prespecified procedures" (p. 15) that can provide a more systematic approach to designing qualitative studies. Strategies of inquiry (Denzin and Lincoln, 2005) "connect researchers to specific approaches and methods for collecting and analyzing empirical materials" (p. 379).

Research strategies for experiments, surveys, archival analysis, histories, and case studies are not hierarchical with respect to each other and each strategy can be used for exploratory, descriptive or explanatory research (Yin, 2002). Three factors that determine which of these might best suit a research situation are:

1) The form of the research question posed (whether how, why, who, what, where, how many or how much),

2) The extent to which the investigator has control over actual behavioural events

3) The degree of focus on contemporary versus historical events (Yin, 2002)

The choice of methods for contemporary events where the researcher does not have control of behaviour includes surveys and case studies. Surveys and archival analysis are recommended for "what" and most question types other than "how" and "why". Case studies are generally preferred when "how" or "why" questions are being posed, when the investigator has little control over events and the focus is on contemporary phenomenon (Yin, 2002)

The research design for both interview studies incorporated three complementary strategies, each of which provided detail on how to carry out one or more parts of the interview study not

available to the same degree in the other strategies. The overall approach used was Yin's Multiple Case Study approach (Yin, 2002) which provides a very high-level overview of options that may be used to carry out each of the steps involved in case study research.   Within these options, Flanagan's Critical Incident Technique (CIT) (Flanagan, 1954) was used to guide the CIT process used as the main question strategy, and the NatCen Framework (Ritchie and Spencer, 1994; Ritchie and Spencer, 2003) provided guidance for carrying out data analysis and reporting.   Mason (2002) was used as a general reference overall and where these three approaches did not provide specific instruction. These four resources together provided a degree of rigour to the interview studies that could not be accomplished by using just one strategy. Each of the detailed strategies used complied with approaches described by the higher level statements of the others without conflicting direction. Table 3-2 indicates where each strategy factored in interview study design, and the degree to which it guided the process, whether a primary (1) or secondary (2) influence. A more detailed discussion of these strategies and methods follow.

Strategy or Method	Study Protocol	Participant Recruitment	Data Collection (Interviewing)	Thematic Framework	Data Indexing	Cross Case Synthesis	Data Reporting
Multiple Case Studies (Yin, 2002, p.5)	1	1	2	2		2	2
FrameWork from NatCen (Ritchie and Spencer, 1994, Ritchie and Spencer, 2003)		2		1	1	1	1
Qualitative (semi-structured) interviewing (Mason, 2002)			2				
Critical incident technique (Flanagan, 1954)			1				

Table 3-2 Research strategies and key references incorporated in research design. Number "1" indicates primary influence; "2" indicates secondary influence.

Multiple Case Studies Research Strategy

Researchers apply different meanings to the words "case study" and interpret the concept in different ways in different situations. Not every researcher who practices case study research refers to their work as a case study (Stake, 2005). Qualitative research that focuses on exploration and description often uses a case study approach. The case studies research strategy, used by researchers in many different disciplines since the early nineteen hundreds (Dooley, 2002), is a familiar tool of LIS researchers (Zach, 2006). Case studies are an appropriate strategy for capturing knowledge of practitioners in areas where few studies have been carried out, subsequently developing theory (Eisenhardt, 1989; Benbasat *et al. 1*987). In this thesis, "case study" is the qualitative research strategy as described by Yin (2002).

The case study research strategy uses empirical inquiry to investigate a phenomenon within its real-life context (Yin, 2002). Case studies focus on understanding the dynamics present within

similar settings (Eisenhardt, 1989) They may draw on both qualitative and quantitative data, and may be *single*, involving an in-depth longitudinal examination of a single event, or *multiple*, involving two or more related cases. Multiple case study design using replication logic to select participants provides more robust and compelling evidence than single case studies (Yin, 2002). The multiple case study approach was chosen as the main research strategy for the First Interview Study.

A study's units of analysis are (Dallal, 2007) "the smallest units that are independent of each other or the smallest units for which all possible sets are equally likely to be in the sample" (p. 2). In social sciences research, the unit of analysis may be individuals or groups; artefacts such as books, photos or newspapers; geographical units such as towns or other census divisions; or social interactions, such as relationships or encounters (Trochim, 2006). A study may have one or more unit of analysis. Once the unit or units of analysis have been determined, participants can be recruited. For example, in the First Interview Study design, a single interview with a health care manager or decision-maker is a "case". The "units of analysis" were the information sources used in each case, as well as the approach to information seeking. The interviewee is labelled "participant".

Case study research generalizes to theory and propositions rather than to populations and other cases (Yin, 2002). It differs from other qualitative research in that even in exploratory research; theory is developed during the design phase and tested by the case study research. Criteria for success in case study research also include preparing a case study protocol, as discussed in the next part of this section. Exploratory case study research outlines activities and rationale for each step (Eisenhardt, 1989) in the research process. Theoretical statements developed during design may be as simple as stating what is to be explored, the purpose of the exploration and the criteria by which the exploration will be judged successful (Yin, 2002).

The researcher would judge this study as successful if it contributed to what was known about the workplace information behaviour of health service managers. Additional points considered during study design as suggested by Yin's Five Characteristics of an Exemplary Case Study (Yin, 2002) are listed in Table 3-3.

Five Characteristics of an Exemplary Case Study	This Study Design will
The study must be significant, where the cases are unusual and of general public interest and the underlying issues are nationally important with respect to theoretical terms, policy or practical application;	Research aims: Given increasing health services costs and perceptions of low rates of health research uptake, any important findings from this study should be of interest to those funding and working in health services and health services research.
The study must be complete, where the study boundaries between the phenomenon being studied and its context are tested through the analytic and reporting stages; the investigator was exhaustive in collecting evidence; and the study ended when the research as designed was completed	Participant selection: Study design will include at least the 6-10 cases recommended by Yin (Yin, 2002) plus enough cases to allow for literal and theoretical replication
Alternative perspectives must actively be sought and considered;	Analysis: The researcher will examine evidence from different perspectives
Sufficient relevant evidence must be presented neutrally with supporting and challenging data so a reader can make an independent judgment independent of the analysis	Analysis and reporting: Enough evidence will be presented to substantiate discussion. Cases will be examined individually and using cross case analysis; the chain of evidence will be maintained
Finally, the case study report must be written clearly with its intended audience in mind.	Reporting: This research is exploratory research so the report will take a linear-analytic structure. Reporting will be part of a larger study report but flagged as coming from the critical incident case.

Table 3-3 Consideration in Case Study Design that help make an exemplary case study (Yin, 2002).

Generalizability, Validity and Reliability

The concepts of generalization, validity and reliability are less well established in qualitative research than in quantitative research. Within qualitative research, these are correspondingly less well established for case study research (Riege, 2003). A review of case study research that identified approaches to validity and reliability provided options for this study. These were tested in graduate and post-graduate thesis and summarized with respect to research paradigm, authority, how they are used, and design phase used (Riege, 2003). This work, as discussed below, was included in study design as a checklist for validity and reliability.

Scholars have found reason to question the quality of case study findings for several reasons, including lack of researcher independence, if the researcher plays an interactive role instead of maintaining distance (Verschuren, 2003). Lack of objectivity in the researcher may be mitigated in several ways, including using multiple investigators (Eisenhardt, 1989), using outside experts with no knowledge of the system being implemented (Benbasat *et al. 1*987) and having more than one unit of analysis in each case (Meyer, 2001).

Case study research has also been seen to have a weakness related to theory generation. If the theory generated is too complex and detailed, it may lack the simplicity that an overall perspective would bring (Eisenhardt, 1989) and the perspective to recognize which relationships

are the most important (Dooley, 2002). When theory is too narrow and idiosyncratic, the theorist is unable to raise the generality of the theory (Eisenhardt, 1989). Solutions for overly narrow theory include multiple case studies (Meyer, 2001; Eisenhardt, 1989). Complex theory generated from overly rich data may be viewed by multiple investigators, each of whom would bring different perspectives to analysis (Eisenhardt, 1989).

The findings from a case study are generalizable analytically to theoretical propositions, not statistically to populations (Yin, 2002). A common complaint about case study research is low generalizability, particularly if few cases are studied. A comparative approach, especially with regard to contrasting extreme cases, may overcome this limitation (Verschuren, 2003). The multiple case study approach has an underlying replication logic, which involves generalization to theory rather than to empirical data. A series of cases is similar to a series of experiments. Each case is selected so it either predicts similar findings to the preceding cases (literal replication) that explains the conditions under which a particular phenomenon is likely to be found, or produces contrasting findings for predictable reasons (theoretical replication) that explain the conditions when it is not likely to be found.

Multiple investigators and outside experts were not practical options for this thesis work. Participant selection using theoretical and literal replication was incorporated into data gathering as part of the multiple case study design for this research.

Case Study Protocol and Interview Guide

A case study protocol is essential as a standardized agenda for the researcher in multiple case study research. Case study protocols are typically organized in four sections: an overview of the case study project, details on field procedures, case study questions and a guide for the case study report.

Preparing the case study protocol for the First Interview Study[*] (Appendix A) required the researcher to plan different aspects of the research according to basic case study techniques at the design stage. For example, the section on data collection required that the researcher plan for maintaining a chain of evidence, producing a case study database, and using multiple sources of evidence (Yin, 2002). Case study protocols are intended to increase reliability of case study research by guiding the researcher in the processes of data collection (Yin, 2002).

An interview guide was developed for the smaller Second Interview Study (Appendix C). This included the interview questions, the procedures and general rules to be followed in using the

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[*] Part 1 of this research is called the "First Interview Study" while Part 3 is called the "Second Interview Study". These were two separate interview studies with no participants interviewed in both studies, i.e. not a longitudinal study.

protocol as they applied to a single case, and materials and equipment for both the interview and the card sorting exercise.

Semi-Structured Interviews

Mason (2002) presents a rationale for choosing qualitative interviewing to collect data and discusses three approaches to qualitative interviews: in-depth, semi-structured and loosely structured interviews. Her work provides clear and specific detail on how to plan and conduct qualitative semi-structured interviews, so was used as a general guide to interviewing for this research.

Merton and Kendall (1946) described structured questions, unstructured questions and two kinds of semi-structured questions in terms of stimulus and response. In structured questions, the interviewer controls the interview by selecting the issues about which the participants comment and the order in which they are discussed (Merton and Kendall, 1946). Structured questions that specify both the stimulus and response may lead a participant to confirm or agree with something they have not actually said (Millward, 2006). In unstructured questions, the respondent is not guided with respect to which stimulus to respond to or the type of response required. Unstructured questions are especially appropriate at the beginning of interviews while more structured questions can give the interviewer more control toward the end of the interview (Merton and Kendall, 1946).

Semi-structured interviews minimize the weakness and combine the strengths of structured and unstructured interview techniques (Johns, 2002). Earlier in this section, discussion of rationale for selecting interviews as a means to gather data noted some of their strengths. Other strengths include the researcher being able to ask different questions of different interviewees (Mason, 2002), to probe for more detail into unexpected areas of interest that arise and rephrase questions to make them clearer for the interviewee. Weaknesses in semi-structured interviewing can include poor questions, response bias (where the participants express what they think the interviewer wants to hear), and participants' incomplete recollection of events (Sociology Central, 2002). There is a negative effect if the interviewer steps outside the role of listener to impose their own frame of reference (Merton and Kendall, 1946).

Merton and Kendall (1946) have categorized semi-structured interview questions with respect to how they focus on response and stimulus as Type A (response-structured stimulus-free) questions or Type B (response-free stimulus-structured) questions, and noted that each type allows respondent considerable freedom to reply. The authors give examples that suggest that Critical Incident Questions are Type A questions and Exploratory Questions are Type B questions (Merton and Kendall, 1946). The interviews in this research use three kinds of semi-structured questions, critical incident questions, exploratory questions and probing questions.

The rest of this section discusses the ways these three types of questions are used in this research.

Critical Incident Technique Questions

In response-structured stimulus-free questions the stimulus, or focus of the question, is specified but the nature of the response is left open (Millward, 2006), for example, when participants are asked to tell about a situation and describe what they did with respect to that situation. This type of question is congruent with one of Mason's recommendations (2002) which is that the interview be contextual, situational and interactional, to focus questions on specific experiences rather than hypothetical or general experiences, or simply be asking about their views. One strategy for doing this is the critical incident technique (CIT) (Flanagan, 1954) used as the main type of interview question in this research.

The critical incident technique (CIT) uses in-depth semi-structured interviews in a five-step procedure for gathering facts designed to isolate the critical factors that contribute to success or failure of an activity or series of activities. These five steps are general qualitative research processes: 1) to determine and state the general research aim, 2) develop a specific research plan, 3) collect the data, 4) analyze the data, and then 5) interpret and report the data.

CIT was used in the United States Army Air force during World War II to analyze flight-training problems. It is a flexible set of principles that can be modified and adapted to suit the situation being studied, rather than a single rigid set of rules for data collection (Flanagan, 1954). Criteria for a critical incident are simple. The incident may be any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical (Flanagan, 1954) "an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects" (p. 327).

The CIT has been adapted for use in different disciplines where specific processes are being examined, including health research and information behaviour research (Urquhart, 2004), business services, marketing and consumer behaviour (Gremler, 2004; Burns, *et al. 2*000). Flanagan (1954) lists specifications for CIT interviews that apply to the observer, the groups to be observed and the behaviours to be observed. He also provides examples of introductory remarks and questions to be asked. These specific details were integrated into the study design and protocol.

Although the soundness of the CIT method is demonstrated by the few modifications it has had since it was first introduced, criticisms include researchers misinterpreting or misunderstanding stories, lapses in participant memory, breaks in consistency, participants reinterpreting the

incident, variation in what participants consider to be a critical incident, and participant reluctance to take the time to describe critical incidents in the detail needed (Gremler, 2004).

Probing Questions

Interviews differ from every day conversations in that, as the interviewer, the researcher should not take for granted that they share a common understanding of terms and interpretation of events with the interviewee (Klente, 2008). When interviewee's responses are vague, incomplete or not forthcoming, or more detail about any response is needed, the interviewer probes for additional detail. Probing questions are usually "when", "where", "who else" and "what" types of questions. They are useful to encourage a response if an interviewee has decided not to answer a question judged too personal or not completely understood or if an interviewee gives verbal clues inconsistent with a response.

Probing questions can used to test the validity of an interviewer's interpretation of an interviewee's position on a particular issue. They can also help reduce the risk of social desirability bias (Edwards, 1957), a tendency in semi-structured interviews for research participants to provide the responses that cast them in the most favourable light (Barriball and While, 1994).

One or more probing questions were prepared for each CIT question asked in both interview studies. These were listed in the study protocol, to be used if required.

Exploratory Questions

In stimulus-free response-structured questions, the focus of the question is not specified but the nature of the response is (Millward, 2006). Exploratory Questions force participants to focus their attention on issues that they may not otherwise have responded to on their own initiative (Merton and Kendall, 1946).

To be certain of gathering information about participants' information behaviours, should CIT questions and discussion not provide enough detail, a number of extra stimulus-free response-structured questions were prepared to gather details of what participants usually do. Participants were asked to describe their usual information behaviours in any situation.

Exploratory questions prepared for both interview studies were asked separately, after critical incident discussion.

3.4.2 Documentary Analysis

Documentary analysis (Ritchie, 2003) "involves the study of existing documents, either to understand their substantive content or to illuminate deeper meanings which may be revealed by their style and coverage" (p. 35). Documentary analysis differs from content analysis (Spencer *et*

al. 2003) where "both the content and context of document are analyzed: themes are identified" (p. 200). This researcher decided to begin exploring health service managers' group information sharing by quantifying opportunities for them to meet so decided to examine electronic meeting room calendars. These calendars included only basic information related to time and place with little additional information to provide context, so documentary analysis was identified as the more suitable method over content analysis.

At the time this Calendar Study was being planned and conducted, a search of the literature did not identify any other research examining print or electronic calendars.

3.4.3 Card Sorting Exercise

Sorting exercises using pictures, cards or other objects have been used in qualitative research to determine how people categorize or prioritize issues and see relationships between them, such as what does or does not belong (Arthur and Nazroo, 2003). Card sorting exercises can be used in exploratory research to facilitate subsequent discussion about choices and as a main research approach to identify differences between research subjects who are asked to categorize or sort the same things (Arthur and Nazroo, 2003). These exercises have been used to investigate the nature of expertise, based on the assumption that experts' more extensive knowledge of their subject allows them to more easily categorize issues (Rugg and McGeorge, 2005). Card sorting is also used by systems and building designers to elicit user input (Spencer and Warfel, 2004).

Open card sorting and closed card sorting are two main approaches. In *open card sorting*, no pre-defined groupings are suggested. Participants are given cards and asked to sort cards into as many appropriate groups as they like and then name and describe each group. In *closed card sorting*, participants are asked to sort cards into predefined groups (Lewis and Hepburn 2010).

Within these two main approaches, there are several varieties of card sorting techniques including Q-sorts, hierarchical sorts, all-in-one sorts and repeated single criterion sorts (Rugg and McGeorge, 2005). In time-consuming *Q-sorts,* participants sort a large number of cards into a predefined normal distribution then statistical analysis is used across different participants' sorts. *Hierarchical sorts* are used to establish semantic hierarchies within a domain using cards from the same or different semantic categories. In *Repeated single criterion sorts,* participants sort the same cards into a number of different categories characterized by different single attributes or criterion each time. In *All-in-one-sorts,* participants perform only one sort. These can be either simple sorts into clusters of overall similarity or more complex biaxial matrices where two factors are considered (Rugg and McGeorge, 2005).

Card sorting data can be analyzed by counting or through statistical analysis that considers type of criteria used to differentiate between cards and commonalities between choices (Rugg and McGeorge, 2005)

The card sorting exercise included in the Second Interview Study was a closed all-in-one sort designed to examine whether, and if so how, perceptions on value of different types of information varied across all participants and within subgroups defined by portfolio, number of health services career years and position level. The level of detail that might have been determined from other card sorting techniques was not needed to meet this particular information need, and time to do a lengthy card sorting exercise was not available.

Card sorting data were analyzed quantitatively, simply by counting assigned choices for the group and for individuals with shared demographic variables. Social network analysis was also explored to analyze card sorting results, but this approach was not productive.

3.4.4 Demographic Questionnaire
At the end of the interview, a demographic questionnaire (Appendix A) was used to gather information on each participant, including their name, age, sex, years of health experience, health service area, current role reflecting level on the organizational chart, employment status and highest level of education completed.

3.4.5 Section Conclusion
This section has discussed the semi-structured interviews, card sorting exercise, documentary analysis and demographic questionnaire used to gather data for this thesis, summarizing research that has contributed to development of each and rationale leading to the choice of each method for this thesis. The next section summarizes approaches used in analyzing the data gathered in this research.

3.5 Data Analysis Strategies

Quantitative research interview studies generally test hypotheses drawn from the research literature. With little published research on the information behaviour of health service managers, this approach was not feasible. This section describes the approach planned for analyzing data gathered through interviews for this study.

Rather than beginning with a hypothesis, Part 1: the First Interview Study was designed to explore and describe information behaviours through participants' accounts of what happened in their natural settings, then develop explanations based on the literature review and further analysis of interview responses. This process of studying facts and then devising a theory to explain them is termed *abductive reasoning* (Dubois & Gadde, 2002).

Qualitative data analysis most often involves consideration of words and concepts rather than statistical analysis of numbers. Data analysis begins with examining the data to gain familiarity with it, followed by categorizing, coding or indexing the data, then tabulating or diagramming the data, and recombining it to test the initial propositions of a study. Finally, the researcher draws an explanation or argument from the data (Yin, 2003; Mason, 2002).

However, qualitative research methods can also generate quantitative data such as participants' demographic characteristics (Bath, 2004). Raw qualitative data can be transformed into quantitative data by coding and counting using processes similar to content analysis (Hertog, 2002).

This section describes the data analysis methods used in this research, beginning with a description of the NatCen FrameWork approach.

3.5.1 Cross Case Analysis and NatCen FrameWork

Study design should include a general strategy for data analysis. Of three general strategies recommended for use in case study research data analysis, the preferred approach for research shaped by theoretical propositions is to examine data that would support these or define alternatives and then organize the case study findings around that. A second strategy is to define and test rival explanations to the initial theoretical propositions. A third, less preferable descriptive approach has been used in analyzing interview data for this research. This approach, taken when there are no hypotheses or propositions, is to develop a case description and then use a descriptive framework to organize the case and help identify issues to analyze (Yin, 2002).

Within the general strategy chosen for data analysis, five specific techniques are generally recommended in case study research. The first four of these, pattern matching, explanation building, time-series analysis, and logic models may be used in both single and multiple case studies (Yin, 2002). *Cross-case synthesis*, the fifth data analysis technique, is used only in multiple case study research. This approach treats each individual case as a separate study. In this technique, tabular frameworks are used to display data from individual cases about specific issues of interest. Cases may be selected based on whether they are expected to be similar or different. Analysis involves examining tables for patterns across cases, and interpreting these, supporting arguments with data (Yin, 2002).

The NatCen FrameWork builds on cross-case synthesis to create a five step systematic approach to qualitative data analysis. This approach was developed by the UK National Centre for Social Research for primary applied social policy qualitative research. The NatCen FrameWork approach is grounded in the original data of the research study. Ritchie and Spencer (2003; 1994) have outlined the following five steps:

1) Familiarization with the data

2) Identifying a thematic framework of initial themes or concepts and then constructing an index to suit the type of qualitative analysis underway;

3) Labelling or tagging the documents with index terms, creating additional terms as needed;

4) Using a matrix of charts to sort and order the data in the form of notes and excerpts related to key themes and associated subtopics from interviews

5) Summarizing, synthesizing, interpreting and explaining the data

This methodology allows comparison between cases while maintaining the integrity of the individual case. Rather than coding data, all of the data are indexed much the same as an index at the back of the book, so relevant data can be located quickly. Then data are lifted from interview transcripts and summarized into cells facilitating within- and between-case comparisons.

3.5.2 Thematic Frameworks

In qualitative research analysis, data are categorized and sorted, then grouped according to relationships to highlight patterns and help explain the data. After becoming familiar with the interview data and identifying any recurring themes, the second step in the five-step data analysis process associated with using the NatCen FrameWork approach involves identifying a framework of initial themes or concepts. Once the framework is identified, an index is constructed to suit the type of qualitative analysis underway (Ritchie and Spencer, 2003).

These conceptual or thematic frameworks may be pre-defined, either taken from a single research study or developed from multiple research studies at the beginning of the study, or developed through an iterative approach during analysis, as in this research where frameworks were derived from the data and related research literature. If a pre-existing framework is used, the researcher must understand its derivation. If there is no suitable pre-existing framework, then the researcher must determine a rationale for data analysis and explain the strategy.

Thematic frameworks were developed for this research as an iterative process during data analysis and reporting. Although theoretical work was identified on the types of information health managers might or should use, at the study design phase no pre-defined frameworks for use in indexing either information or information behaviours in transcripts had been identified from the literature.

Research on information behaviours was limited to information needs, information uses and information seeking. Information channels and containers (journal articles, reports, etc.) identified from the literature (Table 2-1) and from the researcher's experience were grouped in the star chart shown in Figure 3-2.

Figure 3-2 Star Chart of Information health service managers use, 2003

3.5.3 Within Case Analysis

Had meeting minutes been available for groups of health service managers, and available in enough detail to yield data for analysis, content analysis of meeting minutes may have been used to generate data. This might have identified the information used to inform group decisions and the information behaviour associated with each piece of information. As an alternative to analyzing written meeting records, in the Second Interview Study within case analysis was used to examine interview data.

Paterson (2010) has defined *within case analysis* in case study research as "an in-depth exploration of a single case as a standalone entity" (p. 970). Techniques used within individual cases can contribute rich detail that contributes to the researcher's understanding of the case (Ayres, 2003).

Few guidelines have been developed for how to conduct within case analysis (Paterson, 2010). Yin (1981a) suggested three ways to reduce problems associated with within-case analysis. The first involves note-taking to create readable narratives, which was not an issue in this study where interviews were transcribed verbatim for analysis. The second relates to tabulating only meaningful events because problems occur when too many categories are used or when the

categories are too small. The third relates to building explanations that are accurate, consider alternative explanations and draw a single conclusion that appears most congruent with the facts.

Studies that have tabulated and quantified qualitative data include case study research on life histories of innovations (Yin, 1981b) and on the number of decisions needed to implement a policy (Pressman and Wildavsky, 1973). Researchers who have pooled case studies into large data sets have used statistical tests to generate results that they have then generalized (Hertog, 2002).

In the Second Interview Study, information transactions as units of analysis were coded and counted from descriptions of meetings in interview transcripts. These were then mapped and examined and then reported quantitatively. The researcher was not able to find a recommended series of steps that spelled out exactly how to code, count, map, analyze, tabulate data gathered though qualitative case study research to allow it to be reported quantitatively. The specific methods used are described in Chapter 6.

3.5.4 Section Conclusion
This section has summarized the approach used to analyze data gathered through semi-structured interviews for this study. The next section describes the approach used to report study results.

3.6 Data Reporting Strategies

In qualitative research, the report usually presents the findings as research evidence and arguments together in one of four ways:

1) Data are presented and then discussed with concluding arguments (Morse *et al. 2*001, cited in White *et al.* 2003);

2) Main findings and conclusions are presented with evidence to support them (Morse *et al. 2*001, cited in White *et al.* 2003);

3) The findings are organized according to existing theory and study evidence considered with respect to each (Rubin and Rubin 1995, cited in White *et al.* 2003);

4) The findings are presented following research design logic by participant groups, cases or sites (Rubin and Rubin 1995, cited in White *et al.* 2003);

White, *et al.* (2003) advise that the findings from descriptive research should include four components: 1) examples of the original material on which description and classification is based, 2) the range and diversity of the different elements found, 3) a map of all of the categories

that have been detected and 4) the basis of any subsequent classification and how different categories have been assigned. The same authors advise that although there is no right or wrong order to presenting these four components, explanations should include both the development or derivation of classification systems used and the logical order of the sequence in which they are presented (White *et al.* 2003).

In this research study, the findings or results are presented using one of the first three suggested approaches. In both interview studies, a thematic diagram is presented first, and then illustrated by a selection of the original material. Chapter 7 provides discussion of results across the three studies.

The next section describes preparation and equipment for Parts 1 and 3 of this research, the two interview studies.

3.7 Fieldwork Preparation and Equipment

This section describes preparatory work completed before interviews were conducted. Additional details are included in Appendix A. First Interview Study Case Study Protocol, Appendix B. Annapolis Valley Health Research Ethics Committee Documents and Appendix C. Second Interview Study Guide.

3.7.1 Research Ethics Approval

The Annapolis Valley Health District Research Ethics Committee monitors scientific and ethical issues related to research conducted within the District. To receive approval for this project, the researcher submitted the Committee's ethics approval forms, the research protocol and a letter of support to the Committee for Part 1 of this thesis research on 15 April 2004 (Appendix B). The Ethics Committee gave notice of their approval for the project 6 May 2004.

The Committee approved Parts 2 and Part 3 of this research in January 2008, and granted an extension for one year in March 2009 to allow additional data gathering.

3.7.2 Invitation to Participate

The researcher contacted each participant by e-mail explaining the research study, and inviting the participants to participate in a one-hour interview. Invitations are included in Appendix A. Interview appointments were booked at mutually convenient times.

The researcher travelled 2.5 hours each way to conduct interviews, so typically scheduled several one-hour interview appointments during each trip, allowing enough time between interviews to reach the next appointment.

3.7.3 Consent and Anonymity form

Each interview began with an overview of the interview process and an explanation of the confidentiality that would be applied. In compliance with Annapolis Valley District Research Ethics Committee guidelines, each participant signed a consent form indicating their willingness to participate in the research (Appendix B).

3.7.4 Recording equipment

Interviews were audio taped on a cassette recorder with battery backup. Cassettes used could store recordings up to forty-five minutes duration on each side.

3.8 Chapter Conclusion

This Chapter outlined the strategies and methods as considered during study design, including available theory behind these and strengths and limitations of methods as identified in the literature. The application of these methods, including any innovations and tools, limitations and action taken to address validity and reliability issues is discussed in Study Chapters 4, 5 and 6, together with the study findings.

Chapter 4 The First Interview Study[*]

4.1 Introduction

This Chapter presents first a qualitative semi-structured interview study that included critical incident questions, exploratory questions and a demographic questionnaire. Study methods are presented first, and then the findings are discussed with reference to existing research literature.

4.2 Methods

Denzin and Lincoln (2005b) suggested that qualitative case study researchers identify f*oreshadowed problems,* and begin research with an idea of the issues to explore and what to look for within these. The Literature Review, summarized in Chapter 2, identified little published research on the information behaviour of health service managers. Research on managers in general (Simon, 1977; Mintzberg *et al.*1976; Mintzberg, 1973; Simon, 1965) suggested areas that helped focus the research.

The broad research question identified at the beginning of the study could be broken into a series of smaller questions that may have been useful to frame research results. These would still have been too general to be used as "foreshadowing questions" to focus inquiry. Research presented in the literature review suggested five compound questions that outline the main concerns of this study. These were used to help develop the interview questions.

1) **Workplace situations and roles:** Why do health service managers need information in their work? In what work roles and tasks are health managers and decision-makers typically engaged when they require information to support decision-making? Is it possible to identify points during the decision-making process when specific kinds of information are typically needed?

2) **Information:** What information do they need and use? What or whom are their key information sources and providers? What are their preferences with respect to information sources, channels, forms and locations?

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[*] Part 1 of this research is called the "First Interview Study" while Part 3 is called the "Second Interview Study". These were two separate interview studies with no participants interviewed in both studies, i.e. not a longitudinal study.

3) **Information Behaviour:** How do they go about getting the information they want? How do they appraise the information they access? How do health managers and decision-makers decide that they have enough information for effective decision-making?

4) **Barriers and Challenges:** What problems do they have accessing the information they need?

5) **Models:** What information seeking models best represent the information behaviour of this group?

4.2.1 Interview Questions

This study used semi-structured interviews conducted within a methodological framework of multiple case studies (Yin, 2002) and a Critical Incident Technique (CIT) (Flanagan, 1954). Data were analyzed categorically using ATLAS.ti^{TM} as the indexing tool, and NatCen FrameWork for interpretation. These methodologies, described in Chapter 3, were applied in this interview study as discussed below.

Zach's exploratory study of arts administrators' information behaviour (Zach, 2002) identified from the literature review used a multiple case study approach, semi-structured interviews and a critical incident technique. Because of similarities with the goals and methods of Zach's study, and the effectiveness of her interview questions in gathering information, it provided a starting point for developing the question set for this interview study.

A set of sixteen interview questions were developed, organized as ten CIT questions and six general exploratory questions (Table 4-1). Probing questions for each were prepared to be used if needed. Questions eleven to sixteen were designed to capture attributes of their general information behaviour for problem solving and decision-making. The complete question set is included in Appendix A.

4.2.2 Study Recruitment

At the beginning of the study period, there were approximately sixty-one members of the Annapolis Valley Health Leadership Forum, and seventy-two volunteer Board members, twelve on the one District Health Authority Governance Board and sixty on five community health boards.

Interview Questions		Research Questions			
	1. Workplace Situations and Roles	2. Information	3. Information Behaviour	4. Information Barriers and Challenges	5. Information Models
CRITICAL INCIDENT QUESTIONS					
1. How did it come about?	X				
2. What did you do first?	X				
3. If you used any information to help make your decision, where did you get it?		X	X		
4. If you used information that you were given or had already, what did you use, in terms of specific kinds of information		X	X		
5. If you didn't have the information you knew you needed, where did you go first?		X	X		
6. Did you use any other source?		X	X		
7. What information did you need but couldn't find?		X	X	X	
8. What information did you find most useful?		X	X	X	
9. How did you decide when you had enough information?			X	X	
10. If you were making this decision over again, what would you do differently, if anything?	X				
EXPLORATORY 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?			X		
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?	X		X		X
13. What factors influence the level of effort you spend looking for information? Level of effort = time and trouble to get information – cost, number and types of sources checked, their ease of use or familiarity, location and accessibility, ease of access	X		X	X	
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?	X		X		
15. Generally, if you could pick one format of information to find when you look for information what would you prefer? Verbal, printed, video, or electronic?		X	X	X	
16. Is there anything else you think I should know about the way you look for information?		X	X	X	X

Table 4-1 Interview Questions

A distribution list for an AVH Leadership Forum meeting agenda from early 2005 was classified into sixteen groups, by portfolio and position level and then by AVH-only or shared by three Districts (triDHA), as shown in Table 4-2. The Senior Executive includes the Chief Executive Officer and four vice presidents who administered the Acute Care, Community Health, Operations and Medicine portfolios. Leadership also included *Directors* who oversaw services of two or more departments, and *Managers* of individual departments.

The distribution list for that meeting included several names just below the Manager level responsible for leading programs or services without staff or budgets. These included employees such as those with accountability for infection control, occupational health, and clinical nursing education. Some of these positions were legislated, required in Nova Scotia health services.

# DHA	Portfolio	Position Level	number in pool in 2005-2006
AVH	Senior Executive	CEO or VP	5
AVH	Community Health	Director	1
AVH	Acute Care	Director	2
AVH	Operations	Director	2
AVH	Administration	Director	2
AVH	Community Health	Manager	5
AVH	Acute Care	Manager	10
AVH	Operations	Manager	6
AVH	Community Health	Manager	5
AVH	Administration	Junior Leader	?
AVH	Acute Care	Junior Leader	?
triDHA	Community Health	Director	2
triDHA	Community Health	Manager**	4
triDHA	Operations	Director**	4
triDHA	Operations	Manager	6
triDHA	Administrative	Director	1
			55
AVH	CHB		60
AVH	Governance Board		12

Table 4-2 Number of Potential Participants by Portfolio and Position Level

These were similar in that they were charged with responsibility for leading a specific service or program but without accountability for budget or staff. The convenience label "Junior Leader" has been used in this research for these employees. Leaders at all levels are generically labelled "managers" in this thesis unless the discussion relates to a specific level of management.

For convenience, members of Senior Executive, staff in the Corporate Office, Human Resources and Finance has been grouped as "Administration", an artificial portfolio label for this research. Members of the Medical Portfolio, physicians who make up the medical staff, were excluded because they were neither paid employees nor volunteers and because their routine decision-making relates to individual patient care, which was outside the scope of this study.

Multiple case study research design allows theoretical replication, where participants' selection is purposive so interviews are conducted with predicted contrasting findings. As suggested by Yin (2002) and discussed above, participants were selected first for literal replication (predicted similarities) and then for theoretical replication (predicted differences). Five sets of interviews were conducted, with two, three, five, eight and three interviews respectively, as shown in Figure 4-1. Participants were chosen for predicted similarities and differences in information behaviour patterns noticed in the previous sets of interviews.
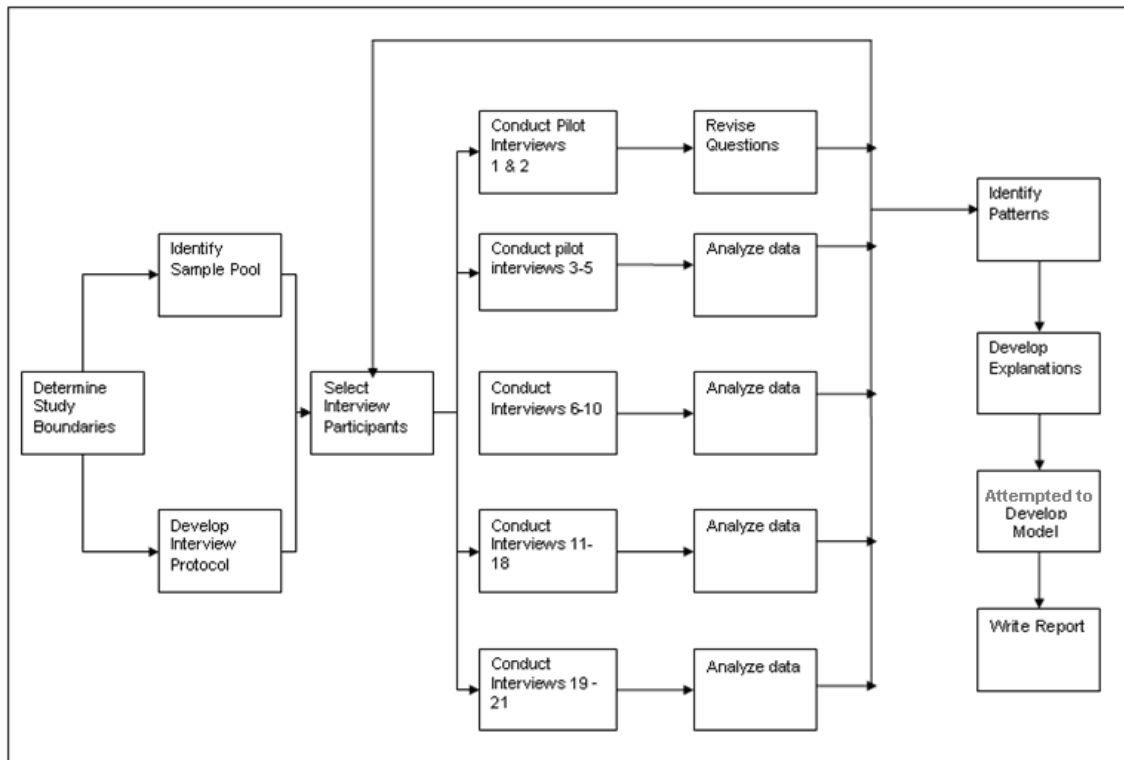
Figure 4-1 Multiple Case Studies Design adapted from Zach (2002) as adapted from Yin (1994); Discussed in Yin (2002)

The next subsection discusses the warm up exercise and pilot interviews used to help ensure interview success.

4.2.3 Interview Preparation

A five-minute warm-up exercise was used to prepare participants to engage in discussion at the beginning of the interview (Appendix A).

The first five of the twenty-one interviews conducted for this study were pilot interviews with an interview evaluation form (Appendix A). The first two pilot interviews were discarded as participant evaluations and researcher self-evaluations prompted revision of some questions. No changes resulted from the second set of three pilot interviews so these were retained as part of the study.

4.2.4 Transcription

Taped interviews were transcribed verbatim into an MSAccess^{TM} database using a data entry form constructed from the original question set with linked tables for additional discussion and researcher's notes. These included both questions and responses and were maintained in their original state for the duration of the study to serve as both primary documents and the case study database. Each set of primary documents generated individual text files to be indexed with Atlas.ti^{TM} software, and then used in cross-case analysis.

4.2.5 Data Saturation

Data saturation is the point at which the researcher stops collecting data because no new knowledge is being gathered. This subsection describes the means by which the researcher determined that enough information had been collected.

In the initial study design, the researcher estimated that 12-15 interviews would be completed. The expectation was that there would be much discussion about information seeking. Participants were selected based on literal and theoretical replication, as shown in Figure 4-1 and discussed above. Each set of interviews were conducted, transcribed and reviewed before proceeding with additional interviews. Early in the series of interviews, participants described more information sharing than information seeking and more group decision-making than individual decision-making. After the first ten interviews were completed, the next eight were participants chosen for their potential to give different perspectives. When no differences were noted, three more participants were interviewed to be certain. When no new patterns emerged, data collection was discontinued. This proved to be when twenty-one interviews, including two pilot interviews, had been completed.

4.3 Data Analysis Using NatCen FrameWork

This exploratory interview study of health service managers generated a large amount of rich data with detail about processes that did not appear to be well studied in LIS research. One way to deal with these findings was to present them within existing frameworks identified from the literature where these existed. The findings have been presented within frameworks on managers' decisional roles, information poverty, and information overload. Other data has been examined with frameworks developed from several research fronts, for example decision complexity, and information use within decision phases. Where no existing research could be found, or where participant behaviours did not match existing research, frameworks were generated from the findings, for example information shared to inform decisions.

FrameWork (Ritchie and Spencer, 2003), the matrix-based content analysis technique developed for qualitative research by the UK National Centre for Social Research (NatCen) was described in Chapter 3.   The FrameWork data analysis process involves five key stages (Ritchie and Spencer, 1994). These have been used to structure a detailed description of the methods used in data analysis in the rest of this Section.

4.3.1 Data Familiarization

Within two weeks of each interview, tapes were transcribed directly into MSAccess^{TM,} database using a form that noted participant number and question number. MSAccess^{TM} was used to store and sift through interviews because of the researcher's familiarity with its flexibility and search features, and the expected richness of interview data.

Relationships established between the MSAccess^{TM} database tables linked questions and participants with responses, and foreshadowing questions with interview questions, and allowed creation of forms, queries and reports. Throughout the interview period, participants' descriptions of what they did with respect to their critical incident and more generally were examined and compared by position level and by portfolio.

4.3.2 Development of a Thematic Framework

This subsection describes in detail the process of developing the thematic frameworks that provided structure as data were being analyzed and use of these frameworks in indexing, charting, mapping and interpreting.

Before indexing data, the researcher re-examined the literature relating to information behaviour and decision-making for concepts related to information needs, information uses, and information seeking and searching and concepts related to rational and group decision-making. Sixteen information behaviour and decision-making models retrieved through the literature review were listed and compared in an Excel spreadsheet with names of models as columns, and terms

describing concepts as rows, to show overlap between different but apparently congruent models, as shown in Table 4-3.

In the first pass through interview transcripts, each item of information was indexed as internal or external, written or recorded. Second and third passes through the information were made to additionally index passages first as explicit, tacit or cultural information and then to identify types of information within these categories.

Critical incident decisions were considered within a framework of six sets of variables: whether a group or individual decision, decision structure (Mintzberg *et al. 1*976), policy decision type (CHSRF, 1998, p.2), decision situation (Mintzberg *et al. 1*976), decision level (Heller *et al.*1988), and decision mode (Lipshitz and Strauss, 1997; Mintzberg *et al. 1*976; Simon, 1977; Cohen *et al. 1*972; Allison, 1971; March and Simon, 1958).

Table 4-3 Placeholder for conceptual framework developed from study of sixteen information behaviour and decision-making models (see Appendix D).

The resulting list of concepts was added to terms grouped in the Star Chart (Figure 3-2) used as a conceptual framework for indexing interview transcripts. This list included terms related to information needs, to answer questions, to reduce uncertainty and to make sense (Case, 2007), information behaviour of arts administrators (Zach, 2002), task complexity (Bystrom, 1999; Bystrom and Jarvelln 1995), Simon's (1978) four broad classes, Taylor's (1991) eight classes of information use, and March's (1994) three classes of attention and search.

1.	Critical Incident Description
2.	Decision Types
3.	Decision Modes
4.	Decision Making Phases (Processes)
5.	Decision Making Influences
6.	Decision Making Approaches (Satisficing, etc.)
7.	Information
8.	Information Behaviour
9.	Information Uses
10.	Information Channels
11.	Internal Information Sources Used
12.	External Information Sources Used
13.	Information Seeking Strategies (Approaches to meeting information needs)
14.	Information Search Steps (Processes)
15.	Barriers and challenges (to information access and use)
16.	Unmet Information Needs
17.	Level of Effort & Task Importance
18.	Expertise & Experience
19.	Concepts from Strategic information management & health information management
20.	*What* information is used *when* in healthcare decision making (related: Situational Relevance)

Table 4-4 Initial Thematic Framework

Each passage was re-examined and classified by type of information used. Each new term was defined as it was added to an ATLAS.ti^TM family developed from the three categories. After all passages were indexed, they were examined for each term and redundancies addressed. Some terms were consolidated, for example passages indexed with patient safety, employee safety and environmental safety were indexed with the more general term "safety". As recurrent themes emerged (Ritchie and Spencer, 1994), they were listed as shown in Table 4-4, which also helped to identify areas where additional literature searching was needed.

Concepts from these information behaviour models and decision-making models that fell within Simon's four phases of rational decision-making presented a sequence of steps that started with a stimulus that provoked an information need and ended with evaluation of the solution implemented. These steps are shown in Figure 4-3. As behaviours and activities were encountered that could not be indexed with one of these terms, the researcher interrupted analysis and returned to the literature to search for research that described the behaviour or activity.

4.3.3 Indexing

In categorical indexing (Mason, 2002), "the researcher applies a uniform set of indexing categories systematically and consistently to their data" (p. 150-151). Categorical indexing families were developed based on the initial thematic framework (Table 4-4). ATLAS.ti^TM was used to organize indexing terms into families and to link terms to text. Interview response indexing was initiated with 374 indexing terms linked within one or more of the indexing families. Terms that were more ambiguous were defined and redundancies and gaps were addressed.

Indexing began with one line-by-line pass through the 19 interviews. New index terms were added as needed. As the interviews were indexed not coded, and there were a small number of interviews, a holdout sample was not used to develop or verify the classification scheme (Gremler, 2004). To help ensure consistency in indexing, the first transcript was re-indexed and the original indexing discarded. At the end of this process there were 521 indexing terms, of which almost 20%, 107 of the original 374 indexing terms, had not been used.

The next step in index development was to examine the indexing structure for each index family to ensure that all new index terms were linked or included in one of the index families. Throughout this stage, the ATLAS.ti^{TM} Memo feature was used to record interpretation and assign meaning to indexed passages.

In a second round of indexing, terms were filtered for each index family to block other coding. Working with three interviews at a time, each document was re-indexed passage by passage. A third round followed, in which the first half of each document, relating to the critical incident description and discussion, was highlighted and indexed passage by passage with index terms from only the four families related to decision-making. Finally, as the last step in the indexing process, definitions were re-examined for each index term, and both indexing and terms within each of the index families checked for duplication.

The 21 index families were consolidated into 13 and then to three families with subfamilies. Through this process, problems with conflicting or overlapping index terms were addressed as needed and duplicate indexing arising from the second and third pass was removed.

After data were analyzed and the findings reported, indexed passages were re-examined. The intent was first to determine whether participant information seeking could be characterized by the models described in the Literature Review, and then look for any mention of challenges associated with inappropriate information quantity, whether too much information or too little, and finally, to determine whether and how decisions were being supported by research evidence.

4.3.4 Charting

Following NatCen FrameWork processes for qualitative data analysis (Ritchie and Spencer, 2003; Ritchie and Spencer, 1994) an Excel spreadsheet was developed. One worksheet was set up for each subfamily. Tables were created with participant numbers as row headings and concepts related to model or theory components as column headings. Column shading was used to distinguish between concepts. Small fonts and the window-freezing feature were used to read wide charts.

Using ATLAS.ti™, data were filtered by family and subfamily and text output requested for all codes with quotations for that family.   At this point, indexed passages were reviewed selectively for inclusion in the thematic chart. A quotation, including participant number, its first and last line in responses were copied from the ATLAS.ti™ editor and pasted into the appropriate chart.

Once the families were charted, charts were reviewed and compared by theme and subtopic and by participant, looking for associations and relationships between participants' responses. Some shifting and copying took place within and between charts in order to achieve best fit.

There was extensive data on information that participants said influenced their decisions, so these items were indexed as organizational knowledge and gaps.

4.3.5 Mapping and Interpretation

The chosen approach for interpreting data as a whole was to identify participants' attitudes, experiences and behaviour and then provide explanations (Ritchie and Spencer, 1994). Explanatory analysis was facilitated by the functionalities of the three different types of software. The MSAccess ™ database allowed fields to be searched by keyword and filtered by participant and question. ATLAS.ti™ allowed the transcripts to be searched by index, quotations and memos, and the Excel ™ spreadsheets containing the NatCen FrameWork Charts allowed examination between and within cases and themes, and revealed clusters of cases with similar concerns.

In interview findings, explicit explanations are built based on participants' own explanations in their responses. These are presented with summary statements and passages that demonstrate commonly held and divergent perceptions and experiences. Implicit explanations were developed through the researcher's observation of relationships and linkages in the data, or through inference based on knowledge of the situation or context that contributed to the participant's experience. Taking care that preconceived ideas were not imposed on the data without justification, implicit explanations involved noting adjacent but seemingly unrelated themes, repeated coexistence of sets of themes whether linked or even discussed in neighbouring passages, and the absence in participants' responses of expected perceptions or experiences (Spencer *et al.* 2003). Clusters of cases with similar concerns were also noted. The researcher opted to offer explanations with certainty where there was clear or strong evidence, and suggest explanations where evidence was less conclusive.

4.3.6 Validity

As a means to help determine validity, a participant evaluation package (Appendix E), including a summary of interview findings, an evaluation form and a covering letter, was printed and given to the 16 of the 21 participants still working in the organization, including the pilot participants. Of

the five participants who had left the organization, only one was successfully contacted with a participant evaluation package.

Eleven participant evaluations were completed and returned. Of five participants still with the organization who did not respond, one was on sick leave and another had read and commented on a paper submitted to iSHIMR, 2007, the 12th International Symposium on Health Information Management Research (MacDonald *et al. 2*007). Participant responses to the study summary are discussed near the end of this Chapter, in Respondent Validation, also known as Member Checking, below.

4.4   Study Results – Description of Sample

This Section presents the study recruitment response rate as well as interview and participant characteristics.

4.4.1 Response Rate

All health decision-makers who were asked to participate in interviews agreed to be interviewed, a 100% response rate.

4.4.2 Interview Characteristics

With little time between interviews, and participants' schedules that did not allow appointments to run over, there was little variation in interview length. Interview characteristics are reported using number of questions asked and response word counts rather than length expressed in minutes.

Response word count ranged from 3,549 to 9,186 words. The mean count was 5,743 words; the median was 4,894 words. The complete set of critical incident, exploratory and probing questions included 138 questions. The number of questions asked per interview ranged from 29 to 84 with a mean number of 45 questions; the median was 44 questions. There did not appear to be a relationship between questions asked and response word count, as the interview with fewest questions asked had a word count of 8,813 words.

4.4.3 Participant Characteristics

All interview participants had completed post- secondary education. Two participants were chosen from the volunteer boards, one from the governance board and one from an advisory board. Of the remaining participants, fifteen were hybrid managers, educated clinicians who after some years of experience in their professions became managers. The others were career managers, individuals who studied to become managers or who were educated in professions such as computer science or engineering and entered health services in a leadership role. The mean participant age was 51 years old, and the mean length of health career was 21 years. Only four of those who were registered professionals did not also have a university degree. Additional participant characteristics are summarized in Table 4-5.

Employment Status		Gender	
Paid, full time	17	Female	13
Volunteer, part time	2	Male	6
Employer		**Age range**	
Single DHA	15	25-34	2
Shared Services (three DHAs)	4	45-54	11
Portfolio		55-64	6
Acute Care	4	**Education**	
Community Health	5	Graduate Degree	11
Operations	6	Undergraduate Degree	4
Administration	2	Other post-secondary education	4
Board	2	**Professional Status**	
Organizational Level		Professional Qualifications	12
Paid Employees		No Professional Qualifications	7
Senior Executive	2	**Healthcare services career years**	
Director	7	0-4	2
Manager	5	5-9	2
Junior Leader	3	15-19	3
Volunteers		20-24	2
Board Chair	1	25-29	4
Board Member	1	30-34	3

Table 4-5 Participant Characteristics

4.5 Study Results – Research Findings

Analysis of interview data generated one core category, 'information and health decision-making', and three main themes, "information and decisions", "information and sharing", and "information and seeking". The Information and Decisions theme is informed by participants' descriptions of what they actually did related to their critical incident situations. The Information and Sharing theme is based mainly on critical incident discussion but includes participants' comments about their information behaviour in general. The Information and Seeking theme is informed mainly by participants' comments about their information behaviour generally. These themes are presented diagrammatically in Figure 4-2 and used to organize study findings.

Where individual critical incidents are identifiable, they are supported with generalized descriptions rather than quotes to preserve the anonymity of participants. To help preserve confidentiality, when verbatim quotations from interview transcripts are included, participants' have been identified in groups by organization chart level and portfolio: Junior Leader, Manager, Director and Senior Executive are 1, 2, 3 and 4, and Acute Care, Administration, Community Health and Operations are A, B, C, D respectively. Some quotations note whether the participant is a career or hybrid manager or number of career years.
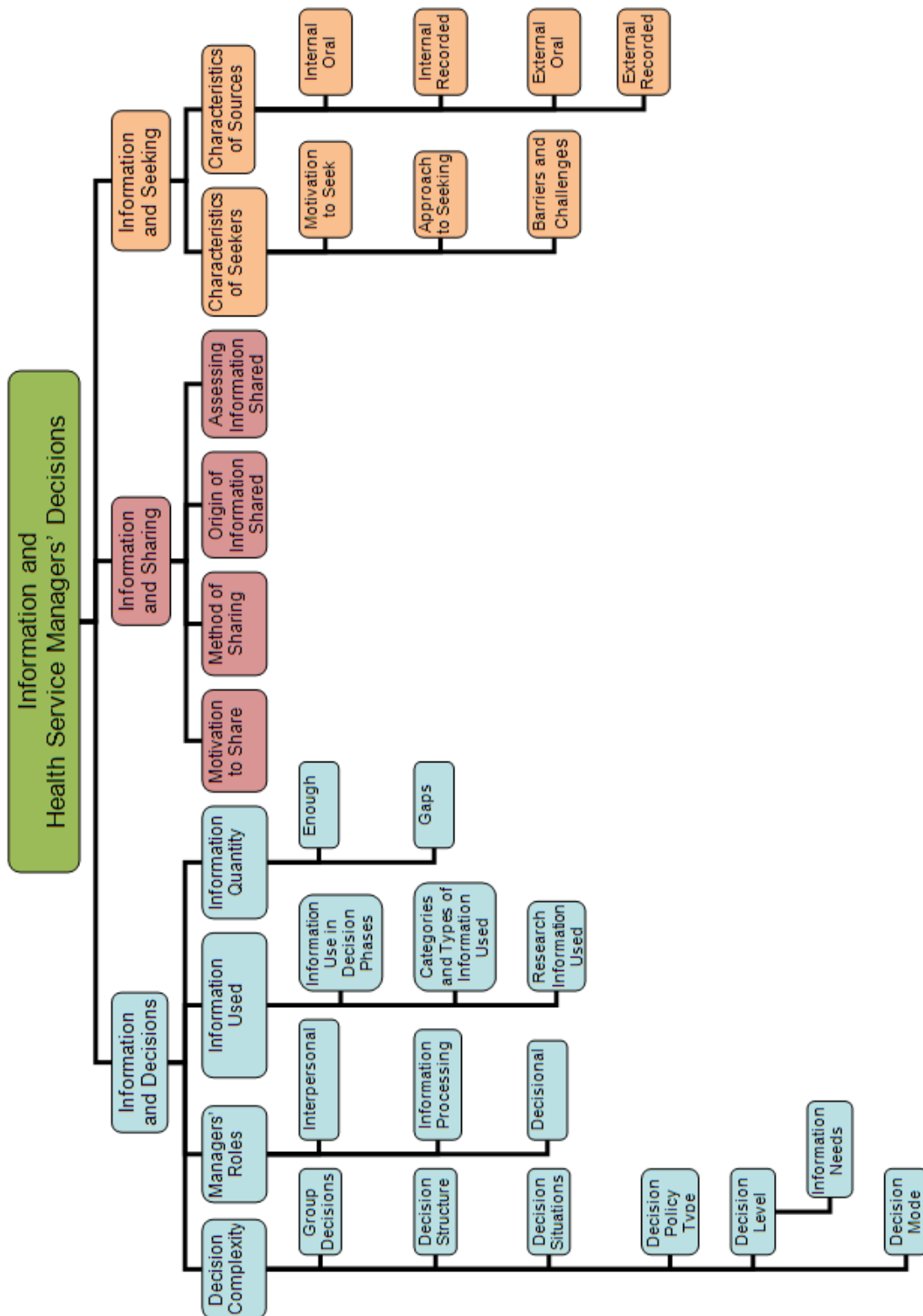
Figure 4-2 Thematic Diagram for the First Interview Study

Three additional utilities are used:

1) Parentheses [ ] are used around text that has been generalized to preserve participant anonymity

2) Ellipses, i.e. "…", are used to represented additional text removed without changing context

3) To preserve anonymity, quotations from the Governance Board participant have been flagged as Senior Executive, and quotations from the Community Health Board participant are flagged as Junior Leaders in the Community Health portfolio.

4.5.1 Information and Decisions Theme

The first theme, 'Information and Decisions' explores critical incident discussion to help meet the study's first objective, to understand work related information needs in the context in which they arise. Subthemes include decision complexity, participants' work roles as managers and Information gaps, whether these were caused by participants' behaviour or by information quantity problems.

This theme begins with discussion of decision complexity as a work related information need. An understanding of the information needs that arise within health service managers' workplace and the nature of their work environment is required to effectively design information systems and services for them.

Decision Complexity

Decision complexity was considered within a framework developed from literature review including individual or group decision, decision structure, policy decision type, decision levels, decision modes, and decision situations. Complexity of critical incident decisions was examined using cross case analysis with respect to portfolio, position level on the organization chart and years of health experience, summarized in Table 4-6 and discussed below.

Position Level	individual/ Group	Decision Situation	Policy Type	Decision Levels	Decision Mode	
					Goal(s)	Process
Junior Leader	Group	Problem, Opportunity	Administrative	Operational	clear	unclear
Junior Leader	Group	Problem	Public	Tactical/Strategic	unclear	unclear
Junior Leader	Individual	Problem, Opportunity	Administrative	Operational/Tactical	clear	unclear
Manager	Group	Problem	Administrative	Operational	clear	unclear
Manager	Group	Problem, Opportunity	Administrative	Tactical	clear	clear
Manager	Group	Problem, Opportunity	Administrative/ Public	Operational/Tactical/ Strategic	clear	unclear
Manager	Individual	Crisis	Administrative	Operational/Tactical	clear	clear
Manager	Group	Crisis	Administrative	Operational	clear	unclear
Manager	Individual	Problem	Administrative	Operational	clear	clear
Director	Group	Problem, Opportunity	Administrative	Tactical	clear	clear
Director	Group	Problem	Administrative	Operational	clear	unclear
Director	Group	Problem, Opportunity	Administrative	Operational	clear	unclear
Director	Group	Problem, Opportunity	Administrative	Operational/Tactical/ Strategic	unclear	unclear
Director	Group	Problem, Opportunity	Administrative/ Public	Tactical/Strategic	clear	unclear
Director	Group	Crisis	Administrative	Operational	clear	unclear
Director	Group	Problem, Opportunity	Administrative	Operational	clear	clear
Senior Executive	Group	Problem, Opportunity	Administrative	Operational/Tactical/ Strategic	clear	clear
Senior Executive	Group	Problem, Opportunity	Administrative	Operational/Tactical/ Strategic	clear	unclear
Senior Executive	Group	Problem, Opportunity	Administrative	Operational/Tactical/ Strategic	clear	unclear

**Table 4-6 Critical Incident Decision Complexity by Position Title.
Colours highlight cells with the same content.**

One factor contributing to critical incident complexity was the need to make the decision or solve the problem as a group. Most participants referred to their decision as a group decision, either directly or indirectly.

I did not feel that it was my decision to make alone... (Participant Group 3-A)

So we had a group of 5 people from across the province meeting with consultants that we have hired and looking at what are the options out there, how could we perhaps go about having a framework for addressing policies at a provincial level instead of at a district level. (Participant Group 4-B)

We physically sat down together and everyone brought something quite different together and we all walked away last Friday thinking even if this isn't a go we have a better understanding of what we need for a [health service area] in this province -we now have a better understanding of what each other brings to the table and it is quite good. (Participant Group 3-C).

In the one case where a critical incident decision made by an individual crossed department lines and would have affected the nature of work in other departments, the participant relied on a group to refine and implement the decision.

> *The decision has been made and they will be on side with it … So this is a decision I made most recently… then I thought maybe I should meet with a group of nurse managers and then collectively we can work on establishing the next step. (Participant Group 1-B)*

In rare cases, participants described decisions they made as individuals that involved innovative ways to address staffing shortages in their own departments. These decisions did not have an impact on other departments' work or resources so there was less of a need for group input.

> *…so I took it upon myself given the fact that we do have this abundance of technicians … what I actually did was a twofold process. I changed the hours of work the technicians worked and changed the hours the [professional staff] worked. (Participant Group 2-D)*

Critical incidents were considered with respect to decision structure. Participants were asked to discuss a *critical* decision, so no cases involved a structured decision, supported with either policies or guidelines or similar to that encountered before. As all participants described unstructured decisions, decision structure was not listed in Table 4-6.

Critical incidents were considered as to whether the decision situations were opportunities, problems or crises (Mintzberg *et al. 1*976). By definition of critical incidents as explained in the interview invitation, *decision situations* were perceived as "high stakes" by participants. Some were situations prompted by crises that had to be dealt with immediately. No decision appeared to be just an opportunity decision, but in keeping with the number of cases with manager's role classified as improver/changer, most cases involved problem decision situations that provided an opportunity to make progressive change. Only Managers and Directors described decisions that the researcher classified as crisis decision situations. Participants at the highest position levels, Senior Executive, and the lowest, Junior Leaders, did not describe crisis decisions. Further research would be needed to determine whether crises in health services are generally handled by Managers or by Directors.

The researcher examined critical incident decisions with respect to the type of policy that existed or would be needed to support them or might subsequently be generated from them, whether public policy, clinical policy or administrative policy (CHSRF, 1998, p.2). No case involved a clinical policy decision. Cases were related to either public policy or administrative policy with administrative policy dominant.

Public policy decisions involved changes to health service delivery within the community health portfolio, including a new province-wide approach to a core health service, a more holistic, family and patient centred care approach to a district-wide patient care service, and expanding a successful health services-elementary education partnership from schools to hospitals. No

relationship between policy decision type and participants' level on the organization chart was suggested.

Each critical incident and the main decision involved in each were examined holistically within a framework of components of definitions for strategic, tactical or operational decisions levels (Harris, 1998; Heller *et al.*1988). As some decisions were clearly described by components of a definition for just one decision level while others could be described by components of definitions for two or more decision levels, working definitions were created for simple and complex decisions where *simple decisions* could be classified by one level, and *complex decisions* spanned two or three levels. Simple and complex decisions were examined with respect to information needs.

The most complex decisions were *operational-tactical-strategic* in that they dealt with identifying a strategy to meet an organizational goal, planning to meet it and then dealing with operational issues required to carry out the plan. Individually, these complex decisions dealt with establishing partnerships with other organizations to work together to improve quality and share resources, contracting planning to centralize clinical non-services to increase cooperation and effectiveness while freeing hospital space to allow clinical services to meet patient care goals, preparing a response to a consultant's recommendations to reorganize a branch of provincial health services, redefining the philosophy of a service area, and then reorganizing it, and resolving a staff grievance that was complicated by multiple stakeholder involvement.

Operational/tactical decisions dealt with planning to meet an identified organizational goal and then carrying out the plan. Individually, these cases related to increasing para-professional competencies in a department to compensate for a shortage of processional staff, making the workplace more appealing to current professional staff and potential professional recruits, and dealing with an identified need to change a process, then educate managers and staff to take responsibility and increase compliance with best practices and follow-up reporting in an area targeted for organizational improvement.

Tactical/Strategic decisions included addressing workplace health and supporting a population health approach through a healthier food policy in hospital cafeterias, and analyzing and interpreting existing community survey data to set community planning agendas.

Remaining decisions were either *operational* or *tactical*. No decisions were solely *strategic*. Simple operational decisions involved introducing systems and processes to gather information or to communicate better, meeting an identified need for additional staffing, investigating an air quality issue and changing an annual meeting venue. Simple tactical decisions included setting up guidelines for members of the organization to follow when publishing health information and

establishing a leadership framework to guide development and leadership within a clinical services area.

Results suggested two relationships, one between decision level and position level and one between decision level and policy type. All participants who were members of Senior Executive described complex operational/tactical/strategic decisions (Table 4-6). With one exception, participants at other levels who described critical incidents involving strategic decisions tended to involve public policy. Whether health managers at more senior levels in the organization are more likely to be involved in making or in approving decisions might be explored in further research.

Each critical incident was considered with respect to decision mode by interpreting participants' comments with respect to goal and procedure clarity, as well as whether and how decision-makers identified and selected between alternative courses of action. In several cases, participants followed clear processes for meeting identified goals, suggesting the *boundedly rational* mode of decision-making. However, other criteria defining boundedly rational decision mode were not obvious, including that alternative courses of action and their consequences were identified, or that selection criteria were established with alternatives compared or evaluated. A fourth factor describing boundedly rational decision-making, that choice was guided by performance programs or established responses to recurrent decisions (March and Simon, 1958) would not be expected in unstructured decision situations.

In other cases, procedures to reach goals were unclear, suggesting the *process mode* of decision-making (Mintzberg *et al. 1*976). In cases where the problem situation was external to the organization, participants were unclear about both the goals and the procedures to achieve them, suggesting an *anarchic mode* of decision-making (Cohen *et al. 1*972). There were no cases that followed the *political mode* of decision-making where procedures were clear but goals were obscure or conflicting (Allison and Zelikow, 1999; Allison, 1971).

Cases matched primary criteria for *naturalistic decision-making* (NDM) in several key areas. One such criterion was that almost all participants described group decisions with reliance on experience and expertise to inform the decision.

> *So we brought together a cross section of people from across the district, the various sites, the various services, everybody including housekeeping, maintenance, physicians, nurses, the various departments that … provide services for/within the organization. (Participant Group 3-D)*

> *This is why I saw our group partnering -we are not experts in this area -we don't have the time, we are not in this field -we don't have the expertise -let's partner with people who know this stuff. (Participant Group 1-B)*

Participants tended to identify and consider options sequentially instead of selecting a range of alternatives, then developing selection criteria and comparing alternatives with each other.

> *I tend to draw on the range of my experience and move forward based on decision-making that comes from that. That happens much more I think than systematically lining up a range of alternatives, it relies on trust in my experience in my work. (Participant Group 2-C)*

All decision-makers dealt with time pressures in the midst of conflicting priorities.

> *…one of the things that I don't think we are really good at, giving people enough time to make decisions around certain things. (Participant Group 2-D)*

> *When I am looking at something like this, this is one of many, many things I am doing … (Participant Group 3-B)*

> *….there is so much work to be done and there is a limited number of people that are trying to get it done, or trying to coordinate it right because there are so many priorities; everybody has too many priorities (Participant Group 1-A)*

NDM decision-makers also rely on situation matching and story-telling to resolve uncertainty. Situation matching occurred in a number of cases, as did anticipating the decision outcome and imagining what might happen.

> *I will ask around a bit and another guy might say "Well look, you know I have been working here for the last 20 years and here's what is going to happen'. (Participant Group 3-D)*

> *The first being the fact that there was a hospital in New Brunswick, a friend of mine who runs it says it worked. (Participant Group 2-D)*

> *Personally, my preference would be through a story, because it makes the connection back to what is real and it is better than I can explain it that way to people. (Participant Group 1-A)*

NDM decisions are characterized by unclear goals (Lipshitz *et al.* 2001). Participants were clear about their goals, so cases did not correspond with NDM in this one key area. In all other respects, the decision mode that best matches these participants' approach was NDM. Transcripts were examined to determine whether there might be a relationship between decision mode and participants' portfolio, position level or number of health services career years but none was suggested.

These findings relating to decision complexity are exploratory and descriptive. Critical incident decision situations that study participants described were complex, involving problems that participants had not encountered before. Complexity is one characteristic of a dynamic environment (Laufer *et al. 2*008). Most situations involved groups either to inform to the decision or to make the decision. These findings may be useful in designing information products and services to meet needs of health service managers.

Managerial Roles

This part of the chapter looks for similarities between health service managers and managers in general with respect to managers' roles. Participants' activity in their decision situations were considered with respect to managers' role and found to be heterogeneous, spread throughout Mintzberg's three broad categories of interpersonal, information processing and decisional roles (Mintzberg, 1973).

Interpersonal roles arise from the manager's position of formal authority in the organizational hierarchy and include being the figurehead, acting as liaison with other units inside and outside the organization, and leading the department or service. *Information processing roles* include monitoring information to identify new information relevant to departmental operations, disseminating information from within the department to those outside, and information from outside the department to those within, and speaking for the department. *Decisional roles* are improver/changer, resource allocator, disturbance handler, and negotiator.

Within interpersonal roles, there were no cases where the decision-maker's role could be categorized a*s Figurehead*. In keeping with the definition of critical incidents, participants' roles were practical in these cases rather than ceremonial. Cases where the decision-maker was in the *Leader* role, ensuring that the department functioned to best meet both service and staff needs, were dominant.

> *…and maybe my staff don't like working after 3:00 in the afternoon, but I have to provide that service, so there is no way around that … it does mean that I lose my staff, they go to other jobs, and I have a large turnaround …but I just can't just shut [the department] down after 3:00. (Participant Group 2-D)*

In a number of cases, participants took the role of *Liaison*, functioning as an information exchange centre.

> *And I just started sharing that information with other people in the district who were impacted by this -Lab Managers, Registration Managers, that kind of staff and the meetings started to grow as more people saw it -and information started coming in from all groups. (Participant Group 2-D)*

With one exception, cases fell broadly into three of the four Decisional Roles for Managers. No participant described a role that would be categorized as *Negotiator*. The role of *Improver/Changer* was common, suggesting that decision-makers control change within the organization.

> *… so [I] have been involved in that whole new program which is based on research that has been garnered on what children need to have a healthy early childhood. So lately, that is what I have been doing. (Participant Group 3-C)*

The role of *Resource Allocator* was also common.

> *Certainly I had spoken to my supervisor and said we will require extra staff to get through this and this is what I will be doing so that -he was fine -I think it is my budget. (Participant Group 2-D)*

Several cases could be categorized with decision-makers in the role of *Disturbance Handler:*

> *You know, we would get a call at eight o'clock saying "well, we are ready for the equipment to **be installed … there is nobody around", and we would have to go [start from scratch] get** them sent over there. As I say, over a period of two weeks it got out of hand. It started off the occasional one, then was getting more and more frequent. (Participant Group 2-D)*

Within information processing roles, the role of Monitor was recurrent, suggesting that participants look for and receive information to evaluate situations and the organization's performance.

> *So that people are reporting to us what almost happened, and consequently … we are able to introduce change to processes so that it won't happen. Thereby diminishing risk to the patient. (Participant Group 3-D)*

Several cases involved participants at higher levels on the organization chart in the role of *Spokesman*, providing information and working to develop strategy with external organizations.

> *…the question was raised by me at a provincial [meeting of senior executive], because it seemed to me that we were doing a lot of duplication of effort and there should be some way or some method that we could perhaps pool resources and be more efficient. (Participant Group 4-Administration]*

> *At the same time I was just getting involved with this where I thought it wasn't too complicated I received a call from the Department of Health saying that there had been a complaint going to the Premier's Office so we were being asked to address it. I then had to … talk to the Premier… (Participant Group 3-B)*

The two participants who were volunteer board members, not paid employees, described their own role in critical incidents in ways that could not be easily classified within management roles. In remaining cases, similar to Moahi (2000), health service managers were similar to managers in general with respect to their roles. The findings suggest that systems and services designed for managers in general may also be useful for these health service managers. Further research is needed to determine whether systems and services designed from LIS research conducted on individual scholars would be useful for these participants.

Information Used

This part of the chapter examines the information used to inform critical incidents. It begins with a discussion of how information was used, then looks at when information was used, what information was used and whether research information was used.

Transcripts were examined for descriptions of how participants used information to inform their critical incident within a framework developed from three information use perspectives: Simon's (1978) four broad classes, Taylor's (1991) eight classes of information uses, and March's (1994)

three classes of attention and search. Among all categories used to describe how information was used, those where information was used to examine the system and its environment before taking action (Simon, 1978) were dominant.

Examining the system and it environment was a step in the first phase of decision-making, as noted below in results related to Decision Phases. Almost all participants indicated that they spent time early in the decision process examining the system and the environment. They did this by considering the issue and looking for information to supply context.

> *I guess the first thing would be … looking at the increased amount of time that it would take … And then determining where we needed extra staff at what time … we looked at what normally we would do without the project … and what was happening after midnight and how we were going to cope with that. (Participant Group 2-D)*

> *… We rolled this out [in three service units]. So I work with those two [service] managers …We sat down and we looked at the data, basically, and compared results from [one health care centre to another], [professional] to [paraprofessional]. (Participant Group 1-A)*

Information was used to determine the exact cause of the problem, as suggested in the following quote about a crisis decision situation where determining the cause appeared to be a major part of the critical incident.

> *Just again, for discussions what are we going to do … we certainly wanted to give the impression to staff that we were doing something, we just didn't know what the source was so we couldn't find a resolution... I said we didn't do research -but we had information from past experiences, what ifs, and so forth. (Participant Group 3-D)*

In this case, the participant appeared to expect that once the problem was identified, it would be resolved with information already on hand, or knowledge gained through experience.

In one case, where the problem had been identified, information was used for enlightenment, to help understand the context of the problem (Taylor, 1991).

> *You have to … know what your answer needs to be -you have to understand the context in which the question is being asked, the context in which the answer must be given. (Participant Group 2-D)*

In some cases, participants used information to help in problem understanding (Taylor, 1991). Many participants used or searched for factual internal information:

> *We have a [province-wide MIS for our service] so that gives us quite a bit of information, both in terms of provincially, comparing ourselves provincially around utilization. Also we are able to because we have our own application analysts -we are able to look at staff to staff and drill down to cases to see what kinds of cases we are getting -are they really more complicated - we are saying they are more complicated. (Participant Group 3-C)*

> *.. it wasn't specific information but we looked at what normally we would do without the project -how many charts did we have to retrieve and take to the emergency department, the number of admissions we were having after -say 3:00 pm in the afternoon -and what was happening after midnight and how we were going to cope with that. (Participant Group 2-D)*

> *An inventory first in terms of what are we, what does it look like. The purpose of that was to see … things we were expected to do or … other ways that would be more efficient in approach it. (Participant Group 3-C)*

No participant reported using information to develop an organizational scorecard or report card evaluating their organization's health (Simon, 1978). There was no indication that new information was sought to investigate consequences or explore preferences. Components of March's theory of attention and search (March, 1994) were not represented including alternatives being sought, consequences be investigated and preferences being explored. These have already been discussed above in the Information and Decisions Theme.

The rest of this section describes results in three areas: information used at steps in the decision process, information that influenced decisions and whether research information was used to inform decisions. The Section begins with a report of analysis of information used at steps in the decision process.

Information Use During Decision Phases

This part of the section addresses a second research objective, to determine whether there were key points of information activity during the decision-making process. The focus is on action or behaviour at steps in the process. Discussion includes whether information used at a particular step was internal or external, oral or written, or explicit, tacit or cultural and whether any information search behaviour was active, passive, trap or organizational memory search (Mintzberg *et al. 1*976).

To help meet this second objective, data were pooled for all participants and examined as a whole. An ATLAS.ti^TM family was created from Simon's four (1977, 1960) phases of decision-making by a rational mind: Intelligence, Design, Choice and Implementation (Simon, 1977), discussed in Section 2.4 and three phases identified by Mintzberg *et al.* (1976) identification development and selection

Twenty concepts from the initial Conceptual framework (Table 4-3) were placed as steps within the four phases. The resulting categorical diagram shown in Figure 4-3 represents the ATLAS.ti^TM Decision Phases family used to index information mentioned during critical incident discussions. This information had already been indexed as internal or external, as oral or recorded, and as explicit, tacit or cultural (Choo, 2006; Polanyi, 1966).   Information mentioned as wanted but not accessed was indexed as a gap and is discussed further below.
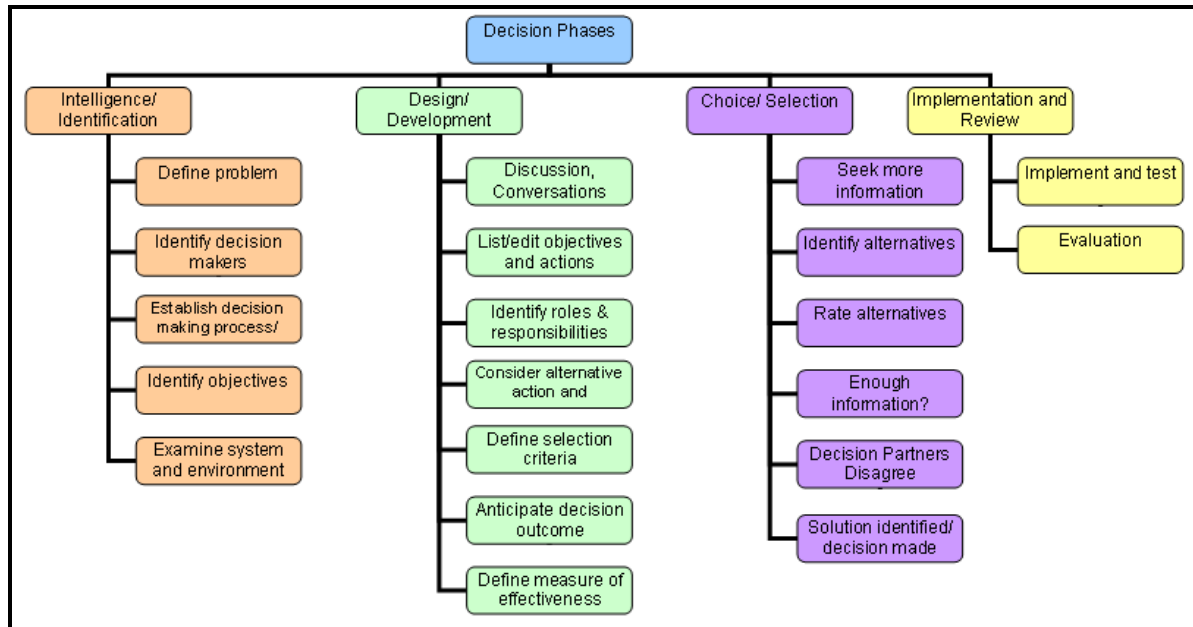
Figure 4-3 Categorical Diagram for Knowledge and Information Use within Decision Phases

The rest of this part of the section discusses where information was used within each phase in decision-making (Simon, 1977; Mintzberg et al. 1976) at steps as shown in Figure 4-3, developed from research as listed in Table 4-3. Substeps do not appear in the diagram.

Decision Phase 1, The Intelligence/Identification Phase

Participants described searching their own organizational memory to quickly assess and define their critical incident consulting interpersonal sources.

> *…So I saw that as a huge need because it is a real risk issue within an organization -not to know what is happening and what is happening about it. (Participant Group 3-D)*

In one divergent case, there was a need to probe further to identify the exact nature of the problem.

> *…we went through the situation -obviously there was a problem amongst us. (Participant Group 2-D)*

A participant who identified the need to address a critical incident situation herself, discussed it first with one nurse manager, then involved others in determining what to do and when and how to do it:

> *I am trying to implement a [named] program, and wanted a formal process for the next step … I talked to one nurse manager who is really good to bounce ideas off of and she thought the same way… so I was just going to meet with her and then I thought maybe I should meet with a group of nurse managers and then collectively we can work on establishing the next step. (Participant Group 1-B)*

Once the problem was identified, the decision typically became group work informed with internal information. Much of the information used to inform the decision was gathered from co-workers in group settings where each contributed their own or their department's perspective to the collective pool of information. Issues that individual participants identified became group issues. Participants mentioned bringing together decision partners early in their critical incident description. As suggested by the following three quotations, it appeared that sources were chosen because of their positions and the relevant information they were expected to contribute rather than because of relationships, as has been determined by other researchers (d'Alise, 2010; MacKenzie, 2005).

> So, bring the group together, and it was the group of managers, clinical resource, the usual people, and nurses who supervise students, so probably about 20. (Participant Group 3-A)

> So we brought together a cross section of people from across the district, the various sites, the various services, everybody including housekeeping, maintenance, physicians, nurses, the various departments that … provide services for/within the organization. (Participant Group 3-D)

> So in this whole process, we had the staff involved in the department, we involved the health and safety committee, we brought in the occupational health nurse and I guess she doubles as infection control so we had both sides there. (Participant Group 3-D)

Internal interpersonal sources that were likely to know about a situation included participants' staff and supervisor and others internal to the organization. Most participants had staff who reported to them. In two cases, where critical incident decisions were to reassign or reallocate staff within the participant's own department, staff were involved in providing information about the situation that led to problem identification. In other situations, participants rarely made direct reference to their own staff as sources of specific items of information to inform decisions. A common approach for these participants who managed staff was to use the pronoun "we" when referring to information that most likely came from their front line staff:

> We ran into a number of problems very late in the game before "go live". (Participant Group 2-D)

> We were continuously behind the eight ball all day long which meant that you never left at the time you should have at 4 o'clock, and you never left at 5 o'clock because you were there from 4 to 5 on your own and you were so far behind From the day that you could never catch up -we never left this department until a quarter to six, every single day, it never failed. (Participant Group 2-D)

> …knowing that [named departmental process] would change and take longer. It is not always going to take longer - we don't know from one patient to the next, how much longer. If you have never been in the facility before you have to do a [additional named process] and that will take anywhere from 5 to 20 minutes. (Participant Group 2-D)

The next step described by some was to identify the process that would be used to reach a decision. No participant referred to a specific named decision-making framework or process in

critical incident discussion, but in responses to exploratory questions some spelled out how they typically approached group decision-making.

> *So we will start there, and then look at what the scope of what the issue is, as to who is impacted and who is involved in the decision or the process, who do we get information from - we look at the ripple effect -this is what the issue is, but who else is impacted, as no decision is made in isolation. (Participant Group 3-D)*

> *When you start to talk about how did you make decisions -what does it look like … it is probably a combination … not different from many models with names on them … includes what are the issues, the problems the outcome…[what we are] hoping to resolve, then information gathering, then it would be sort of trying to look at potential solutions, actions, whatever, then stop there and kind of weigh them -weigh them all together or separately, probably another bit of reflection, implement, monitor how it is going in terms of the initial outcome, be flexible enough to change or redirect, in some instances I think probably go through that process fairly quickly depending on the situation or issues or whatever and your kind of own experience or expertise in other situations. (Participant Group 2-C)*

Others suggested they did have a process for making decisions, but did not identify what it was.

> *…to get to the decision that one wants … the majority of the time is spent orchestrating the process. (Participant Group 4-B)*

One participant explained why a specific decision-making process or framework was not used.

> *... so every time you have to make a decision you have to think though all kinds of "what ifs". It is not like a technical thing, where it is like "this is the way you do it". It usually is not that kind of decision-making -for people who are trained [in a specific decision framework] they have problems sometimes trying to factor in all of the information you have to factor to make a decision. It is very complicated. (Participant Group 3-C)*

Some participants then mentioned identifying decision objectives, drawing on internal tacit information.

> *[We] did sit down and develop basically the purpose of it, what our objectives would be -all of those kinds of things, to make it more formalized. So we did all that. (Participant Group 1-A)*

Almost all participants indicated that they spent time early in the decision process examining the system and the environment, as discussed at the beginning of this section.

Throughout Phase 1, internal oral information was used most often to inform the decision-makers at each step. It appeared that more tacit information related to roles and positions and cultural information about the organization was used. There was little mention of information that could be described as explicit, and no mention of research information. The dominant behaviour appeared to be information seeking.

Decision Phase 2, The Design/Development Phase

As a first step in Phase 2, the Design/Development phase, most participants described having discussions about their critical incident with people likely to know about the subject. There was an emphasis on internal tacit information.

> *Probably my first approach to information gathering is to talk to people. Ask people things - people say things … that would help us move this process along in a more efficient way - those conversations with people in the decisions that I make matter very much. (Participant Group 2-C)*

> *We had the present clinical manager, the Medical Director, and [our] policy and planning committee where those individuals [are] there but also the facilitators, who are the staff reps in terms of each of the teams. So the discussions would have happened there. (Participant Group 3-C)*

One objective in such discussions was to identify what had been done in similar situations. If participants were not able to get information from similar experiences internally, they consulted counterparts in other organizations. No participant mentioned purposefully searching the research literature. If their interpersonal information sources had used research-based information themselves in addressing previous situations, it would have been synthesized along with those accounts and delivered orally, not as a list of articles from a search through databases.

> *So basically what we have learned we have gotten through discussions with other people who have done similar type of work …going to meetings … networking what did they use … gather information from other people as to what they used for sources would be a big part of it. (Participant Group 3-C)*

> *Some of it from conferences, some we already had -some of it we got from bringing people together, someone from community nursing at [closest Nursing School who] could speak a lot to the national picture – [another staff member] and myself -even having that kind of dialogue generated information on its own. (Participant Group 3-C)*

Others described how they informed their decision with information recycled from other work and other decisions.

> *…So it happened … that was work that I had done, it is part of who I am so I would have had it ... so I did not have the time and did not make the time I guess to actually do the up front, all of that work prior to that. So if I didn't have it in my head it wouldn't have been quite so easy. (Participant Group 3-A)*

> *I used information over again, that I had for employee orientation, and employee education, stuff about [this topic] doesn't change. (Participant Group 1-B).*

Some participants indicated that, as they started to discuss the issue with their information sources and partners, they reconsidered what they were setting out to do, and in some cases revised their objectives. At this point, internal cultural information was used.

Once we have identified those constraints, we come back and say "look, here's why we can't do what you want -so let's find out, what can we do to achieve that, how do we work around the constraints. (Participant Group 3-D)

We started off thinking that was going to be an electronic tool -but it [was] probably not going to work best as an electronic tool -we are going to actually be giving people pieces of paper that they would use, take home, whatever …I didn't realize, that we would be using paper, thought it would be totally electronic. Once we got going, we saw the issues with that. (Participant Group 3-D)

Participants who were addressing an issue as part of a group noted that they identified roles and responsibilities within the group. Again, internal, mostly tacit, information, was used.

The first step was to look at the Manager and myself in terms of what are our roles and responsibilities and what are the actions expected of us. (Participant Group 3-C)

We actually met and talked about what competencies do we have and what don't we have. Who is going to take on what to try to update. So we did that and looked at all the old stuff that had been out there. (Participant Group 1-A)

So we had an external facilitator actually facilitate the group -so at the end of our first meeting we worked through the roles and responsibilities and qualities and we got really good information on that …(Participant Group 3-A)

Others self-identified their own role in the issue

I felt my role in this scenario was initially to talk to some of those other stakeholders and I also talked to some of the community health board people themselves who had some concerns - so I did a polling of them around the issue. (Participant Group 2-C)

Participants mentioned that they considered decision partners' experience and expertise when determining roles and responsibilities. Most referred to either their own experience or that of their decision partners using internal tacit information.

I would have to know the background -that is where experience comes in. If it is in an area where I have a fair bit of experience in terms of practice, then I might judge and feel competent to kind of judge them, and say well, the evidence here on the internal piece based on my experience and what I know happened in behind the scenes would be enough to help me validate it. (Participant Group 2-C)

That is something that I would have done, and several other staff equally familiar so we had that shared experience. (Participant Group 2-C)

Direct mention of research information in Phase 2 explained choice of alternate information sources.

We didn't do a real thorough search. A lot of our reaction is based on past experience because [the subject] is a hot topic these past couple of years. And immediately so we started thinking well, what did we do in the past and what have been the reasons and the resolutions (Participant Group 3-D)

Individuals noted whether or not they had expertise in an area, or whether the group had assets in terms of expertise. Participants seemed to be realistic with respect to assessing their own

expertise. They appeared to share and use internal tacit information to determine what they did not know and what expertise they needed.

> *Now I have [responsibility for overseeing an additional health service area], and it is not my area of expertise. I have spent time in the last few years improving my expertise. So I have been trying to keep up in that but certainly I haven't been able to keep up in [another health service area]. (Participant Group 3-C)*

> *…once we had a viable solution and a rough enough plan then …acquire the technical expertise to advance it -so it is was either a go or no go … If you don't have the expertise in house you go buy it. (Participant Group 4-B)*

> *So we went a step further and brought in the Department of Labour and sat down for discussions - hear what we did, we need your help, give us some direction...And they sent up one of their industrial hygienists who worked with [the problem] off and on. Actually, we had the Department of Labour in for three days I think, three or four at least, just to share information. (Participant Group 3-D)*

In all critical incident descriptions, congruent with Naturalistic Decision-making (Lipshitz and Strauss, 1997) participants described selecting one course of action and beginning to work with it until they identified a problem with it. At that point, they would identify another solution then work with that one. No participant described systematically identifying and then considering and comparing alternative courses of action and their consequences, a key feature of rational decision-making*.*

Again, in discussing the critical incident, no participant suggested that they or the group identify selection criteria to use in comparing and selecting between alternatives, or standards to use to evaluate alternatives. There was no discussion of evaluating alternative actions against previously established criteria.

In one step in the second phase of decisions, participants described how they anticipated the outcome of the decision using internal tacit information.

> *But I try to hone in on what the result is going to be because if it is not going to be a good solution to provide the desired result then I tend to reject it early on. (Participant Group 2-D)*

> *So I try to weigh it out, I will hear one expert's opinion and sometimes it doesn't sit right and I will ask around a bit and another guy might say "Well look, you know I have been working here for the last 20 years and here's what is going to happen. (Participant Group 3-D)*

> *Oh, it most likely if we were to say "no" in this instance it will go to arbitration -and a provincial arbitrator will decide who is right. In this case the challenge will come if we said "no". I think most likely our decision is going to be yes … (Participant Group 3-B)*

In anticipating the outcome, some participants used situation matching based on their own earlier experiences or colleagues' experiences to guess what might work and what the outcome might be. Internal tacit information was used.

> *I will go with something that has worked in the past, will it work here? (Participant Group 2-D)*

> *The first being the fact that there was a hospital in New Brunswick, a friend of mine who runs it says it worked. (Participant Group 2-D)*

> *If it was similar to something that happened in another life, well yes, I would compare similar instances. (Participant Group 4-B)*

Related to anticipating the outcome, one of the exploratory questions was whether they would work to support an outcome they wanted or to avoid an outcome that they did not want. Only one participant indicated they would work to avoid an outcome that they did not want using internal, cultural information.

> *I tend to want to make things harmonious, so avoid an outcome that would cause upset (Participant Group 2-A).*

Aside from this exceptional case, all participants who answered this exploratory question during general discussion stated that they would work to support an outcome they wanted.

> *Supporting an outcome that I want. And if I didn't answer that question that way I shouldn't be sitting here. I feel very strongly about that. (Participant Group 4-B)*

> *I would probably focus on an outcome that I want -an outcome that I did want in terms of the best outcome, not just personal. (Participant Group 3-Public Health).*

> *I think … unconsciously I am supporting an outcome that I so want, but if I find within the literature that my hypothesis or my thinking is wrong, then I would research a bit more to see. (Participant Group 1-B)*

No participant mentioned processes by which they defined measures of effectiveness so they could later evaluate the outcome or effectiveness of their decision. Participants appeared to rely on internal information shared orally, slightly more on internal tacit information in Phase 2 than on cultural information. In rare cases, though there was a slight interest in external, research based information, it was filtered through people's experiences and not necessarily used. Information sharing appeared to be the dominant information behaviour in Phase 2.

Decision Phase 3, The Choice/Selection Phase

Information sharing activity continued in Phase 3. Some considered what they knew themselves; others described unsuccessful active searches (Mintzberg *et al.* 1976) for written, explicit, internal information such as policies and procedures. In the second of the two quotations below, the participant moved on from an unproductive search for written, internal information to search briefly for external information and to a mediated literature search for published information, subsequently also revealed to be unsuccessful.

> *… [the previous manager] had tried things like this and I knew that he had … but …there was no policy and no procedure for me. (Participant Group 2-D)*

> *I looked through our policy and procedure manual for the district to see if we had anything -in fact, I started there, I looked to see if we had anything that provided guidance and there was*

> *nothing. Then I did some internet looking. I didn't go very far, that is when I started talking to our library staff and realized that they could provide expertise there in terms of doing some searching around what else was out there. (Participant Group 2-C)*

No critical incident descriptions referred to considering and evaluating two or more alternative solutions. In most cases, one way forward had been identified as a solution and participants and their groups focused on that until something happened to suggest it was not a good solution. Rather than selecting from alternatives, the emphasis was on sharing internal cultural information such as details of similar situations that had occurred before, whether the same approach might work again, and whether employees were likely to support it   Participants considered the likelihood of success of the solution they had identified and noted the importance of getting co-workers' opinions on issues to secure buy-in to move forward, using internal, cultural information, as suggested by the two following quotations. In the second example, the participant used internal cultural information to help decide whether to continue engaging in the situation.

> *…it would make it much easier to move forward with change if you have concrete answers, work to share with people. So what I wanted was to be able to have that policy draft and then be able to take it to the next step, to the people that [I] would trust, who would have good information, in terms of influence, in terms of procedure, to have it adopted. (Participant Group 2-C)*

> *And I think when you want to make a change, even though you have all of the information, that you could have moved forward 5 years ago with it … if it is not broadly accepted… it is very hard to affect an overall change. … there has to be some kind of buy-in from people… I have done enough things in my past when the timing wasn't right……if the senior leadership in an organization doesn't understand the information, … hasn't had time to digest it and absorb it and agree with it, it will bomb." (Participant Group 3-C)*

When asked as one of the exploratory questions, whether they tended to compare or evaluate alternatives, participants' responses did not reflect their descriptions of what happened in their critical incident situations where options were considered sequentially. Some participants said they would look for a range of alternatives to compare while others said they would identify just two alternatives to compare or evaluate.

> *I would probably … start from more of a general kind of request that might give me different options. And then look at them. (Participant Group 3-C)*

> *I think I would try to evaluate separately, but I don't think that I do -I think that if there are two alternatives I think by its very nature I start to get into comparison. (Participant Group 2-D)*

> *I like to look at them individually so I can give them the full attention they require. And then we go back and look -"what is significant about each one " -and then we go back and say "are there overlaps" so we have the comparison pieces of it. (Participant Group 3-D)*

> *I think that inherently once you look at one, you are comparing them. And sometimes I will actually figure out the points that I might be looking for and then I will look at them all in a group. (Participant Group 4-B)*

In response to a subsequent probing question, some participants justified why they did not first identify and then compare or evaluate alternatives.

> *Well generally, I am working from information that is already in front of me -it is provided in some form. Usually the best option presents itself through that information. Or the preferred option -I am made aware of that by staff. (Participant Group 4-B)*

> *I tend to draw on the range of my experience and move forward based on decision-making that comes from that -that happens much more I think than systematically lining up a range of alternatives, it relies on trust in my experience in my work.(Participant Group 3-B)*

At this point in analysis of critical incidents, when transcripts indexed for the step *enough information for comfortable decision* were examined, a surprising number of participants commented that although they did not have all of the information they wanted, they had enough to make a decision. This phenomenon was noted for further examination and is discussed in Information Quantity, below. Participants differentiated between the information they wanted and the information they needed and were clear about the two.

> *I think that we had everything we needed. (Participant Group 3-D)*

> *I guess, right or wrong, we thought up front in terms of what information did we want to gather -and we did gather that information -and all of those points and directions -so we really didn't have a felt need to go further.(Participant Group 3-C)*

> *I think… we had enough to be able to articulate some valid options. (Participant Group 3-C)*

Almost all participants described groups working harmoniously by the time they arrived at steps within Phase 3, with facilitators used in the two cases where there was disagreement.

> *What I saw at our last meeting with this facilitator, [those] involved in this process seemed to be quite protective and defensive, even though …those of us ... who had concerns, tried to be quite supportive and bringing it up in a good way, but this was very difficult for [others] to … listen to and accept -it was kind of pooh-poohed… (Participant Group 1-C)*

> *…we had an external facilitator … so at the end of our first meeting …we got very diametrically opposed …and we had very loud voices…no they didn't want to take a vote, so we came back together a week later and talked again about what are the pros and cons so at the end of the day … [we resolved it] to everybody's satisfaction. (Participant Group 3-A)*

Watson's Decision-making Agenda (Watson *et al. 1*988) included a *vote or straw poll.* This was a step in Phase 3, but no participant described using this in the decision-making process.

Participants in problem-opportunity decisions who had identified information gaps in Phase 2 looked for additional information in Phase 3 Choice/Selection to use to make positive progress beyond solving the problem.

> *I talked to one [manager] …and she thought the same way … so I was just going to meet with her and then I thought maybe I should meet with a group of [managers] and then collectively we can work on establishing the next step. (Participant Group 1-B)*

Again, internal information appeared to be used in Phase 3 with a slight emphasis on cultural information over tacit information. It appeared that there was more concern with justifying the chosen course of action in Phase 3 than there was in selecting a solution. Although there was

occasional mention of external explicit information in Phase 3 no participant said it was useful or changed their course of action. Phase 3 information behaviours included both seeking and information sharing.

By the end of Phase 3 all participants, most with their groups, had already considered their own knowledge and had made a decision whether to engage further in the decision. They had decided whether they had enough information to make a decision or had identified information gaps and decided whether they needed additional information.

Decision Phase 4, The Implementation/Review Phase

Closure had not been reached in most critical incident decisions by the time they were discussed in interviews so not all descriptions included a Phase 4. A few cases included discussion of the decision being implemented.

> *It's done -it has gone to Human Resources. (Participant Group 3-C)*

Others had a clear plan with implementation imminent.

> *This is what I will be doing. (Participant Group 2-D)*

In some cases, the decision appeared to be in some form of hiatus, perhaps taking so long to be made that it no longer made a difference. Some participants who described decisions that had not been made by the time of the interview did not expect a satisfactory resolution.

> *I thought it seemed very simple; I am tired of this project. I will be honest with you; I am ready for the decision to be made and to move on because I just can't facilitate the change that is not ready to happen. It is all about readiness and timing as it is about knowing what could or couldn't work. (Participant Group 4-B)*

There were no comments that suggested the critical incident decision was being evaluated or would be evaluated. In no cases where a decision was implemented was there any indication that a systematic approach such as p*roject management* was used. Some participants specifically noted that they did not use the approach.

> *We did that project management workshop a few years ago -went well for the first few months, got out of hand …some of the tools … we need to be more focused on how we apply them. They are great workshops, we learn the principles, but again we have to be more focused on what we are doing. (Participant Group 3-D)*

> *Often I see managers who have gone to project management training sessions and see all the little stickies everywhere, I don't do that. I just don't, I don't go there. Maybe I don't always make the right decisions because I don't do that ... I guess it might sometime get you into trouble but I certainly do make gut feeling decisions. (Participant Group 2-D)*

Section Conclusion

Although decisions played out over days, weeks and months, data were taken from participants' memory not from observation, and pooled for all participants and examined as a whole rather than examined individually, it was possible to see examples of information activity at most key points in the critical incident decision process; it was also possible to identify points where information-related activity did not take place. These findings about information use through decision phases can be generalized to existing research in three main areas.

First, information activity takes place throughout the decision process, not just at the beginning, middle or end, or at key points marked by beginning or end of decision phases. This observation is congruent with Treacy (1981) who noted that "interpreted broadly, for almost all managerial activities which use information can be classified as some phase of the intelligence-design-choice-review decision process" (p. 5).

Second, participants who did describe information seeking to inform their critical incidents described organizational memory and active information search behaviours (Mintzberg *et al. 1*976) to inform decisions, support policy development, or translate tacit knowledge to educate and guide other health workers. There were no descriptions of information seeking to inform critical incidents that could be described as passive or trap information search behaviours (Mintzberg *et al. 1*976). It may be that time pressures associated with critical incidents precluded being able to wait for just-in-case type of information such as would result from passive and trap searches.

Third, research indicates that, in general, people prefer to get information from other people (Clark, 1998) and managers prefer internal, oral information sources (Jones and McLeod, 1986). These findings indicate that these health service managers were similar in this respect but were less clear whether information providers were decision partners or simply interpersonal information sources. A decision to bring a group together may suggest an expectation of two-way information sharing; consulting with individuals separately may suggest one way information flow.

More research is needed to determine how participants decided whether to ask a series of individuals for information or to call a meeting so members of a group could hear and build on each other's knowledge. The natures of group information sharing and of individuals as information sources are examined further in the Information and Sharing and the Information and Seeking themes, respectively. The next part of this section examines the information that participants mentioned when describing their critical incidents.

Categories and Types of Information Used to Influence Decisions

A research objective was to identify the information that participants used to inform decisions. This part of the chapter addresses the difference between internal and external information and then discusses the specific information that participants mentioned in critical incident discussion by category and type; these have been arranged in the categorical diagram shown in Figure 4-3.

During indexing it appeared that Krikelas' differentiation between internal and external information (1983) did not adequately capture the distinction between these, as described by participants and as discussed further and in more detail in the Information and Seeking theme. The following working definitions were developed for data analysis:

External information is information created outside the organization, consisting of research-based information, government reports and observations of what other organizations are doing gathered through visits, or reported by experts. External information has not yet been absorbed, applied, synthesized or translated.

Internal information is information created within the organization as well as external 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 health services or purposefully written as reports, meeting minutes, policies, or practice guidelines. With this working definition, internal information that was some form of organizational knowledge was dominant in participants' descriptions of critical incidents.

In discussing how decisions are informed, one participant referred to the importance of multiple information types shared by different hybrid managers:

> *…In health there is a lot of informal information that passes around back and forth that is interesting because that goes through your mind as well. And so how you make your decisions and the information uses a whole conglomerate of stuff that you use. I actually think that what we need in our information, that our leaders that we have in our organization that we need a much broader mix of professionals… there has to be a good broad mix of professionals because … if they are all trained in the same way it doesn't lend itself to having a broad view of life. So we have to be careful that we don't load all of the upper echelons with doctors and nurses. (Participant Group 3-C)*

Explicit Organizational Knowledge

Participants' decisions were influenced by explicit organizational knowledge, most of which was available to participants in written form, such as value statements, policies, legislation and union contracts. Four broad categories emerged from the analysis: Organizational Values, Organizational Considerations, Regulations, and Resources.
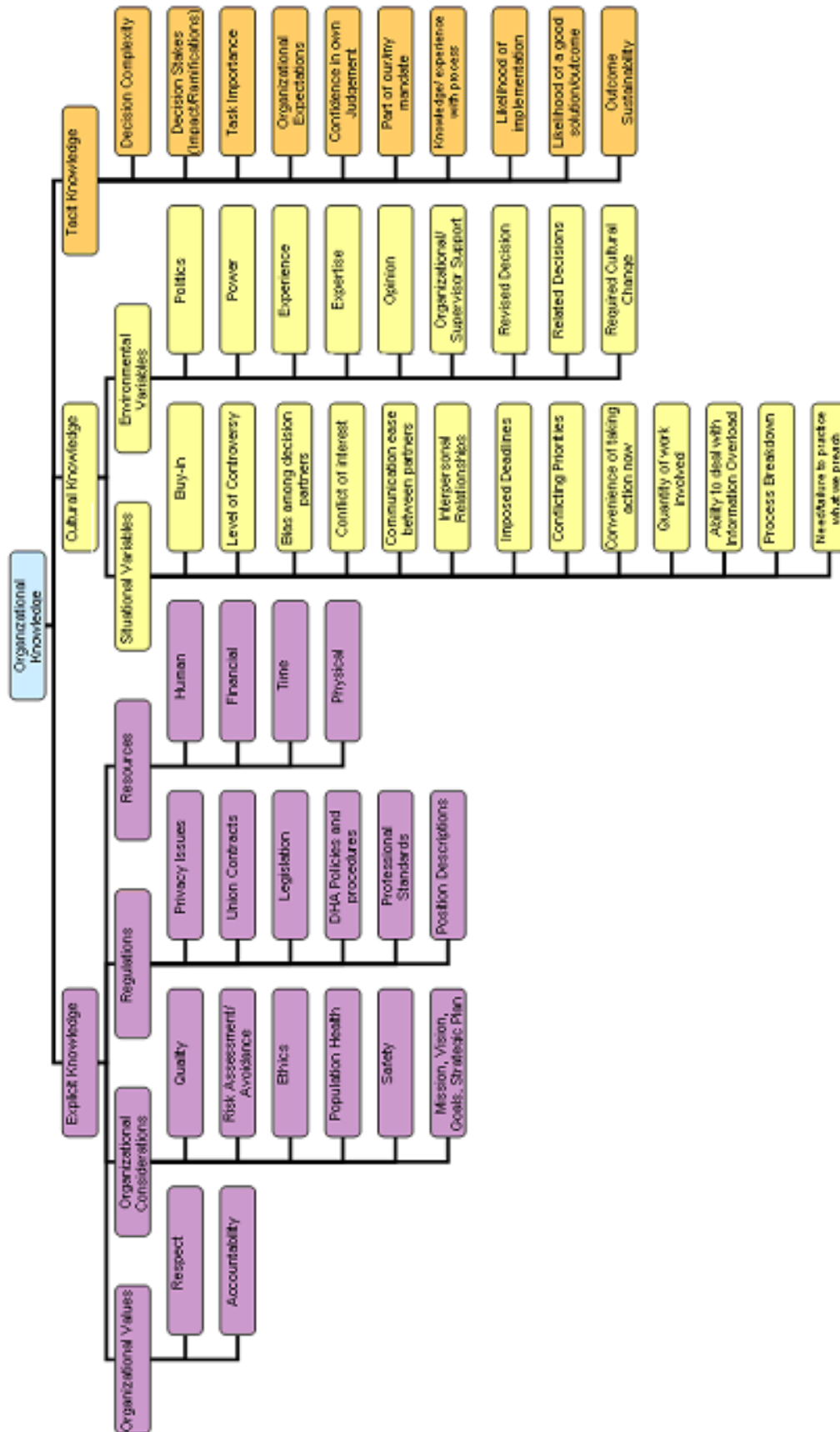
Figure 4-4 Information that Influenced Critical Incident Decisions

Organizational Values

Participants drew on formal organizational values such as respect, trust, equity, and accountability as internal information 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. (Participant Group 1-A)*

> *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. (Participant Group 2-A)*

These descriptions are similar to Davies' colloquial evidence category for values and decision-making context (2007, p.5).

Organizational Considerations

Other explicit knowledge mentioned by participants appears in the organization's mission, vision, and strategic directions; others are represented by committees or positions within the organization that serve as information gatekeepers and 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. (Participant Group 1-A)*

> *I would look at ethics principles … those would be the principles that I would go down through -and talk about with people around. (Participant Group 2-A)*

Participants were asked whether they considered the organization's mission, vision and strategic plan. Some of those who did used these as a guide or tool.

> *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. (Participant Group 2-C)*

> *What we have done is taken each of the districts' mission and strategic directions and look at [our service] priorities and where they fit together and we have drafted the operational plan for [our service] based on the strategic directions of the districts. (Participant Group 3-C)*

> *Yes, I do actually. I do … And so when we make decisions we certainly look back at the mission, vision and values and how those align with the mission and values of AVH. (Participant Group 1-A).*

Organizational considerations, which influenced participants' decisions, may fit within several of Davies' (2007) categories for context-sensitive scientific evidence (Lomas *et al.* 2005).

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. Legislation, standards and other guidelines influenced participants, as suggested by the following two quotations.

> *Yes, generally if we are looking at a project … we will look at what the regulatory bodies say first … and start building from there. (Participant Group 3-D)*

> *… we always look back at the standards of practice. (Participant Group 1-A)*

This is congruent with Head (1996) and Niedźwiedzka (2003a) who observed the importance of legal information, guidelines, policies, and similar regulations to health service managers in their decisions.

Resources

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:

> *We had to use internal information, and that was number of staff, where are their positions' workload? (Participant Group 3-C)*

> *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. (Participant Group 2-D)*

> *…then factor in the other pieces like people, time, money and all the rest of it to see whether that will support it. (Participant Group 2-D)*

> *Problems are human resources and require the least information other than the particulars around a case, or the limitations of a collective agreement, or the human resource policies around those. (Participant Group 4-B)*

These health service managers were similar to those in the UK (Head, 1996) in that they had difficulty accessing service and performance statistics so they could match productivity against available resources.

Cultural Organizational Knowledge

Health managers' decisions were also influenced by cultural organizational knowledge as background information. The literature review was initially unable to suggest the best way to sort cultural knowledge. During data analysis, knowledge and information that influenced decisions initially indexed as cultural knowledge were re-examined and then sorted into two broad groups – factors that likely affected just the immediate decision and factors that were likely to influence other decisions made over the same period.   After the sorting completed, the two groups were labelled "situational variables" and "environmental variables". 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.

A subsequent search of the literature for similar concepts found the two terms "situational variables" and "environmental variables" used in a number of different fields. For example, they share a single common definition "external influences on behaviour" in the psychosocial literature (American Psychological Association, 2011). Only two articles were identified where both terms were used in relation to each other, of which only one was an information behaviour study. Mick *et al.* (1980) identified several levels of variables affecting managers' information behaviour and labelled them as individual variables, situational (task) level variables, and environmental level variables.

Situational Variables

Situational variables were buy-in, level of controversy, conflict of interest, bias, and lack of bias. The following two quotations from participants 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. (Participant Group 3-C)*

> *The other thing is how controversial the issue is and who is involved with it -who is going to challenge me on it? (Participant Group 3-B)*

Environmental Variables

Environmental variables were internal or external. Politics and power were identified as influences on decision-making. Participants described the need to understand how their decision situations related to the rest of the organization. Some participants realized that their decisions would 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. (Participant Group 3-C)*

> *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 … (Participant Group 3-C)*

Any one of these powerful cultural variables might 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.

Tacit Organizational Knowledge

Health Managers' decisions were also influenced by tacit organizational knowledge that involved skills and understanding developed from professional training and experience. These were sorted into several categories, including awareness of decision complexity, decision stakes, task

importance and participants' confidence in their own judgment. These had more in common with Polanyi (1966) and informed guesses, hunches and intuition than with Caccia-Bava *et al.* (*2006*) who considered tacit knowledge with respect to health service managers' use of information technology within a framework of absorptive capacity. Participants drew on tacit knowledge to determine decision importance:

> *I would look and say how important is this decision and what impact will it have one way or another on what happens. (Participant Group 3-C)*

> *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. (Participant Group 2-D)*

One participant commented on differences between health service managers and managers in other areas, noting the need beyond information to use moral and ethical judgment.

> *I have always found that the people in the health business, you call it a business, but a lot of it is moral, ethical judgment and that kind of thing -it is more than a business, it is a business to a certain extent and you do have to run it like a business to certain extent, but it isn't a total business. (Participant Group 3-C)*

Some managers' descriptions of information they used to inform their decision suggests that intuition played a role in informing some decisions:

> *I just had to go with my gut and say "let's give it a try". (Participant Group 2-D)*

> *It was just a thought I had, just a plan and I didn't know if it would actually work, and being new in management to do a gutsy move like this and not have a whole lot of data behind it supporting the decision in terms of evidence and literature to support it, it felt a little bit risky to me but I also knew it was a decision that had to be made otherwise I was going to lose the [professional staff] that I had. (Participant Group 2-D)*

The following comment from one participant suggested both the complexity of these critical incident decisions, as well as the complexity of information types used to inform them. This quote perhaps also reflected the participant's awareness that the researcher, as manager of library services, expected to hear that written research-based information from journal articles informed the critical incident decision just discussed instead of oral information from different internal sources.

> *The vast majority of decisions that one gets involved in are really not informational types of decisions… The general ones have elements operational and procedural -and have overtones of financial and strategic -closing laundry at [one health centre] and moving the laundry to [another larger health centre]. What is the socioeconomic impact? -even though that is not our mandate. How do we make life easier for the people involved? How do we communicate that to the Board? What is the business case around those sorts of things? And what are the operational things that we have to take into account? (Participant Group 4-B)*

Each of these health service managers informed their critical incident decision with a mix of explicit, tacit and cultural information. Fifty different types of shared information were identified

(Figure 4-3).   These findings are congruent with Kovner (2005) who observed *"All management decisions are based on evidence"* (p. 21). Kovner's complete sentence reads "All management decisions are based on evidence but many are not based on what an effective manager might say is reasonably good evidence" (p. 21). Whether health service managers and academics working in health services areas share the same view as to what represents "reasonably good evidence" is not clear. The next part of this section re-examines the information these participants did use and points out different routes by which research information reached these health service managers to inform their decisions.

Research Information Used

The role of research information in these cases is not as clear as it might have been if participants were asked directly whether and when they used research information in their critical incident decision. It was not until data were examined from the perspective of information used that the researcher realized that there were no cases where it was obvious that new research based information contributed to critical incident decisions. Had the researcher noticed this when conducting interviews, she might have purposively changed the emphasis of her interviewing to focus on critical incident decisions relating to research based information. The researcher went back through previous themes and re-examined descriptions of searching databases or the internet or using librarians as intermediaries to search for information from published research. No participant specifically described identifying a need for new research to inform a decision, and then purposefully searching for new research based information and then basing a decision or changing a decision on that information. One participant described informing her critical incident decision with information from a book.

> *I always do things on the run so, it just sort of happened that I had it …a book that I just got that had come through -I had ordered it so I had it, so it just happened, because really what the focus of this whole group needs to be about -addressing the whole professional practice, supporting professional practice issues … (Participant Group 3-A)*

Participants who described using intermediaries to search for written information to support their critical incident included research in descriptions of their expectations about the kinds of information that would be synthesized for them.

> *They were supposed to look to best practice, current practices, current structures and current practices in the province and they were to do interviews with people in the province and go to the literature, whatever avenues they had, talk to current stakeholders across the province and they were to talk to current stakeholders and they were to compile an inventory of what was happening now and make recommendations around the various ways that you could actually address the issue, and pros and cons for each one, and provide that to us as a discussion document for us as steering committees to go out and seek input from our own respective teams. (Participant Group 4-B)*

> *Now I am not sure what is out there myself, but she would have gone through that and done the literature review to look and see what is there… It was part of her task as research to look at that kind of thing and certainly … am jumping the gun here because she is making a*

> *presentation to us next week, but yes, that was part of what she was asked to do, to see what is out there.(Participant Group 3-C)*

In responses to exploratory questions, some participants noted the value of filtering academic research based evidence through practical expertise.

> *If I come up with a question that I don't know the answer to, the first thing I am going to do is access a specialist in the field … I might do a little bit of a search but if I can get an answer in like two seconds that is where I go first …they say to me you know "Check New England Journal of Medicine -I am not quite sure but I know something came out on it" -or "We never ever do this in practice, don't be fooled". (Participant Group 2-D)*

> *Most of us have had very good experience personally with the system so are not as quick to say "no, the research says we shouldn't do this, therefore we shouldn't do this" -no, we have question marks about what is going on with the research because that is not our experience, so we are reading around that area.   (Participant Group 2-A)*

These two quotes are congruent with comments by Davies (2006) who suggested that although researchers who contribute to the evidence based management work are well trained and conduct good research, the subjects they choose are not those managers want, or if they are what the managers are interested in the research points out the problem without suggesting a solution. As the manager of library services, the researcher was aware that many of these participants were regular users of literature search and document delivery services so they did specifically ask for information to inform at least some of their decisions. The following two quotations are examples of information gathered to inform critical incidents through seeking out conferences directly related to the subject.

> *We sent people to the conference in Quebec on [critical incident subject] and said bring back whatever you can -talk to whoever you can about how [critical incident subject] is working in a regional system -what are some of the experiences. (Participant Group 3-C)*

> *It was actually a presentation at a workshop in a conference that I went to that was most useful (Participant Group 3-B)*

Although participants did not explicitly report using research-based information, it was clear that this was happening indirectly. Participants did mention using explicit information such as professional standards, legislation, and policies that would have been developed from research and other sources. They also mentioned considering quality, safety, ethics and population health, each of which is associated with a body of literature with set principles and practices that the researcher was familiar with and knew was developed from research. It appeared from participants' descriptions that they acquired most of the information that influenced their decisions orally, from colleagues, including explicit information that might also have been readily available to them as written documents. They consulted with co-workers within the system and colleagues in other organizations and government experts.

Use of these types and sources of information to inform decisions suggests that these health service managers' were influenced by health research that was shared with them. Sources of

shared information are discussed further in 4.5.2, the Information and Sharing Theme. The value of health research to health service managers was noted as an area for possible exploration in a Second Interview Study.

Information Quantity - Making Decisions without All of the Information

Passages initially indexed as gaps were examined, and classified in more detail as Information Gaps, Information Management Gaps, Skills and Capacity Gaps and Resource Gaps. Within Resources, critical decisions were influenced by budget gaps, equipment and physical space gaps, gaps in human resources and gaps in time available, as shown in Figure 4-5. Further analysis was done only on passages where participants described an "information gap" during the decision process.
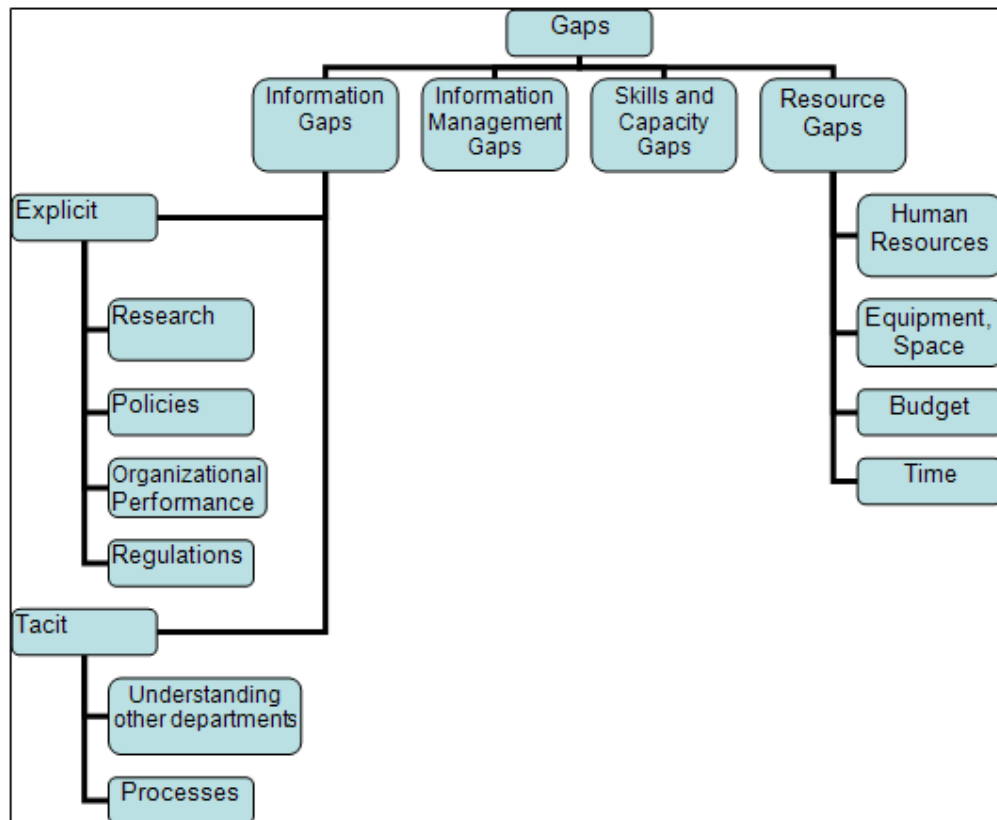
Figure 4-5 Categorical Diagram for Gaps

All participants' mentioned information that they would have liked to have had to inform their critical incident decision but were not able to access. This section discusses gaps in explicit and tacit information organized as shown in Figure 4-5. No participant mentioned gaps in cultural information. Gaps in explicit information already discussed in the Information and Decisions theme include workload performance data and lack of policies and procedures.

Gaps in internal written explicit information may have reflected different types of skills gaps. These may have included the ability to gather information or to generate reports from systems data and then present it in a usable way, as well as gaps in ability to understand the information they did have, as suggested by the following quote.

> *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. (Participant Group 3-C)*

Gaps in tacit information included understanding how other departments work, as suggested by the following quotation.

> *… people have very little notion of how what they do impacts on other areas. (Participant Group 4-B)*

The researcher also noticed that participants were not always clear about the names of other departments and what their services and responsibilities might be. In the following two quotations, participants showed confusion about the researcher's own department and services. The first referred to a service the Library offered, but calling the department by the wrong name; the second referred to a printing service handled by a different department.

> *my very first step was programs in other hospitals which I got through Information Services, the librarian … I have asked for a lot of documentation through Information Services … if I wasn't getting it fast enough from information services, which is rarely an issue… (Participant Group 1-B)*
>
> *I will say for some of the things I worked on where I needed information when I did contact I found the library services extremely helpful… I think that they are pretty strapped for resources. I think that times you ask for help, you can't necessarily get it where you want it, you can get it but it is going to be two weeks down the road. (Participant Group 3-D)*

Participants described gaps in information management systems and infrastructure and the impact these had in understanding performance and workload management in their departments. They also mentioned gaps in finding out what other Canadian health services serving rural areas have done. This discussion has been included in the section on appraising information in the information and Sharing theme. The next part of this section explores information gaps from two perspectives: whether the participants' behaviour as described by one of the theories of "enough Information" might be the reason for the gap, or whether the gap resulted from an inappropriate quantity of information.

Theories of Enough Information

This part of the section examines comments about information gaps for congruence with four theories, one where information gaps are bridged and three theories of enough information where they are not (MacDonald *et al. 2*010).

In Dervin's sense-making theory, a bridge metaphor explains how an individual encounters an information gap between his/her understanding and experience, and needs information to make sense of their situation and then move on (Dervin, 1992, p.68). The individual does not move on without the information. In considering the information participants used to inform their decisions as a whole, Dervin's sense-making theory likely applied. Gaps were identified and bridged by the participant, or by the participants' group of partners making the critical incident decision. However, not all participants' identified information needs were met. Participants informed their decisions with different categories and types of information. Most participants identified gaps that they did not bridge, so Dervin's sense-making theory does not adequately describe what happened in these cases. Further, information seeking appeared to be less a linear process, and the number of sources integrated to inform decisions more complex than might be represented by Dervin's model. Participants' typical approaches to information seeking to bridge gaps is discussed below in the Characteristics of Seekers subtheme.

Next, participants' comments were compared with three theories of enough information beginning with Zipf's Law of Least Effort (Poole, 1985). Participants did not describe making choices between low quality, easily accessible information and high quality and more difficult to use and less accessible information. No participant made comments that suggested situations described by Zipf's Law - where wanted information existed but would have required more effort to access. The scarce resource in these cases appeared to be time, as discussed above

The relevance and applicability of Mooers' Law (Mooers and Mooers, 1996) was less clear. There were no adequate information systems, cumbersome or not, to help them retrieve the information they wanted.

> *For all of the areas in the portfolio we get al. most 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. (Participant Group 4-B)*

> *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. (Participant Group 2-D)*

As discussed below in Section 4.5.3, participants noted that supervisors' interest in a decision situation and the information gathered to inform a decision influenced their perception of task importance and their level of effort in information searching. However, no direct comments about critical incidents suggested that either the organization or participants' supervisors encouraged them or discouraged them from seeking additional information. There were comments on frequently imposed short deadlines that did not allow time for information seeking, but there was nothing to suggest these deadlines were purposefully imposed to discourage use of new information. Kovner's study (2005) indicated that was similar in that his participants placed a high value on evidence based health services management but managers' use of evidence was

limited by *"time pressures, competing priorities, difficulty in obtaining relevant evidence and in translating evidence so that it can be easily used and adapted"* (p. 26). Meeting imposed deadlines requires that these managers work speedily; speed is one characteristic of a dynamic environment (Laufer *et al. 2*008).

Interview responses were considered with respect to Simon's satisficing theory (Simon, 1956). In congruence with Zach's arts administrators (2002), most participants said that if they were comfortable with the information they found, they would make their decision although they might not have had all the information they would have liked.

> *I said I didn't find all the information that I needed. I still don't have other policies and procedures that I wish that I had ...and I probably didn't access all the resources that I could have accessed simply because of the timeframe … I would say … not 100% satisfied …I think I did an ok job. (Participant Group 2-D)*

> *I generally stop [looking for information] unless it raised a question for me, or it doesn't register right -if it appears reliable and true to me -because I would generally have a knack or some knowledge base…I know that I need enough information to give me a good understanding about whatever I am trying to research or make a decision about. (Participant Group 3-D)*

Participants noted that they preferred to make a good enough decision in time to make a difference, rather than make a perfect decision too late:

> *There is also a time sensitivity to this so the other maxim is a decision on time is better than the right answer too late. All these things inform the extent to which one can get the perfect answer all tied up in a nice bow before it [the information/decision/answer] isn't useful. (Participant Group 4-B).*

March (1994) described satisficing decision-makers as active in the face of adversity, changing the decision problem if a good enough solution is not available to address the original situation. Kovner (2005) found that managers facing time pressures made decisions with only 40% of the information they would like to have had, changing the decision if the solution did not work. Participants in this study described similar decision situations where the decision itself changed during the decision-making process:

> *So some of the information I got, some of it I didn't….I don't know how others are dealing with it. …but I got the minimum that I thought that I needed to make the decision -because the decision right now is … a much easier decision on our part. (Participant Group 3-B)*

All participants engaged in satisficing to some degree, settling for the best decision they could make under the circumstances, rather than continuing to search for information, identifying and evaluating alternatives until they were certain they made the best possible decision.

In all cases, it appeared that satisficing was carried out as Simon originally suggested, i.e. within the context of good administration, making the decision that best balanced administrative objectives with least expenditure, or "good satisficing" (Bawden and Robinson, 2009). It

appeared that Simon's Satisficing theory provided a more likely explanation for participants' failure to continue searching for information to bridge all their information gaps than either Mooers' Law or Zipf's Law.

This discussion about bridging gaps explored only what participants described they did in their critical decision situations. There is additional discussion about bridging gaps in the Information and Seeking theme. The next part of this section considers whether and how inappropriate information quantity was a factor in participants' decision to satisfice.

Theories and Definitions Related to Information Quantity

Information responses that mentioned an information gap were explored again to determine why participants did not bridge these and whether inappropriate information quantity was a factor. Situations where participants described being challenged by inappropriate information quantity were examined to determine whether they could be described as information poverty or information overload. Presentation of results begins by considering cases where participants did not have enough information.

Information Poverty

Information Poverty was explored using two separate definitions from research by Chatman (1996) and Britz (2007), listed in Table 4-7.

	Chatman's Theory of Information Poverty	Britz' Main Variables of Information Poverty
1.	✓ The information poor believe they are devoid of any sources that might help them;	✓ Related to the inaccessibility of quality, relevant and suitable information;
2.	✓ Information poverty is partially associated with class distinction ...influenced by outsiders who withhold privileged access to information;	✓ Co-determined by the absence of a well-developed, well maintained and user-friendly information infra structure ;
3.	X Determined by self-protective behaviors that are used in response to social norms;	✓ Closely linked to the level of education and literacy, particularly information literacy;
4.	X Secrecy and self-deception are self-protecting;	X Determined by the attitude/approach towards information and the use thereof as well as the understanding of the value that can be attributed to it;
5.	X A decision to risk exposure about true problems is often not taken due to a perception that negative consequences outweigh benefits;	*A global phenomenon, but can also occur within the same community and context;*
6.	✓ New knowledge will be selectively introduced into the information world ...influenced by its relevance to everyday problems and concerns & usefulness to a current situation.	✓ Related to a lack of material and other means to access information;
7.		*Not only an economic occurrence, but has an important bearing on the cultural, political and social spheres of society.*

**Table 4-7 Two definitions for Information Poverty
with components that describe these participants' comments checked.
(Two components in lighter font were excluded from discussion).**

Chatman's Theory of Information Poverty was considered first. Participant comments supported the first two of Chatman's propositions, namely that many participants did not expect to be able to find the information they needed - they believed it did not exist.

> *For all of the areas in the portfolio we get almost no information from a data perspective (Participant Group 4-B)*
> *... I can never get the level of detail I need. (Participant Group 1-B)*

Others expected the information they needed was available but that they would have difficulty getting it from those who had it:

> *I ask for [data] on a quarterly basis and they always forget to send it to me. (Participant Group 1-Administration, B)*

They keep a lot of information - to get it from them may not be that easy ... (Participant Group 2-D) No responses supported the next three of Chatman's propositions related to hoarding of, rather than sharing of, information. Many positive comments suggested that participants relied on information sharing as a way to get good information. This may be due to the prevailing organizational climate. Information is shared openly and actively in more highly functioning organizations but is regarded as a personal resource and hoarded in organizations that are less highly functioning (Westrum, 2004). Participants may also have demonstrated social desirability bias (Edwards, 1957) in advocating information sharing behaviours.

There was some support for Chatman's proposition 6 with respect to introducing new knowledge as required to meet immediate needs with the suggestion that the value of information was considered before seeking it. Quotes and discussion associated with proposition 6 and information value have been discussed below in the *Approach to Seeking* subtheme of the *Information and Seeking theme*.

Participants identified an array of factors, all related to the outcome and its significance or benefit, as the most important drivers that determined their level of effort in information seeking. Managers, particularly those at lower levels, indicated they were expected to gather information and maintain awareness of subjects related to their service and to their position. Participants at all levels mentioned that they tried to stay up-to- date in their fields but did not always have the time. These issues are discussed in more detail with respect to credibility and positional information gatekeepers in the Information and Sharing theme.

Responses were next examined with respect to five of the seven information poverty variables identified by Britz (2007) adapted and numbered as shown in Table 4-7. Two of these, numbered five and seven in the table related to information poverty in broad contexts difficult to relate to these participants' critical incidents so these were excluded from this discussion. The first two variables, similar to Chatman's propositions 1 and 2, described study participants'

situations. These reflect the expectation that information needed would not be available, and that the information available was not always credible.

> *Trying to find something that is specific, that really relates to the situation ...is very difficult ... (Participant Group 3-B)*

> *I don't always feel that our data is reliable and valid ... (Participant Group 1-B)*

Congruent with observations by Bowen *et al.* (2009), about the current lack of systems and resources for tracking, organizing and retrieving data in health services, several comments illustrated the lack of information management infrastructure in the organization:

> *We don't have a good reporting framework for the indicators ... in my portfolio (Participant Group 4-B)*

> *The lack of a [participant's department] information system... I can't tell you [figures for] workload management, case management, program activity and output. (Participant Group 3-C)*

Although most study participants had both professional degrees and graduate degrees and so had higher levels of literacy skills than the general population, some participants indicated their own level of information literacy was not as high as it might be and some mentioned a need for better data analytic and evaluation skills within the organization:

> *I often think my level of computer skill in figuring out how to find information is the biggest barrier (Participant Group 2-A)*

> *We don't have ... much information and are not 100% sure of what it means. (Participant Group 3-C)*

These comments were congruent with literature suggesting that few Canadian health organizations have staff skilled in interpreting information such as vital and health-related statistics (Bowen *et al. 2*009, Smith, 2005). Similar issues have been identified in US health service managers (Kovner, 2005).

No comments were identified to support the fourth variable; there was no indication that a negative attitude toward information existed within in the organization. In this study, all participants engaged in information seeking to support their decision. Specific references to the many internal and external information sources used to support decisions suggest a positive attitude toward information and an understanding of its value, reflected by the following quotation from one participant.

> *I would never want my thoughts and ideas to go forward without having been well researched and well educated, well put together. (Participant Group 2-D)*

The final variable relates to material means and does describe characteristics of study participants. Participants identified information and information management gaps that would

need additional resources to remedy. These included lack of human resources, a shortage of space, equipment and other physical resources and budget issues. Many participants commented on their need for systems to track services and staff workload, frequently commenting about not having enough time to do all the work they needed to do:

> …one of the things that I don't think we are really good at, giving people enough time to make decisions around certain things. (Manage, D)

This comparison of participants' comments with components of definitions for information poverty suggests that these health service managers were challenged by information poverty. Three of Chatman's six propositions and at least three of the five of Britz' variables considered reflected these participants' situations. Information poverty may contribute to explaining why managers satisfice. Inadequate information management infrastructure is common to both overload and poverty.   Participants need, and look for, internal information to help supply needed context when solving problems and making decisions without an adequate information management infrastructure to support them.

Information Overload

Whether participants were challenged by information overload was considered using a framework developed from a definition compiled by Iastrebova (2006). Components of this definition of information overload have been abbreviated and numbered from one to seven as shown in Table 4-8 to facilitate its use as a framework.

At a glance, the first and the sixth components of this definition appeared similar. Examination of the original source for this part of the definition (Hiltz and Turrof, 1985) revealed that part 1 related to information pushed out to managers; part 6 referred to information pulled, that they requested or searched for themselves.

1.	*X The volume and speed of incoming information is beyond processing capacity;*
2.	*X Decline in user performance;*
3.	*X Failure to achieve a balance between task requirements and processing capacity;*
4.	*X Decrease in task performance with increased information;*
5.	*✓ Time needed to process information exceeds available time;*
6.	*✓ Receipt of more information than is needed or wanted to function effectively;*
7.	*✓ Information processing requirements exceeds available information processing mechanisms.*

Table 4-8 Compiled definition of information overload (Iastrebova, 2006)
abbreviated and numbered for use as a framework in this thesis
with components supported by these participants' comments checked.

Parts 1 and 2 of the definition described difficulties with information processing capacity due to the volume and speed of incoming information, and decreased performance due to information overload. Some participants did mention that they had trouble dealing with information they

requested or searched for themselves but nothing in their responses supports the first two parts of the information overload definition. Participants did not specifically comment on difficulties with information processing capacity due to the volume and speed of incoming unsolicited information pushed out to them nor about diminished performance within the organization due to information overload.

Part 3 of the definition involved failure to balance task requirements and processing capacity (Iastrebova, 2006). Again, this was not supported by participant responses. No participant reported failure to balance task requirements and processing capacity. Instead, those mentioning anything related to this issue appeared to have developed coping mechanisms that drew on their own experience and expertise, as suggested by the following quote:

> If someone gives me a 50-page report, I am not that keen on reading it. In other words if I have a 5 minute tape or series of charts, that is the stuff I will rapidly process. And then I will go and look for data if I need it, if there is an anomaly there ... (Participant Group 2-D)

The fourth part of the definition related to decreased performance with increased information. No comments suggested that too much information affected task performance. Participants did satisfice. If information overload was an issue for these participants, it is possible that they used satisficing as a coping mechanism (Bawden and Robinson, 2009) as may be indicated by the following quote:

> … because of time restraints we do limit information that we gather, and we limit the possibilities in terms of decisions that we make, so to be able to streamline decision-making … (Participant Group 2-C)

The fifth part of the definition related to time needed to process the information exceeding available time, and the sixth part to more information received than wanted or needed to function effectively. Both are supported by comments from participants. The following three quotes are examples of participants' comments suggesting that they did not have enough time to process all of the information they found.

> I was looking for something for [a specific] forum and found, 2000 sites - you can't just go through them -it is mind boggling really because you can't figure out which are good sources, you don't have time. (Participant Group 3-C)

> Can I get through those thirty papers? Oh, my ... I can't do that ... (Participant Group 3-A)

> A problem is that there is just so much information -you know so hopefully a [decision-making] model would help [us] figure out what we might focus on -one of the other problems is just that we are bombarded on information. There is so much information -probably I think as a district we could benefit about learning about decision-making, critically thinking, there is a problem I think that people use their own intuition and don't go beyond that [to] make a decision (Participant Group 2-C)

Participants at higher levels in the organization mentioned using intermediaries to meet specific information needs. All participants asked co-workers and colleagues with experience, expertise

and knowledge of the context to provide information. One participant mentioned asking questions on e-mail list servers and then receiving too many responses to process. Another mentioned receiving requested information in writing and not having time to look at it. Although no participant in this study mentioned receiving too much unsolicited information, recent initiatives in the same District suggest that unsolicited e-mail is indeed an information overload issue, similar to findings by Bowen *et al.* (2009) who reported that managers found e-mail and Blackberry technology intrusive contributors to fractured attention.

Part 7 of Iastrebova's definition relates to information processing requirements exceeding available mechanisms. The lack of workload performance data was mentioned frequently. Many comments referred to the inadequacy of information management systems, especially for tracking services. The lack of an information management infrastructure was seen as a barrier to effective information use:

> *I can't possibly keep track of all of it (Participant Group 3-C)*

> *... the tracking and the follow-up pieces are what was the big challenge for us (Participant Group 3-D)*

Some participants described their situations as "information overload", although only two of seven parts of the composite definition of information overload were supported by participants' comments. It is possible that study participants were also challenged by information overload, although this was less discernible from interview analysis. Recent research suggests that information overload is prevalent in today's workplaces (Accenture Information Management Services, 2007, WorldOne Research, 2008, Farhoomand and Drury, 2002). One review (Hall and Walton, 2004) documents research and descriptions of information overload in health services organizations. Health services in Nova Scotia have completely restructured with downsizing twice within the last fifteen years (Canadian Institute for Health Information, 2005b). Health services restructuring and downsizing has been identified as one cause of information overload in health organizations (Wilson, 2001). It would thus be remarkable if in 2010 these health service managers did not experience information overload.

Section Conclusion

Participants' comments about the information they would like to have had were indexed as information gaps and examined with respect to four theories and three definitions. Of the four theories related to information behaviour when faced with an information gap, Simon's Satisficing Theory appeared to describe their situations best. Dervin's Sense-making, Zipf's Law and Mooers' Law did not appear to reflect these participants behaviour with respect to information gaps.

Comparisons of participants' comments with definitions for information poverty and information overload were not conclusive. Participants' comments suggest that health managers learn to cope with information poverty, and perhaps also with information overload through expertise-related information sharing. Further research would be needed to determine which of the two phenomena, information overload or information poverty, presents the greater challenge to this group of health service managers and whether both challenges can co-exist for the same decision situation.

It would also be of interest to determine whether health service managers have developed satisficing or other coping mechanisms that enable them to deal more successfully with information overload than with information poverty, or whether satisficing is an information behaviour that would be practiced regardless of information quantity.

Finally, these participants were relatively homogenous with respect to educational background and career years. Further research is needed to determine whether newcomers to an organization would be more likely to experience greater challenges when faced with inappropriate information quantity than insiders or experienced workers, or whether career managers would have similar perceptions and experiences related to inappropriate information quantity than hybrid managers.

Summary of Information and Decisions Theme findings

There has been too few information behaviour studies conducted of health service managers to allow these study findings to be generalized to research specifically on health service managers. However, the findings presented related to participants' workplace decision situations and managers' decisional roles were easily categorized within frameworks developed from research on managers in general. The findings from this theme suggest that information behaviour studies of managers' in general may be useful to support design or development of library services for health service managers.

Decisions were not informed by just one item of information gathered at the beginning of the decision process. The findings presented on information-related actions within decision phases suggest that information is wanted and needed at different points within the decision process. This particular analysis suggests that information may accumulate as it is gathered, and that as it accumulates it influences the nature of subsequent information needs. Additional specific research is needed to determine if this is typical in group decision-making. Enough information was gathered to suggest that knowledge brokers, or others who may wish to provide health service managers with information to support decisions, may need to engage with decision-makers throughout the decision process. Further research is needed to determine whether there

is a typical sequence of information need within decision phases that might be anticipated by information providers.

The findings on the different types of explicit, cultural and tacit information that inform decisions may also be of interest to those who support health service managers' decision-making with information products and services. The researcher initially expected to be able to organize the information shared to inform decisions by type of container (journal articles, meeting minutes) but content appeared more important than its container. Much information was shared orally, placed in context by decision partners or other interpersonal sources approached for information.

Further analysis of comments that suggest how new research based information enters the organization has been included in the Information and Sharing and Information and Seeking themes below. The Information and Decisions theme also explored participants' behaviour when they could not access information they wanted to support a decision. Information gaps were explored to determine whether they were caused by participants' information behaviour, lack of information management infrastructure or inappropriate information quantity. These findings suggest that participants satisfice to balance need with administrative cost and make the best decisions they can in time to make a difference. More research is needed to determine which of the two, information poverty or information overload, presents the larger challenge; regardless, or whether resolving information management inadequacies characteristic of both may decrease information gaps.

Information and Decisions theme findings suggest that participants work in a dynamic environment, in which they were challenged by complexity, uncertainty and speed as characterized by Laufer *et al.* (2008). Understanding how oral information sharing informs group decision-making may contribute to our understanding of these health service managers' work habits and situations. The next subsection explores information sharing which appeared to be the dominant information behaviour identified in the Information and Decisions theme.

4.5.2 Information and Sharing Theme

The Information and Decisions theme included many examples of participants approaching other people about their critical incident decision. In some cases, individuals were consulted separately; in others, a group came together to discuss an issue. Such interview passages, in which information appeared to flow between people as they discussed the situation, contributed individual perspectives and built on each other's knowledge, were indexed as "information sharing".

Information Sharing was not a focus of enquiry considered when the research proposal was drafted, when research questions were developed or when the initial literature review was completed. At the beginning of this research, two definitions served as a starting point for

understanding information behaviours. The first was Case's definition for the range of activities known as information behaviour (Case, 2002): "encountering, needing, finding, choosing and using information" (p. 4). The second was Wilson's definition of information behaviour, with attention to research literature on needs, searching and using, and little attention to transferring.

> *By information behaviour is meant those activities a person may engage in when identifying his or her own needs for information, searching for such information in any way, and using or transferring that information.(Wilson, 1999)*

During analysis, when information sharing emerged as the dominant information behaviour in critical incident situations, an exhaustive review of research related to information sharing was completed (Section 2.5). Of definitions for information sharing identified through the literature review, two that did not specifically incorporate information seeking seemed more appropriate to groups of managers (Bao and Bouthillier, 2007; Clarke, 1973). Participants' information sharing activities were considered with respect to these two definitions, listed in Table 2-1.

Bao and Bouthillier, 2007, p.1	Clarke, 1973, p (p. 552).
✓ collaboration	✓ communication mode is usually interpersonal
X between two groups of actors	✓ within social systems where members have direct contact with one another
✓ in order to exchange information	X verbal and nonverbal information
✓ purpose to achieve their individual or common interests	✓ likely to be exchanged rather than simply sought
	✓ technically possible to exchange
	✓ information is more equally distributed among parties
	X the parties have a continued interest in relating to each other

Table 4-9 Two definitions for information sharing with components supported by these participants' comments checked.

The more recent definition involved collaboration or working together and reflected these participants' actions. This definition referred specifically to information exchange between two groups to achieve individual or common interests. Participants in this First Interview Study described information sharing, but with respect to critical incidents, that did not always involve information exchange. The groups that came together were then a single group with a common purpose rather than two groups with common interests. Although these differences are subtle, the definition proposed by Bao and Bouthillier (2007) appears to only partly reflects the information sharing behaviour as described by these participants.

The second definition (Clarke, 1973) differentiated information seeking from information sharing and included several elements or dimensions for considering information sharing. These First Interview Study participants' chosen mode of communication tended to be interpersonal, face-to-face. Although there were no specific references to nonverbal communication (i.e. body language), participants described exchanging information verbally, including explicit information that would also have been available to them in written form. Information shared in meetings was

shared equally among those present. Although no participant specifically mentioned an intention to continue to share information with those who were consulted or who participated in meetings about their critical incident, the nature of the health service organization would suggest that participants who work in the same organization would have a continued interest in relating to each other. Clarke's definition (1973) seemed to capture information sharing more completely, as described by these health service managers than the more recent definition (Bao and Bouthillier, 2007)

The remaining two themes explore these health service managers' information sharing and information seeking behaviours as defined by Clarke (1973).   The Information and Sharing theme considers the information shared, the sharers' motivation to share, the origins of information shared and methods of sharing. It also considers whether or how givers and receivers assess relevance, value and credibility of information shared orally and whether there are differences between career managers and hybrid managers with respect to appraising information.

Motivation to Share

Comments where participants described giving information were examined to see if their motivation might be detected. Both career and hybrid managers described sharing information related to their critical incident as part of their managers' decisional role (Mintzberg, 1973) and these roles provided motivation to share information. Although managers' roles do include acting as liaison between the department and other groups (Mintzberg, 1973), there were no comments that suggested participants who were hybrid managers acted as liaison specifically between managers and clinicians, a role suggested by Detmer (2000).

Aside from managerial role, participants' current and previous positions appeared to be the dominant factor behind being approached to share information. Some hybrid managers who described being asked for advice related to their professional training or experience might be described as information gatekeepers (Allen, 1996). The following quotation is an example of a hybrid manager who continued to function in an information gatekeeper role tied to a previous position, providing information from knowledge and expertise associated with that previous role even though it fell outside the responsibilities required of the current position as a manager.

> *I was asked to help someone with a position description -and the position was to include responsibilities in an area that the person did not have much experience with. It included community development, the use of a population health approach in decision-making vs. a traditional facility management role. So I was asked to think of some of the skills that would be important in this newly defined role. (Participant Group 2-C)*

As noted in discussion of action during the first decision phase, when participants described bringing people together to discuss their critical incident decision, they described their chosen

decision partners by position titles. No participant commented on how they chose their interpersonal information sources. It is likely that they chose those they believed would have relevant information to share as well, including those in positions directly related to the situation.

The following two quotations from participants at the Junior Leader level made in response to exploratory questions suggest a high level of information seeking and gathering activity.

> …at any given time there are probably 50 different things that I am looking for and that I am gathering information for. (Participant Group 1-A)

> In the beginning of my job, I didn't know that I could access [library services], so I was doing it myself], because in my masters I was used to just going and getting everything, and then my boss told me …I should send my things to [two named library staff] so I didn't spend a lot of time. Sometimes I look into Google and try to find a certain web site, but I don't spend a great deal of time … (Participant Group 1-Administration].

Whether these Junior Leaders were information intermediaries or information gatekeepers was not clear to the researcher. The question prompted the researcher to review MSOutlook staff lists by department.   Positions with similar responsibility levels with position titles such as "Assistant Manager", "Analyst", "Educator", "Coordinator", "Planner" or "Officer" were identified. Some of these positions were members of leadership while others were members of bargaining units. Some supported staff, such as injury prevention, employee wellness, risk management, disaster planning, decision support, and ethics. Others supported patient service planning and delivery such as chronic disease prevention, patient navigator, cardiovascular rehabilitation, early childhood health, health promotion, and community health planning. A question about the role of staff in junior leader positions with respect to information seeking and information sharing was noted for further exploration.

There were no comments from participants about their information giving that suggested they might be characterized as opinion leaders (Lu, 2007), boundary spanners (Detmer, 2000; Daft, 1989), knowledge sellers or knowledge brokers (Davenport and Prusak, 2000).

Whether information sharing was motivated by reciprocity (MacKenzie, 2005) was explored with respect to information shared with co-workers within the organization and with colleagues outside the organization. No comments suggested participants were motivated to share information internally in anticipation of getting information they needed in return. Each participant in this First Interview Study had a unique and specific position title. No participant had counterparts within the organization with whom they shared the exact same responsibilities with whom they could expect to exchange information related to routine work on a day-to-day basis. Reciprocity may be a more likely explanation for participants' willingness to give information they created to counterparts in other organizations, as suggested by the following comment.

> *We can just go online into the listserv and say "has anybody developed a competency on cad pumps", or whatever. And that is happening daily "Had anyone done one on conscious sedation?" Well, we had just developed one, Critical Care did, on conscious sedation, so off we sent that to the other districts, the sharing is wonderful. (Participant Group 1-A)*

Research suggests that position role, organizational benefit, recognition and reciprocity are common factors that motivate managers to share information (Andriessen, 2006). Some participants mentioned the importance of sharing information with provincial government departments in a way that was ultimately for the benefit of the organization rather than the government department, as suggested by the following two quotations:

> *I discovered we had to have approval from the Department of Health in order to go ahead with this because they like to be aware … (Participant Group 3-D)*

> *…because resources are often attached to the quality of your relationship with the Department of Health … (Participant Group 3-C)*

In contrast to the literature describing personal recognition and credit as a leading factor that motivates managers to share information, no participant described sharing information so that they would personally be recognized or credited for it. Furthermore, the findings do not support the suggestion that personal recognition motivated these participants to share information.

Methods of Sharing

The Information and Decisions theme identified examples of participants sharing information orally through both formally scheduled meetings and informal discussion by phone. Participants also described sharing written information electronically through informal e-mail messages and by placing it on shared network drives, as well as more formally by storing it in special databases, as indicated in the following comments, one from a career manager and one from a hybrid manager.

> *Well, the database that the [named external partner] people built out of the business requirements was the bible for us.   That was the most important single thing that we had, 'cause that told us what had to be done, what equipment we had -the orders came from that - the equipment, all of the [specific technical] requirements, bringing the contractors in, everything was generated out of that database. So every piece of information that we had went into that and came out in some kind of process form, in orders or whatever. (Participant Group 2-D)*

> *I could ask someone to send me [a specific type of] report and it comes in electronic format and I could click a button and it goes out to other managers, or I could share it on our shared drive and then everybody sees it. (Participant Group 3-B)*

Some participants indicated decisions and changes should be recorded in writing through more durable and accessible forms such as organizational policies, as indicated in the following quotation:

> *… this change should be put in policy … knowing that another institution had it as a policy now makes me think that "yes, it should be a policy". (Participant Group 2-D)*

Despite many references to information sharing at meetings, no participant commented on the value of meetings. No exploratory questions were designed to probe about meetings and no comments suggested participants used, or relied on, meeting minutes as an information source or as a more enduring method of sharing information that had originally been transmitted orally. Mention of meeting minutes was limited to one comment by a hybrid manager without reference to their use or value:

> I don't remember from the minutes… I see too at those meetings… as really important
> …people having information ahead of time (Participant Group 1-C)

The value of meetings to these health service managers and use of meeting records as an information source is further explored in the Second Interview Study.

Origins of Shared Information

This part of the section explores participants' descriptions of approaching co-workers and colleagues for information to inform their critical incidents. It includes their descriptions of how they generally keep up with information in their fields. Sources of information that these participants shared with their co-workers is discussed further in the Information and Seeking theme.

The following two quotations are rare examples of participants who named sources other than people to inform their decision. The first quote is from a participant who was a hybrid manager and the second from a participant who was a career manager. Both gathered information to meet their specific critical incident need orally. It is interesting to note that in the first example the participant provided the information source to their co-worker.

> I explained to the person, this is what I looked to …my own opinion but it is not that large on the scale -it is just opinion -then I look at outside sources so I spent more time on other outside sources than my own opinion ... the internet, some of the LISTSERV, other colleagues -dialoguing with them chats on a regular basis, local and national newsletters that I look to -what are the trends - and some of our own internal documents, health status report, our community health plans -these are all kinds of decision information that helped me. (Participant Group 2-C)

> … I called other people and asked them "what are you doing?" "is this right, what I am doing, and do I need to do something more?" My very first step was programs in other hospitals. …The librarian … pulled together [some information] before and expert opinion from our own staff within the hospital, WCB, information from other coordinators, OSHA website and then I have asked for a lot of documentation through Information Services (Participant Group 1-B).

Discussion of research information used above in the Information and Decisions theme includes comments listing the information sources participants expected their information intermediaries would use. Otherwise, study participants did not comment on where the people they approached got the information they gave to them. Some who described their efforts to monitor the literature to keep up may have expected their information sources to do the same. When asked an

exploratory question about how they tend to look for information, monitor the literature or search as needed, some participants said they did both, as in the example of the following quotation.

I do look for it when I need it but I also keep up. I subscribe to [journals in my field] or different things related to quality. (Participant Group 1-A)

Two participants, one a hybrid manager and one a career manager, described how they tried to keep up with the literature in their fields.

I try to keep up with information broadly. I do. I get a lot of things coming in to me -for instance the compiled summaries of Weekly Health Edition come across my desk. I never can delete those without scanning to see what the topics are. Things come in from Infoway, I need to look at that. I have had the challenge of having to not read everything. My scanning pile is like this (measures two feet high). Really I try to keep myself [up to date] to know what is going on. (Participant Group 4-B)

I am a firm believer in the keeping up aspect, that if you just tend to look for information when you need it you are probably going to be missing big chunks that will feed into your decision-making, that you are going to miss something. I am a huge believer in continuous education, and continuous learning and my philosophy would be to stay on top of it as I go, if possible. I know I can't stay on top of everything but, you know if possible. (Participant Group 2-D)

One described using an intermediary to keep up:

If I could use an anecdote: I remember having for a couple of years a job with palliative care in a hospital setting and I didn't know anything about palliative care -and started a group service with a nurse and worked a lot with a librarian in the hospital who just began to funnel information to me about bereavement groups -how they worked -and for the two years I just read things the librarian generally found -so when she bumped into something it would come my way -that was a really helpful experience. That collaboration led to a better service. (Participant Group 2-C)

Some commented that they have trouble keeping up with the literature, as suggested by two hybrid managers:

I don't tend to keep up with everything … but I got a new journal [subscription] … I've had it for 9-10 months now and I read that, I read every article in it. (Participant Group 2-A)

I tend to try to keep up to some extent. Although my interest is wide ranging and sometimes is difficult to keep up with. (Participant Group 2-C)

One participant noted that within the organization there were negative perceptions about the value of spending time keeping up with the literature while another noted that searching for information was not an activity that could be managed during the workweek.

[If] I am sitting reading a journal [I would like] not to have someone walk by and say "now you have nothing to do today"… we have that kind of an attitude -it seems to me that we do need to encourage and have people take the time in their work day to be able to read and catch up and it shouldn't be in a frenzy all the time. I think there should be more …acceptance -that it is good to take time to read and generate and learn and take the time to be able to look at information and digest it and analyze it, and I think in our day there should be time to do that … someone should say that it is great that we should sit there and read journal articles.(Participant Group 3-C)

> *I couldn't search at work -I feel that if I have spare time here, not that it is spare time because it is required time to move the organization forward, with best evidence and stuff, but I try to be on hand for the nurses, to support them (Participant Group 1-A).*

It was not clear from participants' comments about keeping up whether they were engaged in this activity to support them in their managers' decisional roles or, for participants who were hybrid managers, they were also trying to keep up in their professional areas. These participants' comments suggest that this group of health service managers do look at the journal literature and are aware of current research, and do make an effort to keep up in their fields. That they use research evidence though professional standards, policies and legislation has already been noted in the Information and Decisions theme above.

Assessing Information for Relevance and Credibility

One of the researcher's assumptions as the District's Manager of Library Services was that before health service managers use information they assess it for relevance, value and credibility. This part of the Chapter explores participants' comments that relate to assessing and appraising information.

Assessing Relevance

The researcher's experience has been that when health service managers place literature search requests unrelated to individual patient care, they typically ask first for research from other Canadian provinces; then, in order of decreasing relevance, from Australia, New Zealand, then the United Kingdom or Scandinavian Europe and the United States. Therefore, an expectation would be that relevance was principally determined by the research being set in 1) a G8 country, and 2) a publicly funded health service. There the few comments that suggested how these participants determine relevance were limited to geography first and health services second.

Participants commented on the difficulty in finding Canadian information in organizations similar to theirs and information on management specific to health settings, suggesting that they consider contextual relevance information in other settings may be less useful to them.

> *There isn't good information across the country around evaluation of how clinicians are doing in their individual practices in [health service area], behind their closed doors. There isn't good information on that. (Participant Group 3-C)*

> *I find Canadian data is particularly hard to find, especially Nova Scotia Canadian data. Particularly the big barriers is that information just isn't out there and if it is, it is in someone's office or in someone's shared drive at work, not necessarily in print in a large circulating journal. (Participant Group 2-D)*

There were varying opinions on relevance of research from places other than rural Nova Scotia. The first three of the following four quotations are examples of participants who would prefer information from their own province. The fourth questions the need for information to be from the same province to be relevant.

I really think it is good to have the information … be Nova Scotian, because rural Ontario is not even the same as rural Nova Scotia. There isn't much Canadian stuff. (Participant Group 3-C)

That there isn't a model that all rural hospitals can take … we don't have a whole lot of information on our Nova Scotia [professional] licensing web site about the use of technicians in expanded roles but the Ontario government has an awful lot of information on their web site about how to use technicians in expanded roles. (Participant Group 2-D)

Trying to find something that is specific, that really relates to the situation -lots of times you can find information that relates to private business …but private business doesn't operate like health and I find it is very difficult to find things that are administratively and management related in healthcare. (Participant Group 3-B)

My experience is that Nova Scotia doesn't like reports from elsewhere -they really have to grow their own it is amazing and I am very frustrated around community health centres for example, community health centres have been in this country since sixties and seventies, proven model -we have been talking about community health centres since the closure of this hospital and we still don't have one. And often we hear in meetings "that was a good report done in Ontario -Nova Scotia is different" and there are some generalizations, some learnings you could take and apply them here -and the other thing that we hear when you look at the demographic and indicators for Nova Scotia it is fairly homogenous -but we have communities saying, no we are totally different.(Participant Group 3-C)

Participants also commented on the scarcity of information specific to health services settings, suggesting that work done outside health settings may not always be applicable.

…Trying to find things that work in the health system [is difficult] … you can find lots of things about private businesses … but private business doesn't operate like health and I find it is very difficult to find [information] about administration and management related to healthcare. (Participant Group 3-B)

These results related to relevance were taken from participants' comments. As has been discussed above, decision-makers' actions when they needed to inform a decision also relate to relevance. It appeared that decision-makers prejudged relevance by approaching only co-workers and contacts that they believed would have relevant information to share with them. They also limited the information that would be shared with them by focusing on a specific subject in a meeting situation. Those invited to the meeting to share information would be unlikely to share information not relevant in that setting.

Assessing Credibility

The Information and Decisions theme included descriptions of decisions influenced by varying amounts and types of information, mostly oral and from multiple sources, shared at various stages in the decision process. The following two quotes are examples of comments from participants who said they believed the information they used to inform their critical incident decision was accurate.

It is accurate but sometimes people don't give enough detail. (Participant Group 1-B)

> *If you want it as a percentage, I would say that I am about 85% confident that the information I have is accurate, except for that piece that I have -conflicting information … (Participant Group 3-B)*

Interviews were explored to determine whether, and how, participants determined the credibility of information that was shared with them orally. The following quotation is an example from one participant of how to go about verifying, and then confirming, oral information received.

> *I would do two things [with verbal information]…One is to attempt to confirm it -this is where Google comes in, and [the other is] to confirm back to the person that "this is what you actually said". That is the two dangers -one is that the information is suspect, you have to verify it -the other is what the person said – "I didn't really say that anyway". (Participant Group 2-D)*

Two participants, the first a career manager and the second a hybrid manager, took different approaches in assessing the information provided to them, as suggested by the following quotations:

> *I don't have a lot of time to spend on frivolous things. And when you put yourself in that situation …you are left to judge rather quickly what is and is not frivolous. And … the primary way that I do that is take into the account the individual from where the information is coming from. If the individual has a mindset like mine that wants information that is dead level relevant to what we are trying to do with none of the hearts and flowers, whereas other folks who don't have quite enough to do with their time give me an over abundance of information… (Participant Group 4-B)*

> *… based on a long history of looking at that literature and a lot of experience at a practical level … (Participant Group 3-B)*

Several participants noted problems with individuals who shared out-of-date and biased information as shown by the following quotations:

> *Some people their information is old. Some people know have their stuff from back in their learning curve of twenty years ago, they learned about something and it is old. And if you run into somebody that hasn't kept up then that is a real concern then your respect for whatever information they are giving you is tainted by the fact that you aren't sure that they really kept up and so that is an issue. (Participant Group 3-C)*

> *But it's because it's if not adversarial, at least there is so much vested interest in the information provided that there has to be some filtration to separate the extent to which the information is true, exaggerated, partially true, complete nonsense or any variation on that theme. (Participant Group 4-B)*

> *There are some people, if they told me something, I would take it with a grain of salt and would question where they got their information. There are other people that I have respect for and know their information …is very reliable. And that whole judgment call as a manager is based on your experience with the people, and …what that person has done, and tends to do… So I have to do a lot of that judgment around, so a lot of it I am not looking up, I am taking it from someone else. So that is a real judgment call, and I do that, and if I am not confident, I go further. (Participant Group 3-C)*

Several participants in more senior positions mentioned that they were frequently asked for information, but were not always comfortable giving it because they were not able to find time to

keep up in their fields. Others chose not to try, as described by the second quotation from one of two participants who identified problems with their own credibility, the first a career manager and the second a hybrid manager.

> *When people ask me about a [specific] health program, where else has that been done and what are the benefits of it ... I can tell you some cursory things, very general nature, but I can't tell you the level of detail that I would like to give. (Participant Group 3-C)*
>
> *Now because I wear three or four hats, I try but I can't keep up ... certainly I don't try to give people information that I am not sure they can't come up with. So that is a decision that I have made, if someone asks me a nutrition question I refer it to someone else. (Participant Group 3-C)*

In the following two cases, the first a career manager and the second a hybrid manager, participants described identifying inaccurate or incomplete information that might put the health service at risk and then confirming their own credibility before taking remedial action:

> *…had some concerns about where he was going with his options. So I started to look at some of other areas … looking at issues that were identified and validated and then talking with some other people that were like minded…we went to the [provincial association] and last Friday sat down together and … pulled in also the School of Nursing at Dalhousie -people who deal with [the subject] (Participant Group 3-C)*
>
> *I shared some of the content … for content expertise … and said "what is your opinion, in terms of this content", and they suggested that they were concerned as well as some of it wasn't appropriate information or correct, so the first step was kind of vetting some of the content, what were other people's opinions of what was there. (Participant Group 2-C)*

Hybrid managers have experiential practical knowledge in how to supervise staff, prepare budgets and run departments according to organizational practices while career managers with degrees in health services administration, business or project management have both theoretical academic knowledge and experience in these areas. Hybrid managers also have a body of professional knowledge and experience directly related to health services that career managers do not.   The difference noted between career and hybrid managers' comments is that hybrid managers tried to keep up in their professional areas, although not all were successful, and drew on that body of professional knowledge to inform decisions and assess credibility. Neither hybrid managers nor career managers described keeping up in subjects related to management or leadership. The frequency of comments related to credibility from all participants, whether hybrid managers or career managers, suggested that accuracy, currency, completeness and relevancy of information was important to these participants.

That the First Interview Study did not determine what health service managers do to bridge information gaps if they suspect information supplied to them by a co-worker is not credible was noted for follow-up exploration in the Second Interview Study.

Summary of Information and Sharing Theme findings

This subsection focused on information that participants described wanting, needing or using to inform their decisions. Most of this information appeared to have been shared orally with them in group situations. Most information was shared orally but some described sharing information in writing, including electronically through e-mail or by adding it to a database or shared drive. Although most participants referred to group information sharing, no participant mentioned using meeting minutes as an information source. The researcher wondered whether, and how, the structure of the organization might contribute to meeting frequency and to creation and use of meeting minutes. Further research is needed to understand the organizational dynamics that encourage and support oral information sharing.

Participants' current or previous positions appeared to be a dominant factor that motivated them to share information. All participants appeared to share information related to their managers' decisional roles. Participants at all levels, except the Senior Executive, described gathering information to meet a specific request. Some who were hybrid managers were also approached to share information related to their professions and among these some hybrid managers who were asked for information that related to previous positions had concerns about their own credibility. There was not enough detail to determine with certainty whether there were differences in information sharing practices between career managers and hybrid managers.

Participants who purposefully kept up in their areas did not say how they managed the information they gathered or how they recalled information when a need to share it arose, whether they used electronic or paper filing systems or relied on their own memories.

Participants with more career years appeared to be more comfortable using their experience to determine what information was credible and what was not. No common criteria to determine credibility were identified. With respect to assessing relevance, responses were mixed with respect to information that was written specifically about rural Nova Scotia health services, and anything else. No explanations about relevance can be suggested from participants' comments, but their actions in choosing certain people as oral information sources suggests that they prejudge relevance by limiting the information that will be shared with them by limiting the sources to those they believe will have relevant information to contribute.

Participants at both the Manager and Director levels described misgivings about their own credibility when asked to share information in areas where they could not keep up to date, and suspicions about the quality of information shared with them if they knew the information giver did not keep up with research in their areas. Their accounts did not include descriptions of what they would do in group situations should inferior information be shared. This question was noted for exploration in the Second Interview Study.

These processes of identifying information needs, then finding and using information to support a decision in these First Interview Study cases took place over varying periods of time with reliance on participants' memories of information needed and used. It would be useful to understand information used to inform group decisions made over shorter periods, perhaps within single meetings.

The next theme, 'Information and Seeking', focuses on characteristics of participants who described actively searching for information from sources other than their colleagues, and characteristics of sources other than oral information sources.

4.5.3 Information and Seeking Theme

This theme presents two sets of findings. *Characteristics of Seekers* examines how participants typically approach information during decisions, whether they identify a need or not, whether they search or not, if they searched, how they approached searching, and whether they searched themselves or asked others. *Characteristics of Sources* examines interview passages indexed as information sources from dimensions related to content (origin, channel, location, credibility, and context/situational relevance), and to format (whether written or oral, whether printed or electronic) and access, including information management.

The findings and discussion presented in the Information and Decisions theme and the Information and Sharing theme came predominantly from critical incident discussion. The findings presented within the Information and Seeking theme came predominantly from exploratory questions designed to probe information behaviour and information source preferences.   Therefore, there is potential to compare participants' accounts of what they actually did, as reported in the two first themes with what they said they would generally do in discussion of the findings presented in this theme. This subsection begins with discussion of participants as information seekers.

Characteristics of Seekers

Characteristics of participants as information seekers were examined from three perspectives: factors that motivated them to search for additional information, their search behaviour whether active, passive, organizational memory search or trap search (Mintzberg *et al.* 1976), and their approach to searching, whether they searched themselves or asked an intermediary to search for them. Discussion of participants as information seekers begins with their investment in information seeking.

Approach to seeking

The findings related to information use within decision phases in the Information Used subtheme indicated that participants were more active in informing their critical incidents through Memory

search than Active search, and tended to look for oral, internal information rather than written, external information with minimal reference to research information. As an exploratory question, participants were asked how they typically approach looking for information to support their work. Generally, participants searched for information if they needed it, introducing new knowledge as required to meet immediate needs supporting Chatman's Proposition 6 (Chatman, 1996). The following quote suggests some participants may pre-judge the value of information with respect to whether it will make a difference to their decision.

> *I don't spend a lot of time looking for information if I am reasonably sure that it is not going to change any decision that I make. (Participant Group 4-B).*

Some described their typical approach to gathering information as "talking to people", suggesting that their approach to gathering oral information was not just about asking questions but two-way conversation, with information developing as it flows back and forth.

> *My way of seeking information is that I would probably talk to a lot of people -I like to get other people's ideas and try to find out about them and see what is out there. (Participant Group 3-C)*

> *Probably my first approach to information gathering is to talk to people. Ask people things - people say things…that would help us move this process along in a more efficient way -those conversations with people in the decisions that I make matter very much. (Participant Group 2-C)*

> *For me having a human interface, being able to talk to somebody about where to look or having somebody do some looking for me, not because I am lazy about looking, but it would be helpful.(Participant Group 3-B)*

 In rare cases, participants said they would search the literature themselves, as suggested by the following three quotations, reflecting that participants had varying degrees of confidence in their own search skills.

> *I guess I am really internet savvy -I am really comfortable about going there -sometimes I will just go there first, I will do a really broad Google search to see what pops up, then I go with affiliations and organizations … if I think it can be searched through a database then I will go to Embase, CINAHL, PubMed, those sorts of things to kind of get if there is any sort of research that been done … I try to look for information before I ask somebody else. (Participant Group 2-D)*

> *I would search for the topic …I would try to get something in there to narrow it down to more specifically what I am looking for but I don't know if I am being really good at being very specific (Participant Group 3-C)*

> *I tend to spend a lot of time gathering a lot more information than most people do. I am kind of an information junkie. You know what I mean. I look at tons and tons of information and I think how is that best going to fit … all of my weekends basically I would get up and have a tea and whatever, then start some searching, looking at something that had come up somewhere along the way and then I would end up in another direction based on the information that I had found. (Participant Group 1-A)*

One participant said they would search the literature themselves and possibly ask an intermediary to search.

> *I would do a literature search; I may get the librarian to do one for me as well. (Participant Group 1-A)*

Other participants noted that their general approach was to ask information intermediaries to search for them. Intermediaries included their own staff, colleagues awarded cognitive authority due to education, experience or expertise, students hired for the purpose, or librarians or other information gatekeepers in the organization, as suggested by the following quotations.

> *if I want something specific I am going to have to approach whoever, it might even be asking the library people to do some research for me, well I would have to be fairly specific on what I am looking for them to be able to do it -or even talking to somebody else …I really think you have to think about what you are really looking for because if you don't know that you are not going to ask the right question and you are probably not going to get the right answer. …I must admit, I am not a big internet user so I would approach someone who perhaps was or some other manager or someone outside, or if it was a very specific thing I might call a company representative. (Participant Group 2-D)*

> *I do have to do that -based on how much time do I have or am I the best person to do that type of search that I need …is it something that I need to talk to [the librarian] about or is it something I need to talk to [a colleague] about -those decisions would need to be made by me up front, I just can't go in and peruse and wander. (Participant Group 3-C)*

> *… now as I do in other instances I go right to the librarian because of the ability they have to do high level searches in a very effective manner to provide to you this is what is being documented in terms of research around best practices I think they are able to provide it much quicker in terms of searching and it is much more focused. (Participant Group 2-C)*

> *There is a little bit of information, there are articles, there are a lot of things. And that would be … one of the reasons we got a student … to actually do that kind of background work. …I didn't actually do most of it, I direct. All of it was done by the student… (Participant Group 3-C)*

Some participants described how they approached searching to meet a specific need. Whether they had fewer health services career years, were at lower or higher levels on the organization chart, or had more health services career years, participants looked first for the specific information they needed. If they did not know much about the subject they searched for a broad overview first. If they knew about the subject, then they just searched for answers to their questions, as the following quotations indicate:

> *if I need the detail, if I know exactly and specifically what I want then I will just aim for that. (Participant Group 1-2 health services career years)*

> *…it depends on the context. Sometimes I am looking very high-level stuff; sometimes I need to drill down immediately...if I know exactly what it is I need to know I will just drill down immediately to find it. (Participant Group 2-3 health services career years)*

> *I probably go narrow -I would tend to look for the bits of things -of course, it may vary too -it would depend on whether I know anything. (Participant Group 2-15 health services career years)*

> *For some reason I am more into the quick scan. I try to do a quick scan first of the big thing and then I focus in. (Participant Group 4-31 health services career years)*

> *Before I would go looking, I would try to narrow it down to the topic. When I first …knew that I was going to be involved with nurse practitioners, I looked broader. I pretty much try to cut to the chase with the information that I am looking for. I really don't want too much superfluous stuff. (Participant Group 3-35 health services career years)*

Two participants commented on their own limited capacity to narrow down their searches effectively:

> *I tend to go broad, and then I will narrow it up and it leads from this tangent to that one, to that one, to that one, then I get overdosed with too much information… (Participant Group 1-35 years of health services career years)*

> *I would search for the topic but then… try to get something in there to narrow it down to more specifically what I am looking for but I don't know if I am being really good at being very specific -it happens that I would end up with my first look and then going through those. (Participant Group 3-28 health services career years)*

Some participants commented on a different approach to learning and new information as they neared the end of their careers:

> *I have changed a lot in my career and I used to take all kinds of things home and read them, and now I have decided that I don't do [this] anymore because now I have other priorities in my life … now I go for an hour and a half walk and I think it does me better than reading articles. (Participant Group 3-C)*

> *The only thing I can say is that when you are nearing the end of your career, you tend not to go out and take on more courses or things like that and I focus on management courses and send all the staff to technical workshops instead of going myself. (Participant Group 2-D)*

Level of Effort Searching

Use of tacit knowledge to identify decision importance has been discussed in the Information and Decisions theme. This part of the section explores responses to an exploratory question about factors that influence the level of effort participants expend searching for information. The following four quotations from participants are examples of responses indicating that cost and impact were important drivers:

> *...if I know that a decision is really going to impact on an individual or on the organization - cost a lot of money -then I know I spend more time and effort in looking for what the right answer should be ... (Participant Group 3-B)*

> *I think the higher the priority -probably the cost and time we spend dealing with it in the region, number of individuals, number of clients we have would probably influence our investment.(Participant Group 3-B)*

> *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. (Participant Group 3-C)*

> *Sometimes the consequences of a wrong decision. That would be one of my biggest things on how long [I would spend searching]. For example, if I know that a decision is really going to impact on an individual or on the organization -cost a lot of money -then I know I spend more time and effort in looking for what the right answer should be… often there are deadlines -I know there are times I know that I have to make a decision and risk it and say I am going suffer the consequences. (Participant Group 3-B)*

Other participants specifically noted that although costs were a consideration, they were not always the most important factor in deciding whether to search for additional external information.

> *I am obliged to be concerned about cost but that is not my first consideration -benefit is my first consideration. (Participant Group 4-B)*

> *If it is really important that I get an answer back, I may not care about cost, I may care about patient impact. That kind of thing, but my level of effort, yes, time does affect it. (Participant Group 2-D)*

> *I am an advocate for the employees, I don't consider cost … I mean I look at cost but I try to do a cost analysis to try and demonstrate the loss and cost … so that it is evidence based, that it has been used previously, that it has been validated. (Participant Group 1-B)*

Congruent with Mooers' Law as discussed above, participants noted that supervisor support in the decision situation and their supervisor's interest in information gathered influenced their perception of task importance and their level of effort in information searching.

> *[Supervisor's support] would have an impact, they are indicating a high level of importance and accuracy … where did you get your information, who did you get that from, to support that decision, yes, it would have an impact. (Participant Group 2-D)*

> *If I know that it is not likely going to be challenged or if the person who is going to challenge me is not someone I am concerned about. If I know for example that I am researching something for [the CEO], that [the CEO] has to take that on somewhere else then I am going to be a little bit more careful about what I say. (Participant Group 3-B)*

The following quotations are examples from participants who noted that searching for information to support decisions and tasks took less effort when they had previous related experience, and that the less directly relevant experience they had, the more effort was required.

> *Well, I guess you talked about my past experience or past knowledge. If it is something that I don't know anything about well clearly that takes a lot more effort on my part to do. (Participant Group 3-D)*

> *Yes, if I have answered the question before, if I have experienced it before I will never 100% say "this is what you should do" but I will say "last year this is what we found to be the best - let's have a look and see what has changed in the past year." (Participant Group 2-D)*

> *The other thing, if I do have a lot of background -if I have done this before then I am not as apt to spend a lot of time reviewing it, I will just make a decision based on past experience. (Participant Group 3-B)*

Time factors have been discussed above in the Information and Decisions theme with respect to critical incident decisions, decision-making modes, time resources, and imposed deadlines.

Participants also indicated that time pressures had an impact on the level of effort they were able to invest in information seeking, including time available to look for information and time available to look at the information found. The following two quotations are examples of comments from participants said they did not always have the time at work to search as thoroughly as they would like.

> *Yes, but at the same time too if I have an important question I will drop what I am doing and put the effort into it -I am never going to give a half-assed answer. I have a framework that I follow when I answer questions… so it just may depend on how fast I move through that (Participant Group 2-D)*

> *I don't do things just halfway I have to do them the right way or not at all but you certainly do feel the pressure because if someone says I want you to do have this ready for me next week, well it might not be feasible that I get all the information that I need in that period of time so I might have to go back and say I haven't been able to do that … or I might have to put the time in after hours to be able to get it done. (Participant Group 1-A).*

The next quotation is from a participant who described asking intermediaries to find information, then not always finding time to review it.

> *I know I can probably call and I have in the past on occasion gotten [the librarians] to … do a literature search for me and I get this whole list of articles back and I don't have time to review it … they will do the research and I probably have two or three sitting in a folder on my desk …when I get to them I will take a look at it. (Participant Group 3-B).*

Factors that influenced the level of effort required in searching for information included time available, cost, impact of the decision, supervisor support, related experience with the subject and information already available affected the effort the search required.

Summary – Characteristics of Seekers

Participants' descriptions of critical incident decisions were congruent with their responses to questions about what they would typically do to inform workplace decisions with respect to talking to other people as a first step in informing decisions. There was more emphasis on active information searching for research information in responses to exploratory questions. Participants described searching for written information to inform their critical incident decision, whether they searched themselves or asked intermediaries to search for them, appeared to be congruent to observations by Dervin (1992) related to bridging gaps, and by McKibbon *et al*. (2002) related to background and foreground information. When faced with new problems or unfamiliar situations, these participants considered what they knew about the subject. If they did not know very much, they would look for a broad overview first, then drill down and look for the specific points they needed. If they did know about a subject, they would look for information to bridge their gaps, although not all information gaps were bridged.

There were comments that suggested participants used information they already had on hand to inform their critical incidents, and recycled information they had already used for other purposes, no participant described managing information gathered through monitoring.

Further research is needed to determine whether those involved in information gathering or information giving were functioning as information intermediaries or as information gatekeepers and whether information gathering and information giving practices were common to health service managers at all levels on the organization chart.

The next part of the section presents results related to participants' information source preferences.

Characteristics of Sources

This subtheme summarizes participant responses to exploratory questions related to their information source preferences. Participants' responses to questions about their format preferences are presented first, whether they preferred to receive their information in print, electronically or verbally. Most said they preferred printed information to both electronic information and to oral information.

> *I probably prefer to read not on the computer. (Participant Group 3-C)*

> *I would prefer that it is something in print, and not so much because I don't trust the people who are giving me the information to remember what they told me it is because my memory isn't good enough that I can always remember it. So therefore print. E-mailed is a preferred route, so e-mail is fine by me. I like to see things that I can read so am old fashioned that I print a lot of stuff. (Participant Group 4-B)*

> *The verbal piece, that's important, but I like to be able to have something in print too, because often times you need to go back to it, reflect on it and unless you have some of that in print it is too difficult to assimilate and remember all the verbal context. (Participant Group 3-C)*

Responses to this question were not congruent with critical incident descriptions where participants appeared to prefer receiving all information orally, including explicit information such as legislation and union contracts. It is quite possible that the preference for oral information reflected a preference for translation and synthesis of explicit information to make it immediately useful to support the critical incident decision.

Participants were asked with respect to oral information, whether they had a preference between stories of other people's experiences and expert opinion. As shown by the following quotations, responses were mixed indicating that these participants valued both kinds of information.

> *Personally, my preference would be through a story, because it makes the connection back to what is real and it is better than I can explain it that way to people. (Participant Group 1-A)*

> *Well I think my reaction to that choice is that I prefer anecdotal information, probably registers better. (Participant Group 3-B)*

I am satisfied that every decision should be a combination of those two things. (Participant Group 4-B)

Expert opinion …is as valuable as scientific evidence -we are talking about that with the [named program] for the province …a lot of their standards are based on expert opinion instead of scientific research. So that I think is fine. But for some of the things we do, people's stories are just as much, if not more important -if we are talking to communities and trying to make decisions around looking for people's experiences, stories are where you really get the kind of feedback you need. So it depends on the question you are asking. (Participant Group 4-B)

I would prefer expert opinion over experiences, but I think you need both, I would say you need both, especially in the kind of work that I do we are trained to really value the community voice piece, but yet that needs to be blended with expert opinion to give us the rich kind of information we need to move forward.(Participant Group 2-C).

Participants' preferences for oral vs. written information, and stories vs. expert opinion were congruent with critical incident descriptions where stories shared orally of what worked in other places were most common. Further exploration would be required to determine whether health service managers value expertise over research evidence.

Internal, Oral Information Sources

Talking to people took various forms including bringing groups together in meetings to discuss issues and consulting with one or more individuals separately to gather information. The following quotation from one participant reflected awareness of the difference between people as information sources and information channels:

…there are two kinds of knowledge, you either know it or you know where to find it. (Participant Group 3-C)

That District and departmental staff were key interpersonal information sources is suggested by the following two quotes. In these examples, staff members were both the source and subject.

We also asked the staff, what was important to them …what did you think about that, was that too short, was it too long, did it make sense to you, are we missing anything that wasn't on there, is there something that you feel needs to be [included] or how we set it up is different, so we were just getting some feedback from staff which is key because they are the ones that are out there caring For the patients, and it needs to make sense to them… right? (Participant Group 1-A)

And as we started going back and gathering data, again we are asking the staff, as we tried to formalize in a more scientific matter, tracking with the dates and time (Participant Group 3-D)

Workplace things around how our staff feel -are they satisfied in their job, do they have enough professional development opportunities -how do they mesh with things in our system… (Participant Group 3-C)

In the following two cases, although they were not the origin of the research information mentioned, staff functioned as the information consumer as well as the information channel or the information intermediary; they acquired, absorbed, filtered, translated and implemented research information to make it useful in the organization.

> *… and for some of our staff members there was the ability to draw on the literature from over the last 20 to 25 years so that body of work in journals, books and workshops is present in some form … .(Participant Group 2-C)*
>
> *…most of the things we have we would have got from literature searches … internal types of things we have done, workshops …anything that we are looking at is research someone else has done, information that someone else has provided us, we have our own basic instincts, our own knowledge base of things, but are always looking at what other people have done, what has been successful in other areas. (Participant Group 3-C)*

Congruent with observations from research, that organizational decisions tend to be hierarchical with recommendations passed upward for approval (Simon, 1977), some participants' described their supervisors' role in approving decisions, as noted in the following two quotations.

> *Because they were pricey, it wasn't a decision that I could make on my own. I had to bring it to my VP and say "would you consider these", and he was very open to that (Participant Group 2-D)*
>
> *… discussion with the VP around making sure the money is there to be able to do it. (Participant Group 3-C)*

One supervisor was involved in compiling information for approval, as in the example of the next quote.

> *Certainly … The VP was [involved]. We actually developed kind of a draft policy that went to executive so that would know that we had their support to move forward with this. Because we can't affect a change if we don't have the support of leadership. (Participant Group 3-C)*

While there were no cases where a manager's supervisor was either the origin of specific explicit information or of first-hand experiences, or acted as an information channel guiding the information seeker to a source, in one case managers at the next two levels on the organization chart were information sources with respect to process for resolving the critical incident.

> *At that point, I escalated … to say "we've got a problem" because I don't control the [other named department] group. So I talked it over with my boss, and we couldn't think of anything so we involved executive management..And the executive in question said just go and meet with the project manager of the [other named department] group on a daily basis. (Participant Group 2-D)*

Patients and clients were also personal information sources. The following two quotations are examples of responses where patients, clients and health consumers were mentioned, in the first as an information source and in the second as a perspective in decision-making:

> *And the patient satisfaction sheet is very important because it is a very important piece of information for us to understand what the customer needs are. Customers being our patients … (Participant Group 3-D)*
>
> *What are the implications going to mean for the patient, in terms of cost, in terms of convenience, in terms of nursing time, in terms of pharmacy -and I go through all of those, then I actually pick the one that is going to work best for the patient and I go through the evidence and I see whether that substantiates it, so I bring in evidence and I bring in patient preference and I make my decision. (Participant Group 2-D)*

Internal, Recorded Information Sources

One of the exploratory questions probed participants' preference related to internal, written information in the form of data, policies, agreements and other explicit information. Some said they tended not to use information gathered or created within the organization because they felt the information was biased or flawed.

> *And from what I gathered …they developed the survey…without input. …I had some concerns about the information...for instance, hearing how the questionnaire was developed - sitting around – "this is good wording", "what do you think about that" .. I think that was one area that had to be addressed -the other was the distribution … -random sampling … the idea for them for random sampling was … "I will hand this out to people in the hospital; I will try to get a couple of children". (Participant Group 1-C)*

> *I don't always feel that our data is reliable and valid, so I always kind of feel a bit uneasy so when I am presenting it I always say that because there is so much duplication in it -it is not a good system (Participant Group 1-B)*

> *I find that sometimes I am reluctant to rely on internal articles and … reports. I have this thing about some organizations being incestuous, you know …so I am often concerned that when something is done internally…they are more biased -I often think I know why they are saying that -whereas when I read something external I feel more like it is unbiased and I can listen to what that say and see how it applies here. (Participant Group 3-B)*

Others said that they did not often use internal information because there was so little available, as already discussed in decision influences above, with respect to policy and procedure information and workload performance.

> *We don't have a lot of information available [in] internal reports. I think that is probably one of the biggest constraints, for me in my role in making decisions. I don't have outcome data … we don't have a good reporting framework for the indicators going up to in my portfolio -it is getting better -but it used to be that I took every financial statement in my own portfolio -and I plugged in patient days and all that … (Participant Group 4-B)*

One participant mentioned difficulty in accessing internal information through an intermediary:

> *I ask for [data] on a quarterly basis and they always forget to send it to me. So I call them and then they send it to me for the whole district. So that is useful to me, it should be by site, and I have to go through it line by line if I want it. If I want [service] stats for a certain department, I can't do it. I would have to give that to an HR person and think for every single name look up every single department and we just don't have the manpower for it. But with the stats that I collect in the hospital, I can get that by department but I just can't show any dollar value for it. (Participant Group 1-B)*

As has been explained in the Information and Decisions theme, there was a shared view that internal information included information created outside the organization already absorbed and implemented within the District. Library document delivery and literature search services were mentioned in response to questions about internal information sources.

> *I have sent requests to [named member of library staff] for an article that somebody mentioned and I thought that would be very helpful on best practices. (Participant Group 2-A)*

> *Now, as I do in other instances, I go right to the librarian because of the ability they have to do high level searches in a very effective manner to provide to you, this is what is being documented in terms of research around best practices (Participant Group 2-C)*

The following quotes are other examples of responses to questions about internal information.

> *I also have journals and memberships in a lot of quality groups and professional quality and risk groups and get a lot of journals and newsletters and pieces of information that helps. (Participant Group 3-D)*

> *Collective agreements certainly are internal documents – I certainly looked at those. (Participant Group 3-B)*

As has been discussed in the Information and Decisions theme, working definitions for internal and external information were created to reflect that these participants appeared to consider information that clearly originated outside the organization, including research based information, to be internal if they monitored it or if they had already absorbed and applied it. This perspective on information may indicate that the District's absorptive capacity, ability to assimilate and reproduce new knowledge acquired from external sources (Cohen, 1990), is greater than results of research conducted in other health service organizations would suggest. Further research specifically exploring research uptake and absorptive capacity would be required to know whether there is a relationship between the way these participants perceive internal and external information and the organization's absorptive capacity, and whether this District differs from other health service organizations in this respect.

External, Oral Information Sources

In response to exploratory questions about information source preferences, one participant commented that although she preferred to receive information orally, her work required written records.

> *I find in that my business you have to be extremely careful about interpreting verbal opinions – so when I get verbal opinions I have to take copious notes because when I talk to [named expert] about privacy laws and what I can share and can't share, I have to take notes on that because if I am going to go to an arbitration it might be three years down the road, and I will have to refer back and if I don't have it in writing ... I like to hear things verbally, I like to listen to experiences and I don't mind talking to experts but with [named expert] for example if he is going to give me an opinion I usually like him to write it down. (Participant Group 3-B)*

Most responses to questions about external oral information sources included comments about asking counterparts with whom they had relationships in the same or similar position to their own in other organizations, or with whom they engaged in provincial committees and networks.

> *What we have done is, for example, the Directors of [named department] services in the provinces are very close with each other -so what happens is that we will send out an e-mail so what are they doing, how have they evaluated, what has been the response to that -have these particular things being done. (Participant Group 3-C)*

> *And we have staff on those [provincial] committees, and so what happens is that the issues are district formed are really in terms of how do we look at this provincially, so what comes back is in terms of provincial information (Participant Group 3-C)*

> *We have looked at … certainly borrowed information from [other health districts] … (Participant Group 3-C)*

> *And the second piece of information that I found comfort in was the policy and procedure that came from [another District]. (Participant Group 2-D)*

> *For me, the references from … [other] places that were currently using [a certain company's] work. I wanted to know how long they were using it. How satisfied they were … what was the service like when they had to call. What was staff satisfaction with this? Once I talked to at least three companies for each of these projects I got excellent, excellent feedback. It left very few reservations in my mind. That was the final decision. (Participant Group 3-D)*

Routes by which new research-based information entered the organization included conferences and workshops, as has already been discussed in the Information and Decisions theme where participants commented on importance of networking opportunities to gather more oral information and the value of oral information presented more formally. Conferences were also sources of information about other information sources. In the following example, a participant used an information source described at a conference to confirm a patient related decision.

> *I was at a conference in February, a national conference -and two different speakers mentioned the Handbook of [named subject] … and how it was geared to best practices … so I ordered the book … and have it now -then I had a situation where there was a woman I was asked to see, she was quite distraught … I came back to… the handbook … and I looked up Disorders to see whether [the intervention was appropriate for her diagnosis]… (Participant Group 2-A)*

One participant new to the organization and without the benefit of established relationships with counterparts described making "cold calls" to other organizations, reflected in the following quotation:

> *I called [organizations in two other provinces] and asked what are the next steps … I wanted to talk to the actual coordinators... (Participant Group 1-B)*

The example just given is not congruent with research by d'Alise (2010) or MacKenzie (2005) where choice of people as information sources depended first on established relationships with them.

Other external stakeholders that could provide information directly related to the context included consultants, facilitators, vendors and contractors and external experts. Use of facilitators to reach consensus, government officials to advise and consultants to gather and synthesize information has been discussed in the Information and Decisions theme. The following three quotations are examples of responses to exploratory questions that mentioned vendors and contractors. These were engaged to inform a decision with information on how something might

work or what it might cost, acting in these cases as the origin of the information as well as the information channel.

> *it helped it to develop an RFP so that the companies out there would know what we are looking for and know whether they could provide that… And then there were companies who were basically calling and saying why [don't] we come and present information to you as well. (Participant Group 3-D)*

> *And while we were doing that we contacted four companies to get information on [the subject] and looked through the chemicals as well to look at reactions between the chemicals and rubber or with the glue that might be underneath the rubber and so forth …a lot of this was going on simultaneously. (Participant Group 3-D)*

Licensed or registered professionals with expertise unavailable within the District were mentioned as credible information sources, as in the following two examples.

> *A lawyer from [named organization] … is their consultant to us -actually two different lawyers, [personal name] and [personal name] [advise] about privacy legislation (Participant Group 3-B)*

> *I feel quite confident if I go to a structural engineer that the information he will give me will good data, good information. If it is just by guess or by golly, I won't take that to the bank so I have to go back and get more credible information. (Participant Group 3-D)*

External, Recorded Information Sources

Although no participant described searching for and reading journal articles specifically to support their critical incident decision, in responses to exploratory questions about their preferred information sources, participants referred to searching databases and reading articles as part of their work routine.

> *I will go to PubMed and see if there is anything that has come out since then that will impact on those guidelines that really we should be following best practices and best practices are generally derived from the guidelines and protocols that have previously printed and developed, so I will tend to start there, unless it is an itty bitty question that is not going to be covered in the guideline… (Participant Group 2-D)*

Some participants said they would prefer having have synopsis of articles and reports to one or more original documents.

> *Not really a journal -more in terms of a topic -what I would like to do at some point would be to make particular topic pieces. Then I could do in and say 'depression" or "autism" or whatever, and all of a sudden I would be able to have all of the information in the journals or whatever that we would normally go to. (Participant Group 3-C)*

> *I like journal articles because I am a scientific type person. I love when things come in a table, when information is summarized for me -I like really good synopses, I like Cochrane's database (sic) , or something that takes all the information and puts it into one big pellet for me to digest and chew because it is digestible in that format, I appreciate that. (Participant Group 2-D)*

> *Can I get through those thirty papers? Oh my god I can't do that …would you summarize it for me please. I guess when you look at it, what I want is a synthesis document that pulls a*

> *bunch [together] as opposed to thirty documents, is there one that pulls thirty together … that would be very helpful (Participant Group 3-A)*

There were varying opinions on usefulness of written government reports, as suggested by the following quotations from two participants.

> *We [were] able to rely on other bit of good data collected in the [critical incident subject], prevalence studies done in Nova Scotia over the last decade. So were able to pull that into the mix. (Participant Group 2-C)*

> *I find government reports are not very scientific and brush the surface with broad strokes (Participant Group 1-B)*

Rather than depend on newspaper, television or radio reports as information sources, participants considered them as starting point to guide them to a dependable source. Media reports were therefore used as impersonal information channels by participants.

> *It would have an effect on the fact that I would want to research that some more, what journal articles, what newspaper was that printed in -what is it saying, it is press release from a drug company that is probably going to be biased in the presentation of their information, it would spark me to look into it because I would know there is going to be backlash from the article, there are going to be questions from the community …Of course, I am going to want to know what is the biased and fair representation of that evidence so that I can answer that question. (Participant Group 2-D)*

> *I find sometimes in the media they only give a brief summary, on the news or, so and I don't pay much attention to that -I need more details, but if there was an hour long program on CBC about reducing injuries in nursing homes or hospitals, an hour long documentary, yeah, I would watch it. there is no harm in watching that and determining whether I have missed anything. (Participant Group 2-C).*

This part of the section included descriptions of searching for information, including purposefully searching for research-based literature accessed through databases and found in journal articles, government reports and databases. The next part of the section describes challenges experienced in accessing information.

Barriers to Information Seeking

As an exploratory question, some participants were asked about the specific barriers that prevented them from accessing the information they needed. Responses were examined with reference to intervening variables identified in research (Wilson and Walsh, 1996b). Some participants said that they could access all of the information they wanted and needed.

Difficulties accessing internal workload performance data were described, as has been mentioned in the Information and Decisions theme, and noted in the following two quotations.

> *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. (Participant Group 3-C)*

> *I still don't know what the ratio of technicians to [specific health professionals] should really be, when it comes to running a clinical [service]. At this moment, I still don't know where to find that. (Participant Group 2-D)*

Others had specific unmet needs.

> *Best practices, that is really the only [gap] … but it is huge. (Senior Management, B)*

> *So if I was looking for anything at all it would be … what is out there that helps anybody in our business affect behaviour change -how to actually can get that knowledge that people have, translated into something that they do, that actually makes them make a change. (Participant Group 3-C)*

Of the intervening variables presented by Wilson & Walsh (1996b), time, geography, economics and lack of specific information-related training and health information management infrastructure were barriers to information seeking for this group. Time was a prevalent environmental barrier mentioned by a number of participants. As noted in Motivation to Search above, constraints limited the time spent looking for information and the time spent reviewing information found by intermediaries. Education was mentioned frequently as a barrier, not just with respect to information seeking, but also with respect to information access and management skills, as suggested by the following four quotations.

> *Within myself in taking the time to learn how to use things like the drug information, Micromedix, once you get used to how to get them you can go to them, but trying to find the time, that is the hard part. (Participant Group 1-A)*

> *Yes, really the biggest barrier is having the time to actually to go looking at that-the other thing is using the resources appropriately and just asking for help and knowing when to ask for help as opposed to thinking that you have to do it yourself (Participant Group 3-A)*

> *I often think my level of computer skill in figuring out how to find information is the biggest barrier (Participant Group 2-A)*

> *… next biggest barrier in this particular job is knowing where there are other resources (Participant Group 3-B)*

Economic variables were barriers on an organization-wide scale. Funding limitations resulting in lack of access to technology, and lack of information management were identified as barriers to information seeking, as suggested by the following two examples

> *Computers for our staff on their desks there is a cost factor but it is slow -now we have resource computers in our centres they can go to and look for information. (Participant Group 3-C)*

> *The lack of a [service area] information system.. I can't tell you [figures for] workload management, case management, program activity and output. (Participant Group 3-C)*

Slow uptake of technology was a barrier that bridged education, geographic and environmental variables, as more rural parts of the District are still without Internet access.

> *That is a barrier … some people who [don't use e-mail] or don't feel comfortable with e-mail (Participant Group 1-C)*

Other personal barriers or characteristics, emotional variables, demographic variables, social/interpersonal variables or source characteristics, including credibility and channels were not mentioned as issues for these participants. Therefore, the list of intervening variables (Wilson and Walsh, 1996b) was less useful as a framework within which to use in examining obstacles or challenges experienced by this group of information seekers.

As discussed earlier, most participants described satisficing in their critical incident decision, making decisions without all of the information they initially wanted and would like to have had. This suggests that further exploration of participants' differentiation between information wants and information needs might be useful.

Summary of Information and Seeking Theme findings

Participant responses about information seeking were homogenous in that personal information sources were preferred as both information channels and as the origin of information. Some participants enjoyed the convenience of being able to share information electronically but the majority of participants preferred to read from printed paper.

These results were congruent with the literature in that these managers preferred people as information sources (Clark, 1998). The findings about critical incidents differed from research suggesting that the managers relied often on internal information obtained from subordinates one or two levels down (Myerson, 1999). Aside from critical incident situations that involve staffing shortages within the managers' own department, these critical incident situations were generally informed with information from individuals from other departments or heterogeneous groups made up of individuals from different departments.

Responses to critical incident questions and exploratory questions were congruent in that "talking to people" was a general first step in informing workplace decisions. Beyond that, there was some discrepancy between participants' descriptions of how they informed their critical incident situations, and what they said they would typically do when faced with an information need. In critical incident discussion, participants described using internal data and organizational knowledge shared orally with them. In responding to exploratory questions about source preferences, some said they were suspicious of written information generated within the organization and many said they would actively search for research information or have an intermediary search for them.

Although there were no questions specifically about information management, that information management infrastructure was insufficient to support decision-making was clear throughout participants' responses.

4.6 Respondent Validation

The approach taken to address the validity of responses is described in Subsection 4.3.6. This section discusses responses from participants regarding the summarized findings. Ten participants shared the views that the summary accurately represented points raised during their interview without missing issues important to them, and accurately represented AVH health managers' information behaviour as it was in 2005-2006. Comments were as follows:

This appears to be a thorough and detailed well-organized summary. (Director)

Great job synthesizing information and pulling out themes (Director)

I thought the summary accurately reflected AVH of, 2005-2006. The summary was quite informative – interesting to see this as an 8 page brief (Director)

It was interesting to review and to see that the content of the summary of the interviews was so closely aligned to my own experience. I look forward to viewing the research as it proceeds. (Manager)

Continues to be reflective of the current situation. Difficulty finding time to keep up in my field continues, finding time to review information after requesting and receiving it (e.g. lit search) is still a challenge. Lack of information management systems for decision support remains an issue. AVH is working on a decision-making framework to assist senior management and others in making decisions at various levels in the organization (Participant Group 4-B).

I think this is a wonderful snapshot of how most of us feel most of the time. Thanks for putting it in print. (Manager)

I appreciate the summary. It provides a clear breakdown of the issues discussed. (Manager)

The remaining participant's responses differed from the others in only two respects. This participant noted that the summary did not note the difficulty finding specific information to support health administration. This participant also questioned that the following findings were typical of the AVH in 2005-2006:

- All participants described decision situations that were unstructured or unique.

- Participants with more experience with a subject tended to look for specific information first.

- Participants with less experience with a subject tended to search broadly first and then drill down to specific information.

- No participant said that they found new research-based information that made a difference to critical incident decision outcomes.

These points were reconsidered but not changed.

4.7   Study Conclusion

This First Interview Study contributes to what we know about decision complexity and managers' roles and increases our understanding of how health service managers need information in their work. When information used to inform critical incident decisions was classified by category and type, pooled and mapped to decision phases, the four findings were identified for further inquiry:

1. That these health service managers used information throughout the decision process (Saunders and Jones, 1990; Treacy, 1981).

2. That these health service managers informed decisions with over fifty different information types. These could be classified by the three broad categories (explicit, tacit and cultural) identified by Choo (2006).

3. That internal information was used first, and external information was accessed only if there was a gap that had to be bridged and the decision-makers thought it would make a difference.

4. That the dominant means of acquiring information described by these health service managers was information sharing rather than information seeking.

The study results included four observations not completely explained, for further exploration:

- It was not clear from these findings how research information, particularly new research, enters the organization. Participants did not appear to inform critical incident situations with research information; yet the researcher was certain many of these same participants regularly requested information search and document delivery services.

- Meetings seemed to be important in these participants' work but the extent of their reliance on them was not clear. Oral information sharing in meetings appeared to be their preferred way to inform group decision-making. Participants described calling co-workers together in a meeting to ask them to tell what they knew that was relevant to critical incident situations more often than they described consulting with a series of co-workers individually.

- Another observation is that these health service managers satisficed, that is, they made decisions without all of the information they initially identified as needed; however, the reason for satisficing was not clear. Whether there may be a relationship between satisficing, changing information value, inadequate information management infrastructure or inappropriate information quantity was not clear. It was not clear whether

they assigned the same value to all of the information they felt they needed, or whether the values were consistently assigned to the same information types or whether values changed. Participants indicated that their workplace was served with inadequate information management infrastructure in terms of both systems and skills, and that certain types of information were needed that were not available within the organization. Comments also revealed that participants were challenged with too much information in some situations and not enough in others, such that some situations could be characterized as information poverty while others as information overload.

- It was also not clear whether any existing information behaviour models adequately represented the information behaviour of these health managers. These participants did not appear to follow a linear process when informing their decisions. Their processes appeared to involve groups meeting to consider an issue where a series of different types of information were considered from multiple perspectives until the group was comfortable enough with the information they had to make a decision.

These issues are explored in the next two Chapters. Part 2 of the research is described in Chapter 5, a Calendar Study to quantify opportunities for health service managers to meet. Part 3 of the research is described in Chapter 6, a Second Interview Study that explores health service managers' information sharing behaviour.

Chapter 5 Calendar Study

5.1 Introduction

The First Interview Study findings (Chapter 4) suggested that participants were more active in information sharing than in information seeking, and that their decisions tended to be informed through information shared orally and in groups. Before exploring aspects of information sharing further, it was necessary to gain an understanding of the opportunities available for these health service managers to meet in groups.

The calendar study, described in this chapter, was designed as preliminary to the Second Interview Study.

5.1.1 Definitions

The word "group" has been used generically through the remainder of this thesis to mean "a relatively closed and fixed ensemble of people sharing the same 'goal' and engaged in incessant and direct communication" (Bannon, 1991). A group could be a department, a committee, a portfolio, a team, or a number of people called together at least once to address and provide perspective on a specific situation. Not all groups are teams. A team exists and adapts over time (Toms *et al.* 2008) with "the capacity to share a common information need and similarly to share in the information activities required to fulfil that need" (p. 4).

5.1.2 Research Aims and Objectives

The Calendar Study's overall aim was to determine whether the role of information sharing at meetings was sufficiently important in health service managers' work to be the focus for a second exploratory interview study. The objectives were to determine the number of opportunities for group information sharing that took place, and the number, composition and frequency of different groups that meet. The results were used to develop and focus specific interview questions about information sharing during the Second Interview Study described in Chapter 6, a follow-up to the First Interview Study described in Chapter 4.

5.2 Calendar Study Methods

A search of the literature failed to identify research that could be used to guide the study or develop study protocols for this type of calendar analysis. A systematic research plan was developed to allow the process to be inspected (Patten *et al. 2*005) or repeated (Mays and Pope, 1995).

5.2.1 The Data Source

The Calendar Study was undertaken in January 2008 so calendar data for the 2007 year were used.   In 2007, each of the six sites at Annapolis Valley Health had at least two main meeting rooms typically used for larger meetings. These could be booked by any employee using a Microsoft Outlook^{TM} calendar.

Calendar data from January through December 2007 were extracted and analyzed. Data included the booking subject, location, day of week, time of day (morning, afternoon, evening), meeting duration and meeting frequency (if the booking used Outlook's recurrence feature). Additional information, including the names of the organizer and number and names of invited participants, etc. were linked to the booking record but not part of it and so were examined individually as required to identify aspects that were not clear. Agendas and supporting information were rarely recorded; therefore, these data were neither extracted nor analyzed.

5.2.2 Thematic Framework for Meeting Characteristics

Meetings were indexed using dimensions identified as appropriate for typical organizational meetings (Romano and Nunamaker, 2001; Panko and Kinney, 1995; Panko, 1992) and by meeting aspects important to this study. These included group size, meeting location (meeting room, office, phone), and group structure (whether formal with regularly scheduled, recurring meetings or single-issue meetings).

5.2.3 Data Preparation and Analysis

Room booking data from each of the 20 calendars were downloaded into MS Excel^{TM}, grouped and sorted. The separate files were merged into a single Excel^{TM} file with 8,686 records. Strings of time and date data in one field were separated into four fields, one each for date, day of week, start time and end time. Some records included brief messages to participants; these were included in a memo field.

All data were imported into a single MSAccess^{TM} table. Information in the subject line was used to index bookings by activity and participant. Categories developed for activities included meetings, education, self-help, clinics and room maintenance. Categories of participants included employees, volunteers (including Board members), patients, physicians, community partners, government representatives and vendors. Meeting organizer and participant lists were checked when either of these two dimensions could not be determined from the subject line. Any that remained unclear were excluded from further analysis.

Group names were not standardized within the Calendar. For example, entries for the third Tuesday of each month for a specific meeting room were labelled "Occupational Health and Safety", "OH&S", "Occ. Health", and "Site OH Meeting". Additional information including meeting organizers, participant names and memos were checked so that group names could be

standardized with a common group name. This process identified series of meetings that appeared at first to be single meetings but were found to recur.

Upon inspection of consolidated data, there appeared to be numerous duplicate bookings of two or more meeting rooms for the same, or similarly named groups for the same date and time, not always at the same site. For such bookings, it was not clear whether the extra rooms were used for breakout sessions, booked to assure privacy in adjacent rooms, or calendar booking errors. Bookings for the same participants at the same time but in different sites, and in rooms at the same site but not adjacent (so apparently not booked to assure privacy) for groups so small as unlikely to need breakout sessions were considered calendar booking errors, amalgamated and allocated to the most central location to avoid double counting.

Meetings attended only by employees (managers and staff) were examined for recurrence and attendance and scrutinized to determine whether the group was *homogenous*, drawn from a single department, program or portfolio, or *heterogeneous*, having participants from different departments, programs or portfolios.

5.2.4 Reflexivity

The Outlook^{TM} Calendar structure standardizes entries of date, time and location. Other content not standardized that required interpretation to classify, included the name, nature and composition of groups, whether participants were managers, staff or members of other groups, and the likelihood of any booking being a duplicate or cancellation.

As a health service manager, the researcher used both her own knowledge of managers, staff and district activities as well as her access to other district records such as meeting minutes and participants' Microsoft Outlook^{TM} Directory entries to determine and confirm organizational roles and meeting subjects.

5.3 Study Results

This section begins with an overview of the activities in these large meeting rooms, then focuses on meetings that health service managers would be expected to attend.

5.3.1 Overview

Data from all bookings in Annapolis Valley Health's 20 large meeting rooms have been summarized in Table 5.1 by activity, participants and time of day.

Activity with Likelihood of Managers' Participation	Participants	TOTAL		morning		Afternoon		all day		evening	
		N	%	N	%	N	%	N	%	N	%
MEETINGS	Not clear*	360	4.89%	106	1.44%	189	2.57%	31	0.42%	34	0.46%
✓	External	130	1.77%	14	0.19%	23	0.31%	1	0.01%	92	1.25%
✓	Patients, families, general public	231	3.14%	32	0.43%	97	1.32%	7	0.10%	95	1.29%
✓	Volunteers	263	3.57%	55	0.75%	51	0.69%	7	0.10%	150	2.04%
✓	Physicians	34	0.46%	2	0.03%	8	0.11%		0.00%	24	0.33%
✓	Employees & External Partners	172	2.34%	41	0.56%	65	0.88%	37	0.50%	29	0.39%
✓	Employees & Government Reps	29	0.39%	12	0.16%	3	0.04%	5	0.07%	9	0.12%
✓	Employees & Volunteers	46	0.63%	3	0.04%	13	0.18%		0.00%	30	0.41%
✓	Employees	4708	63.98%	2261	30.72%	1445	19.64%	587	7.98%	413	5.61%
Subtotal Meetings		5973	81.17%	2526	34.33%	1894	25.74%	675	9.17%	876	11.90%
EDUCATION	Not clear*	47	0.64%	8	0.11%	9	0.12%	23	0.31%	7	0.10%
✓	External, including Government	1	0.01%		0.00%	1	0.01%		0.00%		0.00%
	Patients, families, general public	729	9.91%	159	2.16%	145	1.97%	240	3.26%	185	2.51%
	Physicians	117	1.59%	27	0.37%	42	0.57%		0.00%	48	0.65%
✓	Volunteers	8	0.11%	2	0.03%	2	0.03%		0.00%	4	0.05%
✓	Employee-only	272	3.70%	75	1.02%	119	1.62%	63	0.86%	15	0.20%
Subtotal Education		1174	15.95%	271	3.68%	318	4.32%	326	4.43%	259	3.52%
SELF HELP & SUPPORT	Not clear*	1	0.01%		0.00%		0.00%		0.00%	1	0.01%
	Patients, families, general public	171	2.32%	7	0.10%	1	0.01%	7	0.10%	156	2.12%
Subtotal Self help & support		172	2.34%	7	0.10%	1	0.01%	7	0.10%	157	2.13%
OTHER											
Clinics	Employees & Patients	30	0.41%	9	0.12%	11	0.15%	10	0.14%		0.00%
Total Bookings for Meetings, etc.		7349	0.9987	2813	0.3823	2224	0.3022	1018	0.1384	1292	
Room Maintenance*	Employees	10	0.14%	2	0.03%	2	0.03%	6	0.08%		0.00%
TOTAL		7359	1.000	2815	0.3826	2226	0.3025	1024	0.1392	1292	0

Table 5-1 Breakdown of 7,349 Room Bookings by participant, activity, time of day and likelihood of health service managers' participation.

The three most frequently occurring reasons for the bookings (N= 7,349, 100%) were meetings (N=5975, 81.28%), education (N=1,174, 15.97%), and self-help sessions (N=172, 2.34%) such as Alcoholics Anonymous. Least frequent reasons for bookings were clinics (N=30, 0.41%) such as footcare clinics and room maintenance such as painting or repair (N=10, 0.14%). Activities that started and ended in the morning occurred most frequently (N=2,806, 38.13%), with afternoon-only activities next most common (N=2,226, 30.25%).

Participants in these activities (N=7,349, 100%) included employees (managers and staff), physicians formally associated with the District, patients and clients, volunteers and external partners. Volunteers include members of the governance board, community health boards, fund-raising foundations and women's auxiliaries, and hospital volunteers. External partners included vendors, government workers and colleagues from other districts. The researcher used her knowledge of meetings, education and self-help activities to identify bookings likely to include Managers as participants. These are marked with a ✓ (a tick mark) in the first column.

Meeting Cancellations and Updates

Bookings were changed at a rate of 15%. Some cancellations were handled using the Outlook^{TM} delete feature (N=666, 8%) and others by adding notes to the booking label (N=44, 1%). Other bookings were updated (N=594, 6%) by changing the Outlook^{TM} date and time field. It was not possible to determine whether there were more cancellations for one type of activity than another or for one group of participants or another.

5.3.2 Employee-only Meetings

The Second Interview Study relates to health service managers' information sharing, therefore only the 4,708 meetings of employees were analyzed further. Of these, 1,624 bookings were eliminated on closer inspection because they were either duplicate bookings, bookings not cancelled properly or they were routine union meetings attended only by members and not by managers. Health service staff belong to one of five different unions; managers do not belong to a union so do not attend routine union meetings.

5.3.3 Analysis of Managers' Meetings by Date, Month and Weekday

The remaining 3,084 bookings with health service managers as probable participants were examined by date (Figure 5-1), by month (Figure 5-2), by and by weekday (Figure 5-3). The mean number of meetings per month was 257, with peaks in January and October (Figure 5-1 and Figure 5-2) and as many as 28 meetings in a single day in October 2007 (Figure 5-1). There was slight fluctuation by month in spring, autumn and winter and fewer meetings during the summer vacation period and December holiday season (Figure 5-2).
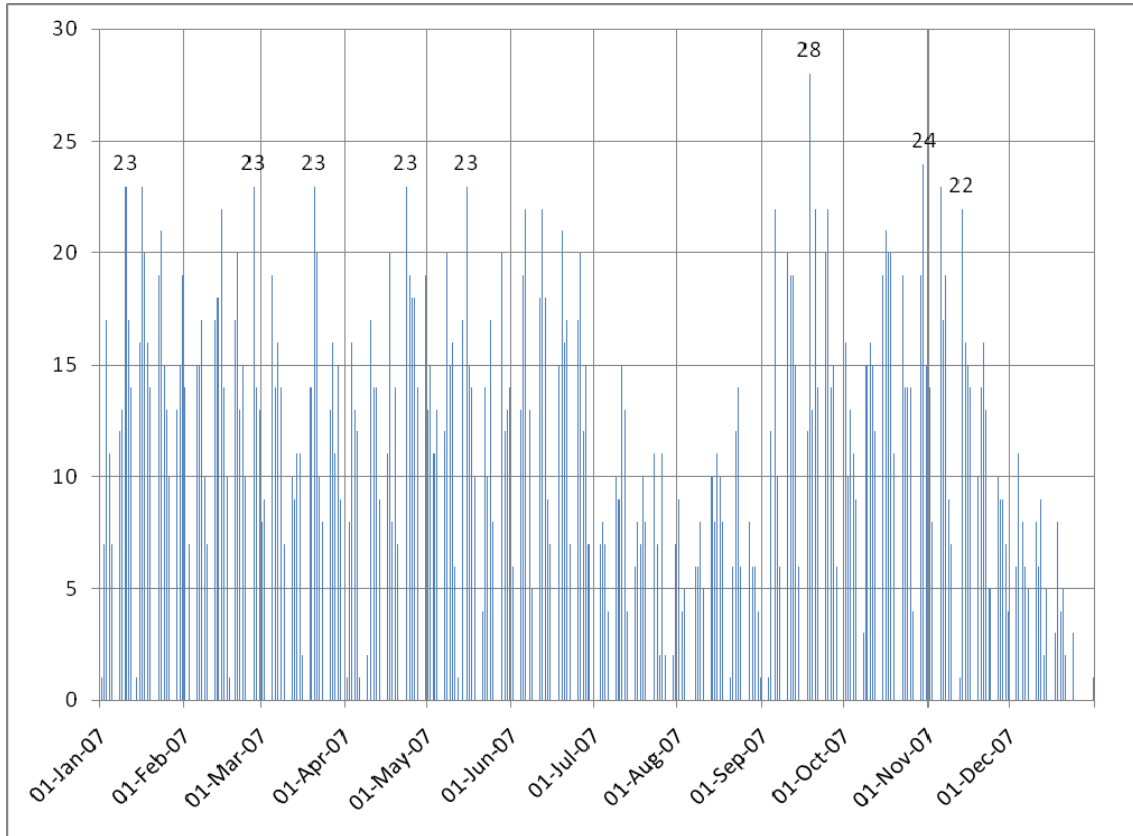
Figure 5-1 Employee-only meetings that likely involved managers, by date, in 20 Large Meeting Rooms, 2007
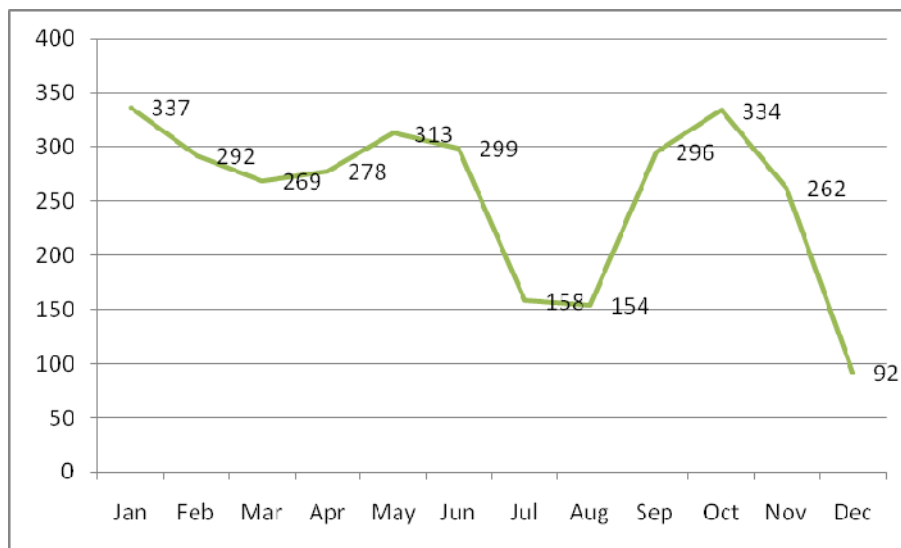
Figure 5-2 Employee-only meetings that likely involved managers, by month in 20 Large Meeting Rooms, 2007

There was slight fluctuation by month in spring, autumn and winter and fewer meetings during the summer vacation period and December holiday season (Figure 5-2).

The weekday chosen most frequently for meetings was Tuesday, followed by Wednesday (Figure 5-3). In 2005-2006, the Senior Executive encouraged Managers to try to keep Fridays free of meetings. Consequently, only meetings that could not be scheduled elsewhere in the week were scheduled on "meetingless Fridays".
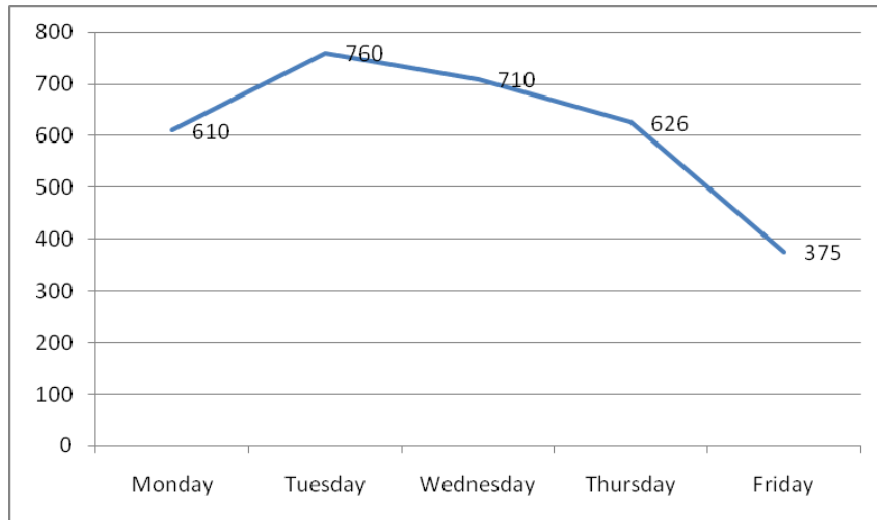
**Figure 5-3 Employee-only meetings that likely involved managers, by weekday
In 20 Large Meeting Rooms, 2007**

The largest number of meetings in these meeting rooms that health service managers would be expected to participate in on a single day was 28 (Figure 5-1) with 12 (11.90) meetings per day the mean, 14 meetings per day the mode, and 13 meetings per day the median. There were 26 weeks in 2007 when 15 or more employee-only meetings were held on a single Tuesday (Figure 5-4). Figure 5-4 shows that encouragement to have "Meetingless Fridays" was effective in 2007.
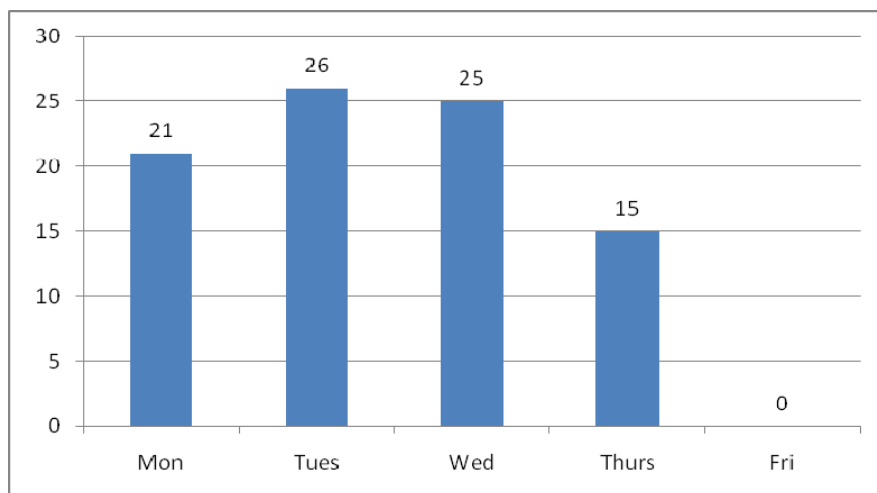
**Figure 5-4 Numbers of Weekdays in 2007 with >15 employee-only meetings that probably
involved managers in 20 large meeting rooms**

Analysis by date, month and weekday contributed to our understanding of managers' workload.

5.3.4 Recurring Meetings

The 3,084 bookings with health service managers as probable participants were examined for recurrence; 343 groups were identified with at least two meetings at the same site, the same organizer, a majority of common participants, the same or closely related subject labels, and parallel dates, days of the week, month or quarter. Of these, 84 groups met at least quarterly.

5.3.5 Departmental and Interdepartmental Meetings

Of the 84 groups that met at least quarterly, 40 were *homogenous,* with participants coming from a single portfolio and 44 of the 84 were *heterogeneous*, with participants coming from more than one portfolio. Only 15 of the 44 heterogeneous groups that appeared to meet regularly did not involve either individual patient care or human resources issues such as staff interviews, performance appraisals, discipline meetings, or meetings with unions.

Several of the 15 heterogeneous groups are likely to have included both managers and staff and may have included members of the public as representatives from the community.

5.3.6 Small Group Meetings

There were 539 bookings labelled only with first names, for example 'Mary, Jane and Susan" that appeared to be one time meetings. The topic of these meetings was seldom included in calendar data and it was not possible to determine from the calendar whether participants were from one or more departments.

Research that explores the nature and purpose of managers' work generally looks at scheduled and unscheduled meetings (Jones and McLeod, 1986; Mintzberg, 1973). All of the meetings analyzed for this Calendar Study were scheduled. Scheduled informal, small group meetings accounted for 1/6 of the bookings for these large group meeting rooms. In the researcher's experience, one reason why two or three managers might book a large room to meet would involve working on paper and needing room to spread out on the table or mount flip charts sheets on the wall.

The next section discusses these results with respect to design of the Second Interview Study to explore group information sharing behaviour (Chapter 6).

5.4 Study Conclusion

This documentary analysis of 2007 meeting room bookings met its original purpose by quantifying opportunities for managers to share information. It provides some insight into health service managers' attendance at meetings, including that managers may spend at least as much time in meetings than in their own departments.

Three areas were selected for specific inquiry in the Second Interview Study: time spent in meetings, recurring formally structured meetings, and one-time small group meetings.

A key finding of this calendar study concerned the number of small groups meeting in large rooms rather than in offices or smaller departmental meeting rooms. This finding gave rise to questions about the nature of these small group meetings. These related to their purpose, how they differed from larger, more formal meetings, their number and frequency, and whether their actions and decisions were recorded in writing.

Participation in employee-only meetings was just one of eleven information sharing opportunities for managers, as noted by the tick marks in the first column of Table 5-1. There were up to 28 employee-only meetings on a single day in 2007 (Figure 5-1) with a mean of 12 meetings per day. There were 87 weekdays in 2007 when 15 or more meetings were held (Figure 5-4). These figures do not include meetings held in managers' offices, departmental meeting rooms, by phone and by videoconferencing.

It was not possible to determine how much time an individual manager spends in meetings from this data.   Arising from this part of the calendar analysis, the question "How much of your time at work do you spend in meetings?" was added to interview questions planned for the Second Interview Study.

This calendar analysis indicates that 84 of 343 named groups that met more than once in 2007 met at least quarterly. Another 539 meetings labelled only with personal names appeared to meet just once. These two findings suggest that not all of the meetings health service managers attend are recurring meetings of formally structured groups. The 84 named groups with more frequent meetings would be expected to have terms of reference, mandates, executive sponsorship, rules of engagement and meeting agendas to guide meetings, and meeting minutes to record decisions and actions. It raises the question of whether, and how, health service managers use meeting minutes of more formally structured groups, how many informal meetings managers attend compared with formally structured meetings, and how decisions and actions of informal groups are recorded.

Arising from this part of the calendar analysis, two additional questions were added to the list of questions planned for the Second Interview Study. These were "How many AVH committees or working groups do you meet with regularly?" and "When do you tend to refer to meeting records, such as minutes of meetings?".

There were 539 bookings labelled only with several first names that appeared to be small groups that met only once. These larger more central meeting rooms that typically seat 20 or more people are tightly scheduled. The reason for their use for groups of two or three people was not

clear, given availability of smaller departmental rooms that are easier to book and meeting space in most managers' offices. This gave rise to questions about the frequency and nature of managers' participation in what appeared to be informal, small group meetings and also whether there are records for less formal group meetings.

Three questions were added to explore these informal meetings. These were "Do you participate in many informal, small group meeting? Can you tell me about these?", "How many of the meetings you attend would be small group meetings?", and "How are informal small group meeting actions and decisions recorded?".

Characteristics of naturalistic decision-makers include multiple conflicting priorities (Lipshitz *et al. 2*001). The rate of cancellation and rescheduling of meetings suggests sudden changes in plans that may arise out of conflicting priorities. It may also contribute to participants' satisficing, making decisions before all of the information identified as required might be gathered. There were no immediate implications of this finding for the interview schedule.

The next chapter, Chapter 6, describes a second qualitative study conducted as follow-up to the First Interview Study (Chapter 4). This Second Interview Study explores the information that health service managers need, share and use when they make group decisions. It also investigates issues related to group information sharing, including managers' time spent in meetings and establishing credibility of oral sources.

Chapter 6 The Second Interview Study[*]

6.1 Introduction

This Second Interview Study built on observations and unanswered questions that emerged from the First Interview Study and the Calendar Study. It extended what was learned in the First Interview Study about the information health service managers use to support decisions, and their group information sharing practices.

The First Interview Study and the Second Interview Study shared a broad research topic. Both were exploratory, descriptive studies that used semi-structured interviews with CIT and exploratory questions as the main data gathering technique. However, the Second Interview Study also used a card sorting exercise, its focus was on group information rather than individual information, and its units of analysis were information transactions rather than the information used in each case. This Chapter begins with discussion of the Research Aims, Objectives and Questions that shaped this Second Interview Study.

6.2 Research Aims, Objectives and Questions

The Second Interview Study had three general aims related to understanding the information behaviour of health service managers. These general aims and the objectives and research questions associated with them are outlined in this section.

The first two general aims will help answer the main research question identified in Chapter 1. That question was:

> What are the information needs and uses of health service managers, what are their information behaviours, and what are their barriers and challenges?

General Aim 1: To find out more about the information that informs healthcare services managers' decisions by understanding the information used to support decisions, and the issues and problems associated with supporting decisions with information.

The specific objectives and the research question(s) associated with this first aim were:

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[*] Part 1 of this research is called the "First Interview Study" while Part 3 is called the "Second Interview Study". These were two separate interview studies with no participants interviewed in both studies, i.e. not a longitudinal study.

Chapter 6. The Second Interview Study

Objective 1: To identify whether health service managers use a mix of sources, categories, subcategories, types and forms of information to support decisions.

The research questions associated with Objective 1:

- Do healthcare services managers support decisions with just one type of information or do they use one or more different types of information?

- Do these managers use the same information as identified in the Phase I Study?

- What other information do they use?

Objective 2: To explore whether there is a consistent order of need with respect to information, whether internal information is needed first and then external, or whether a consistent value is assigned, such that some is critical and needed first, without which a decision cannot be made.

The research questions associated with Objective 2:

- Is there a consistent order of need with respect to information?

- Can a value be assigned to information such that some is critical and needed first without which a decision cannot be made?

Objective 3: To determine why these health service managers satisfice, and whether and how they are challenged by inappropriate information quantity, and whether there is a relationship between satisficing and information quantity.

The research questions associated with Objective 3:

- Are these healthcare services managers challenged either by too much or too little information?

- Can these both occur in one decision situation?

General Aim 2: To find out more about health service managers' group information sharing practices.

The specific objectives and the research question(s) associated with this second aim were:

Objective 4: To find out more about the role of scheduled meetings, including informal, small group meetings in these health service managers' work.

The research question associated with Objective 4:

- What is the role of meetings in these healthcare services managers' work?

Objective 5: To investigate whether written information has a role in group information sharing, particularly in the form of meeting records.

The research questions associated with Objective 5:

- What is the role of written information in group information sharing to support decisions, specifically what role do meeting minutes play in health service managers' decision-making?

Objective 6: To determine whether, and if so how, health service managers assess oral information for credibility and value in group settings.

The research question associated with Objective 6:

- What are the practices of these healthcare services managers in assessing oral information for credibility in group settings?

The third general aim was designed to answer the secondary question introduced in Chapter 1: What information seeking models best represent the information needs of this group?

General Aim 3: To find out more about health service managers' information behaviour generally.

The specific objectives and the research question(s) associated with this third aim were:

Objective 7: To understand these health service managers' information behavior generally.

The research questions associated with Objective 7:

- What is these participants' dominant information behaviour?

- What existing information behaviour models best represent the behaviours of these managers?

This section has outlined the general research aims, the specific objectives and research questions associated with each. The following section describes how these general research aims, their specific objectives and the research questions associated with these influenced study design.

6.3 Methods

This section describes the approaches used in designing and conducting the research for this study.

6.3.1 Study Design

Once a decision was made to conduct a second, qualitative exploratory interview study, approaches that has been used or recommended for studying information sharing were considered.

Of Taylor's (1991) suggested three approaches for studying information sharing, the *technologic*al approach considers the physical attributes, dimensions and mechanics of the information containers or systems. The *content-driven approach*, involves classification, indexing and ordering of information and the *user-centred approach* stems from the human concern with the subject classification and ordering of knowledge and information. None of these approaches was deemed appropriate because this study will not answer specific questions that involve technology, nor seek to classify information further. The *user-centred approach* which considers the user, their uses of information and the context within which the information was being used (Taylor, 1991) seemed more suited to a decision-making study than to an information behaviour study.

Jones *et al.* (1994; 1986) used information logs to gather information in two ten-day studies of managers and their secretaries. The secretaries logged information they observed; managers added to the list and then rated the information transaction for perceived value. Few of these health service managers have secretaries. In addition, this approach would require more time than these health service managers were prepared to give and would be more appropriate for individual decisions than group decisions.

Sun and Yen (2005) suggested that information sharing be considered by asking four questions: 1) What to share, 2) With whom to share, 3) How to share, and 4) When to share. These questions appeared to be of limited use for a study of group information sharing that focused on oral information sharing in meetings, as these specifications answered three of the questions.

None of these three approaches seemed to be suitable for this Second Interview Study. The researcher needed to be able to balance freely exploring group information sharing in meetings, with controlling interview time, and with gathering answers to questions on specific issues, including satisficing and inappropriate information quantity, role of meetings and written meeting information, and assessing information for credibility and value. Balancing these factors required three different approaches to gathering information.

General Aim	Research Question	Critical Incident	Exploratory Interview	Card Sorting Exercise
To find out more about the information that informs healthcare services managers' decisions	Do healthcare services managers support decisions with just one type of information or do they use one or more different types of information?	✓		✓
	Do these managers use the same information as identified in the Main Interview Study?	✓		✓
	What other information do they use?	✓		
	Is there a consistent order of need with respect to information?	✓		✓
	Can a value be assigned to information such that some is critical and needed first without which a decision cannot be made?			✓
	Are these healthcare services managers challenged either by too much or too little information? Can these both occur in one decision situation?		✓	
To find out more about healthcare services managers' group information sharing practices.	What is the role of meetings in these healthcare services managers' work?		✓	
	What are the practices of these healthcare services managers in assessing oral information for credibility in group settings?		✓	
	What is the role of written information in group information sharing to support decisions?		✓	
To find out more about healthcare services managers' general information behaviour	What is these participants' dominant information behaviour?		✓	
	What existing information behaviour models best represent the behaviours of these managers?	✓		

Table 6-1 General aims, research questions and methods used in the Second Interview Study

A three-part interview strategy with Critical Incident Interview Questions, Exploratory Questions and a Card Sorting Exercise was designed. The Critical Incident questions would allow participants to steer discussion about information and meetings so the issue could be explored without restraint. A card sorting exercise using the same critical incident would make thinking about comparative value of a large number of specific information types more concrete for the participants in a way that questions could not. Exploratory questions would help ensure specific questions that remained from the two earlier studies would be answered. The strategy has been summarized in Table 6-1.

Participants were asked to think of a recent particularly effective meeting within which a group made a critical decision. Discussion could focus on the information receiver as well as the giver, the information shared, including its source; the information giver's own perception of self credibility and how receivers appraise oral information and decide what information to use and what to dismiss.

Chapter 6. The Second Interview Study

This subsection discussed study requirements that influenced study design. The next part of the section discusses specific aspects of the methods used to gather information in this study that were not used in the First Interview Study.

Study Recruitment

The organizational structure of AVH and its Leadership was not the same in 2007 when planning began for a second set of interviews as it was in 2005-2006 when the first set of interviews were conducted. In mid-summer of 2007, 69 Managers were included in an e-mail from the CEO's Executive Assistant to Annapolis Valley Health Leadership. Most recipients of this e-mail were either Directors or Managers (n=61), four were Vice Presidents and four were at the "Junior Leader" level.

The distribution list was examined and based on the researcher's knowledge of likelihood for information sharing activity; four groups of paid employees who worked only for the District were initially identified. Two of these groups were homogenous, with participants drawn from the same portfolio and two were heterogeneous, with members from different portfolios. The number of Senior Executive was limited, so two groups had one member at each of the Director and Manager level and two Junior Leader participants. Some Junior Leaders were recruited from outside the Leadership group.

A majority of participants in both interview studies were hybrid managers, including some at the Junior Leader level. Before analysis of First Interview Study data, the researcher was unaware of the characteristics of employees subsequently labelled Hybrid Manager and Junior Leader throughout this research. Two publications on hybrid managers had been identified (Detmer, 2000; Head, 1996) but the researcher was unable to find publications that focused on positions such as junior leaders. They are of interest to this research with respect to how they support organizational decision-making by accessing, managing and sharing information related to their subject areas.

There was no overlap between participants interviewed in the First Interview Study described in Chapter 4 and this Second Interview Study. Interviews were scheduled in two phases; the first thirteen interviews were held in March-April, 2008 and the final four interviews were conducted in November 2008.

Interview appointments were scheduled for forty-five minutes. These allowed thirty minutes for interviews and fifteen minutes to complete consents, the card sorting exercise and demographic questionnaires.

Data Saturation

The Second Interview Study was intended as a smaller study to explore specific issues raised but not well explained in the First Interview Study and the Calendar Study. The researcher estimated 12-15 interviews would be conducted. This study also used a critical incident technique with purposeful participant recruitment to allow for literal and theoretical replication with almost half of participants at the Junior Leader level. Again, there were minimal differences in responses to exploratory questions or in descriptions of meetings. After thirteen interviews, data were analyzed and then four more interviews were held to be certain that no new concepts or perspectives were likely to emerge. When no additional themes were suggested for further exploration, data collection was discontinued. Seventeen interviews were completed in the Second Interview Study.

Transcription

Second Interview Study tapes were transcribed verbatim into an MSWord^TM, 2007 form to create seventeen primary documents. These were maintained in their original state for the duration of the study and used to generate text files for data analysis.

6.3.2 Interview Procedures

The Interview Guide prepared for this Second Interview Study (Appendix C) included a description of the participant sample, the consent form, interview questions, interview procedures and general rules to be followed with respect to individual interviews, interview materials and interview equipment. This subsection begins by illustrating how research questions were translated into interview questions.

Interview Questions

The two sets of open-ended questions, critical incident and exploratory (Table 6-2) were asked in a conversational tone; participants were given freedom to interpret each in ways that were meaningful to them. The difference in approach used in the Second Interview Study was that the researcher focused on specific topics raised in the First Interview Study, rather than pursue a more exploratory line of inquiry.

Four research questions did not correspond directly with interview questions. The first of these, "Did Second Interview Study Participants use the same information as identified in the First Interview Study?" has been examined using responses to critical incident interview questions and the card-sorting exercise. The second question, "What is these participants' dominant information behaviour?" has been examined using responses to critical incident interview questions. The third question "What existing information behaviour models best represent the behaviours of these managers?" has been discussed in Chapter 7, which integrates the findings

from the First Interview Study and the Second Interview Study. The card sorting exercise was used to explore value assigned to information, as discussed in the next part of the section.

Research Questions	Critical Incident Interview Questions
Do healthcare services managers support decisions with just one type of information or do they use one or more different types of information?	Please tell me about a recent meeting you attended that went particularly well where information was shared to support an important decision.
Is there a consistent order of need with respect to information?	What information did the group consider that had an impact on the decision?
	What other information did members share that had an impact on the outcome?
	Probing Questions
Are these healthcare services managers challenged either by too much or too little information?	How would you describe the amount of information you typically have to support decisions? Would you say typically you have too much, too little or about the right amount? Can you comment on that?
What are the practices of these healthcare services managers in assessing oral information for credibility in group settings?	If you are uncertain about the accuracy of information being shared with a group, how do you generally approach that?
What is the role of meetings in these healthcare services managers' work?	Please tell me a little about your participation in meetings and your use of meetings information.

Table 6-2 Research questions and corresponding interview questions

Card Sorting Exercise

Methods to explore relevance, value and credibility were considered. Credibility would be addressed directly through exploratory questions. Established procedures for judging relevance of information using a scale (Maglaughlin and Sonnenwald, 2002; Schamber and Bateman,1996;) appeared to be more complex and time-consuming than this research would allow so relevance was not targeted for specific exploration in this Second Interview Study.

The third part of this Second Interview Study was a Card Sorting Exercise designed to assess whether there might be a consistent value assigned to different types and categories of information identified in the First Interview Study. Cards corresponded to each item of information mentioned as influencing decisions in the First Interview Study (Figure 4-3). "Opinion" was subdivided into public opinion (explicit information gathered through surveys and Community Health Board recommendations) and expert opinion (cultural information) to reflect the difference between them.

Seven items of information not named by First Interview Study participants were added from the Star Chart (Figure 3-2). These were identified in the literature and by the researcher as key sources of information for health service managers at the beginning of the study, but were not mentioned during critical incident discussion in the First Interview Study. The researcher wanted to explore whether or not these were important to health service managers. Information gaps

mentioned by First Interview Study participants were included only if they were also mentioned as information used or needed.

These 60 items of information were laid out in boxes using 44 point Arial font, eight to a white legal sized sheet and printed in black and white. They were cut as cards with a term on the front (Figure 6-1) and its definition on the back (Appendix F).

Figure 6-1 Information Components for the Card Sorting Exercise with 26 types of Explicit information from the First Interview Study (purple) and Star Chart (green), 24 types of cultural information (yellow) and 10 types of tacit information (orange)

Instructions to Participants

Participants were asked to think about the critical incident decision they had just described and consider whether, at the time when they were first thinking about the issue how they would likely feel about each information type if each were easily and equally available to them. They were asked to assign one of three possible values to the type of information on each card. These values were *need to know*, *nice to know* and *not essential*. The researcher used consistent phrasing with each participant; directions were also provided in writing (Figure 6-2) along with a sheet of paper with three boxes, each labelled with one of the three values.

I'd like you to continue to think about the issue we just discussed as if you had not yet dealt with it. I'm going to give you a set of 60 cards, each with a different type of information on it. Most of these were pieces of information that people in my first interview study said they were looking for when they made their decision. I added the other 8 myself from experience giving information and from the literature.

Could you please think of these with respect to the decision made at the meeting. Each of these is a type of information that has a bearing on your decision. It might support the decision you made, or if you had had it before finalizing the decision, lead you to consider reversing the decision. How necessary do you see each piece?

Please sort these into three piles. The first pile would be "need to know" information that would have had a significant impact on your group; the second pile would be "nice to know" information you would have liked to have had when you made the decision; but not having it would not have prevented the decision from being made. The third pile would be information that would not likely have made any impact on the outcome; group members would probably not have looked for it and if given it, would probably not bother with it.

Figure 6-2 Instructions for Card Sorting Exercise

When card sorting had been completed, the researcher stapled each set of cards to the box representing the value assigned to it.

Section Conclusion

This section described approaches used to gather data for the Second Interview Study that were different from First Interview Study approaches. The next section explains the methods used to analyze data and includes descriptions of different conceptual frameworks used in data analysis.

6.3.3 Data Analysis

Second Interview Study interview transcripts were indexed using Atlas.ti^TM with information and information behaviours indexed passage by passage and as series of information transactions. As a second step, information transactions in critical incident descriptions were mapped as described below. Meeting characteristics, critical incident characteristics and responses to exploratory questions were compared using cross-case analysis.

These analyses used some of the frameworks developed and used in the First Interview Study. As the researcher identified additional information types and information behaviours in the Second Interview Study, additions were made to these without further refinement. A new framework was outlined for *meeting purpose.* These approaches are also described in this section.

Analysis of Card Sorting Exercise Data

The participants' card sorting value choices were entered into a SharePoint List data entry form with one record for each participant. Fields included participant number, portfolio, position level and each type of information. Form radio buttons were used to select value choices (need to know, nice to know, not essential).

Card Sorting Exercise data were examined to determine frequency of value choices and to identify any relationships in values assigned by portfolios and position levels.

The SharePoint List could be examined using both Excel^TM 2007 and Access^TM 2007. MSAccess^TM was used to create a crosstab query to generate the frequency of values assigned to each type of information.

Analysis of Information Transaction Maps

The main units of analysis were information transactions. These have been defined in the computer science literature with respect to digital web transactions (Gatten, 2002) and referred to in the OR/MS literature (Huizing and Bouman, 2002; Saunders and Jones, 1990; Jones and McLeod, 1986) and LIS literature (Choo, 1993; Daft and Lengel, 1986) without definitions.

Proposed Definition for Information Transactions

The following working definition was created to facilitate information transaction mapping in this study:

> An *information transaction* consists of a specific input or a stimulus, one or more information behaviours, one or more items of information, and the information output or response. The *stimulus* was generally the identified information need that initiated the transaction. The *response* was the outcome of the information transaction.

The information transactions these participants described typically involved several items of information and at least one information behaviour. Most information in these transactions could be categorized as explicit, tacit or cultural, but some information was already mixed in "containers" such as meeting minutes or reports. Information behaviours at the centre of the transaction represented the group's action with respect to the information.

More commonly, the response in each transaction was the transaction end point, the point of information saturation or satisficing for that transaction. Some information transactions involved responses that became the stimulus for the next information transaction. For example, if the stimulus concerned a question about enough space for new equipment, and those present contributed information that satisfied everyone that there was enough space, the group would not need to continue discussion about enough equipment space. However, if the transaction end point identified enough space in a health centre 50 kilometres away, the response or outcome of that transaction might become the stimulus of the next transaction, which might relate to impact of travel distance on patients. This then might prompt those who knew about the subject (Wegner *et al.*1985, Wegner, 1986) to contribute what they believed would add value to the information already accumulated (Macdonald, 1998).

This working definition proved adequate for information transactions to be the unit of analysis in this exploration of participants' descriptions of what happened in meetings. It may be useful to other researchers who wish to explore information transactions.

Mapping Information Transactions

Passages indexed as information transactions within ATLAS.ti^{TM} were examined and mapped in three columns (Figure 6-3). The information *input/stimuli* – the specific issue that gave rise to the information behaviour and initiated the information transaction – was placed in Column 1; Column 2 contained both the information shared and the information behaviour associated with it; Column 3 was used to hold the *output/response* that terminated the information transaction and includes what happened specifically as a result of the information and information behaviour.
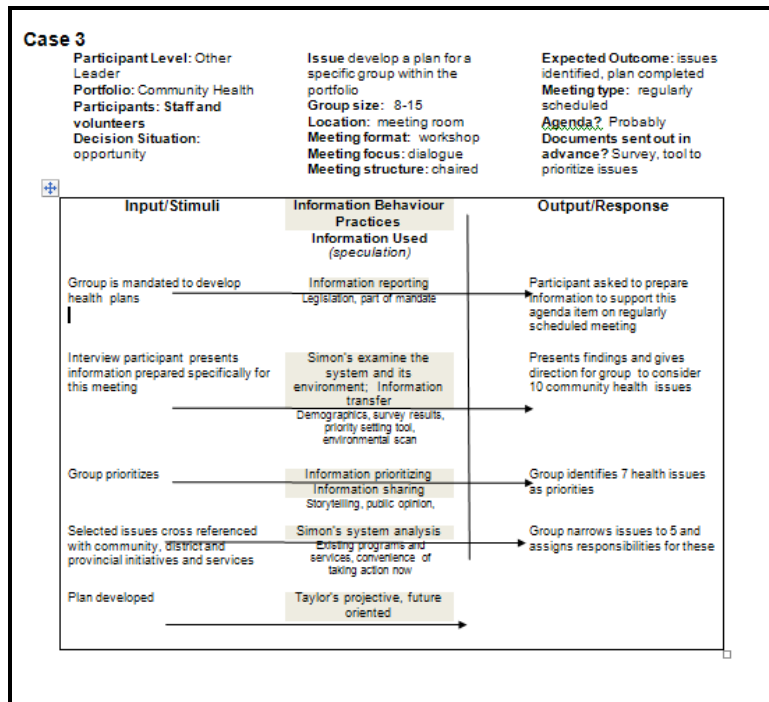
Figure 6-3 Example of Information Transaction Map

Once all information transactions were mapped, they were transferred from the map to a single MS Excel™ spreadsheet with one column for each transaction (Figure 6-4). Row headings included categories, subcategories and types of information and information behaviours in two alphabetical groups. Cells contained the counts for each information type or information behaviour for each transaction. These were summed for each participant as well as for all seventeen critical incident meetings. Colour was used to distinguish categories of information and behaviours for filtering, and to aid pattern identification.

Each information transaction was assigned a sequential transaction number that represented its place in the series of transactions included in the meeting description. For example, if a participant's description of an interview included nine transactions, the third transaction would be assigned three as a numerator and nine as a denominator (3/9). That number was converted to a percentage and placed in a quartile that indicated the relative ranking of transactions for that meeting: 1-25% was the first quartile, 26-50% the second, 51-75% the third, and 76-100% the fourth. This would allow information types and behaviours associated with them within single transactions to be examined and compared with matching pairs of information types and behaviours.

CATEGORY	SUBCATEGORY	TYPE			P1	P1	P1	P1	P1	P1	P1	P1	P1	P1	P1		P2	P2
			participant number		P1	P1	P1	P1	P1	P1	P1	P1	P1	P1	P1		P2	P2
			transaction number		1	2	3	4	5	6	7	8	9	10	11		12	18
			portfolio		AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	CH	CH
			position level		D	D	D	D	D	D	D	D	D	D	D	D	M	M
			number of transactions		11	11	11	11	11	11	11	11	11	11	11		8	8
			participant transaction number		1	2	3	4	5	6	7	8	9	10	11		1	2
			percent		9%	18%	27%	36%	45%	55%	64%	73%	82%	91%	100%		13%	25%
			quartile		1	1	2	2	2	3	3	3	4	4	4		1	1
new explicit	NEW		advertisements	1														
new explicit	NEW		best practices	1														
cultural	situational variables	Buy-in	Buy-in	2					1								1	
cultural	situational variables	Communication ease among partners	Communication ease among partners	2														
explicit	extras	Community organizations	Community organizations	2														
cultural	environmental variables	Conflict of interest	Conflict of interest	4														
cultural	environmental variables	Conflicting priorities	Conflicting priorities	8					1	1							2	
new explicit	NEW		content in popular magazin	2														
cultural	situational variables	Convenience of taking action now	Convenience of taking action now	2														

Figure 6-4 Example of a mapped interview with information and information behaviour tabulated for each information transaction.

To help the reader visualize individual information transactions for one meeting, a meeting with 11 information transactions has been shown in Figure 6-5. Each column represents a transaction, in which the information has been shown in pink and the information behaviours in blue. The participant number appears in the top row, the transaction number appears in the second row and the meeting quartile with respect to number of information transactions appears in the third row.

Participant number	P1	P1	P1	P1	P1	P1	P1	P1	P1	P1	P1
Transaction number	1	2	3	4	5	6	7	8	9	10	11
Quartile	1st	1st	2nd	2nd	2nd	3rd	3rd	3rd	4th	4th	4th
	Legislation	Understanding other departments	Knowledge, experience with process	Buy-in	Conflicting priorities	Related decisions made	Experience	Knowledge, experience with process	Meeting records	Understanding other departments	Experience
	Safety	Problem Understanding,	Reporting	Conflicting priorities	Quantity of work involved	Information Searching	Expertise	Reporting	Strategic Sharing	Information Gathering through visits	Expertise
	Information Transfer			Imposed deadlines	Directive Sharing	Reporting	Likelihood of a good solution/ outcome				Organizational/ supervisor support
				Organizational expectations		Strategic Sharing	Related decisions made				Information Seeking - Ask an Expert
				Physical resources			Information Referral				
				Task importance							
				Information Gathering							

Figure 6-5 Example of Information Transactions from a single interview showing Participant number, Transaction Number, Quartile and 11 information transactions; information with a pink cell background and information behaviours with blue.

Information transactions were examined to see whether specific types of information tend to be associated with certain information behaviours or with patterns of co-existing information and information behaviours. They were also considered with respect to whether particular information tended to be used earlier in the meeting before other information, or later, after other information.

6.3.4 Thematic Frameworks Developed for the Second Interview Study

Participants' descriptions of critical incident meetings were classified by meeting purpose, group size, and group heterogeneity. Passages were also indexed to support cross case analysis related to whether meeting participants were managers only or whether staff and external members were included, decision complexity, managers' decisional roles, and participants' time spent in meetings.

Meeting Purpose

Interviews began with Second Interview Study participants being invited to characterise a recent critical meeting with a statement that captured a single purpose for that meeting (e.g. to respond to an emergency, to consider a government regulation, to inform a process). In addition to the stated purpose for the meeting, interviews included further descriptions of different outcomes and activities at that meeting.

Advise/Recommend	Identify key stakeholders
Appraise information	Identify solutions
Approve/Accept information	Identify successes
Build teams	Information synthesis
Delegate work	Innovate, change processes
Develop standards & guidelines	Inspect a fixed object
Discuss aspects of education/training/professional development for staff	Make decisions
Discuss aspects of peer education	Negotiate
Discuss ideas	Outline essential information
Discuss what worked somewhere else	Plan
Ensure that everyone understands	Present report
Establish common ground	Reconcile conflict
Gain support	Reorganize
Get consensus	Review Product/Process
Get everybody on the same page	Review status / Identify issues

Table 6-3 Terms used to index interviews by meeting purpose

To increase the researcher's understanding of what happens at meetings, a list of 36 terms to describe meeting purpose was generated from several articles (Romano and Nunamaker, 2001; Panko and Kinney, 1995; Panko, 1992) and used to code participants' descriptions of critical incident meeting outcomes retrospectively (Table 6-3). These terms were derived from work by two researchers so there was variation in how the same concept was described. Consequently,

some amalgamation was required. No effort was made to identify related or broader and narrower terms or to further develop a thematic or conceptual framework for use beyond this study.

Information

Information shared at the meeting was categorized by Choo's three types of explicit, tacit and cultural knowledge (Choo, 2006). Following data analysis, the framework used to classify information included 94 terms: 48 explicit, 26 cultural and, 19 tacit. These included the 60 types of information used in the Card Sorting Exercise (Figure 6-1) and 34 new types, added as identified during indexing. Six new information gaps were identified.

Information Behaviours

Information behaviours were categorized using terms identified from the literature review (Lu, 2007; MacKenzie, 2003b; MacKenzie, 2003a; Bates, 2002; Sandstrom, 1999; Saunders and Jones 1990, Jones and McLeod 1986) and from First Interview Study data analysis. These were enhanced with terms from research discussed in the literature review on information sharing (Savolainen, 2008; Bao and Bouthillier, 2007; Talja, 2002; Clarke, 1973), absorptive capacity (Belkhodja *et al. 2*007; Caccia-Bava, 2006; Cohen and Levinthal,1990) collaborative information behaviour (Talja and Hansen, 2006; Talja, 2002), information transfer (Belkin, 1984) knowledge translation (Dobbins, 2007; Landry, 2006; Schamber and Bateman,1996, Daft *et al. 1*987) and knowledge transfer (Rundall *et al. 2*007, Browman *et al. 2*003b, Lavis *et al. 2*003), information interactions at meetings (Huvila and Widen-Wulff, 2006; Cool and BelkIn 2002), information richness (Robert and Dennis, 2005; Kahai and Cooper, 2003; Daft and Lengel, 1986), the ability of information to change understanding within a time interval (Daft and Lengel, 1986) and teamwork and group collaboration (Nijhuis *et al. 2*007; Hutchins *et al. 2*007).

Information behaviour terms were grouped within five main headings to create a framework for data analysis for this study. These were: identifying information needs, using information, seeking information, sharing information and managing information.

6.4 Study Results – Description of Sample

As indicated in Section 6.2, the general aim of this Second Interview Study was to develop a better understanding of the information behaviour of health service managers as identified in the First Interview Study. Specific issues were explored further using critical incident questions, exploratory questions, a card sorting exercise and a demographic questionnaire. The findings from these methods are presented in two sections. Characteristics of the interviews, participants, meetings and groups are presented first in this Section, followed by study findings organized by a thematic diagram in the next Section.

6.4.1 Response Rate

Interviews were scheduled in two phases. The first series of thirteen interviews were held in March-April, 2008 and the final series of four interviews were conducted in November 2008. Only one of the health service managers asked to participate did not reply. That individual had recently joined the organization, and left several weeks later. That vacancy in the first series of interviews was filled by two participants from the same portfolio in the second series of interviews. Two managers who agreed to be interviewed in March 2008 but were unable to schedule an interview at that time were included in the second series.

6.4.2 Interview characteristics

Response word count ranged from 1,456 to 5,857 words. The mean word count was 3,435 words; the median was 3,645 words.

6.4.3 Participant Characteristics

This subsection presents demographic characteristics for participants and details of their participation in meetings. Table 6-4 shows numbers of study participants by position level and portfolio.

Portfolio	Position Level	Number of Participants
Senior Executive	CEO or VP	2
Acute Care	Director	2
Administration	Director	1
Community Health	Manager	2
Acute Care	Manager	1
Operations	Manager	1
Administration	Junior Leader	1
Acute Care	Junior Leader	1
Community Health	Junior Leader*	5
Operations	Junior Leader	1
		17

Table 6-4 Interview Participants' position level and portfolio
*Junior Leaders were interviewed who were not members of the Leadership forum.

There were two groups from the Community Health portfolio – one homogenous and one heterogeneous with respect to their workplace with two members being hospital based and two

community-based.   There was one homogenous group of Administration staff and one heterogeneous group with members from Acute Care and Operations.

Demographic Characteristics

Nine of the seventeen participants were female, over fifty years old with professional qualifications, at least 1 university degree and more than twenty-five years of health services experience (Table 6-5). Thirteen of the managers in this study were hybrid managers, i.e. health professionals who became managers (Head, 1996; Detmer, 2000) and the remainder were career managers who entered healthcare services with health administration, engineering or other education.

Variable	Category	n
Gender	Female	13
	Male	4
Age range	25-34	3
	35-44	1
	45-54	7
	55-64	5
	not disclosed	1
Organizational Level	Senior Executive	2
	Director	3
	Manager	4
	Junior Leader	8
Portfolio	Acute Care	3
	Community Health	8
	Operations	2
	Administration	4
Education	Undergraduate Degree	8
	Graduate Degree	6
	Other post-secondary education	3
	Professional Qualifications	12
	No Professional Qualifications	5
Healthcare Career Years	0-4	4
	5-14	1
	15-19	1
	20-24	0
	25-29	2
	30-34	7
	35-39	1
	not disclosed	1

Table 6-5 Participant Demographic Characteristics

6.4.4 Critical Incident Characteristics

Critical incident situations were explored for decision complexity and managerial roles, as previously defined in the Literature Review and discussed in Chapter 4. Participants described discussion of single critical incident issues, but not all meetings were called just to discuss critical incident issues. All participants described situations where decisions were *unstructured,* new situations not encountered before (Table 6-6). Several situations were described as crises and the rest were split between problem or opportunity situations or involved both. All three types of policy decisions were represented and most meetings involved establishing policies and procedures to some degree. A majority of the meetings these managers chose to discuss involved operational decisions, expected to be immediate impact, short term, short range, usually low cost and "made with little thought" (Harris, 2009; Harris, 1998).

Decision Structure	
Unstructured	17
Structured	0
Decision Situation	
Crisis	4
Problem	5
Opportunity	5
Problem, opportunity	3
Decision Level	
Operational	13
Strategic	0
Tactical	3
Operational, Strategic, Tactical	1
Policy type discussed or addressed at meeting	
Public Policy	3
Clinical Policy	3
Administrative Policy	9
Clinical & Administrative Policy	2
Policy action at meeting	
Establishing policy	4
Operationalizing policy (figuring out what to do)	5
Establishing procedures (deciding how to do it)	2
Establishing policy & establishing procedures	2
Establishing policy & operationalizing policy	4

Table 6-6 Complexity of Second Interview Study "Single-Meeting" Critical Incidents

Each group's activities at meetings were easily classified by one or more managers' decisional roles as described by Mintzberg (1973) and Hales (1993). As shown in Table 6-7, the dominant category was decisional; planning was the most common managerial activity.

Managerial Roles								
Mintzberg (1973)							Hales (1973)	
Decisional roles		Informational roles		Interpersonal roles				
Allocating money, materials, and personnel.	4	Monitoring	1	Leader/Figurehead	0		Planning	15
Negotiating within and on behalf	6	Disseminating	1	Forming contacts and liaising with others.	6		Supervising Staff	2
Handling Problems, Disturbances, Disruptions	7	Spokesman	0					
Innovation - new methods and processes	9							
Totals	25		2		6			17

Table 6-7 Managerial Roles in Second Interview Study Critical Incidents

6.5 Study Results – Research Findings

Analysis of interview data for this follow-up study generated one core category, 'Information and Sharing', and four main themes, "Information and Meetings", "Information and Transactions", "Information and Quantity" and "Information and Appraisal". These themes are presented diagrammatically in Figure 6-6 and used to organize study findings.
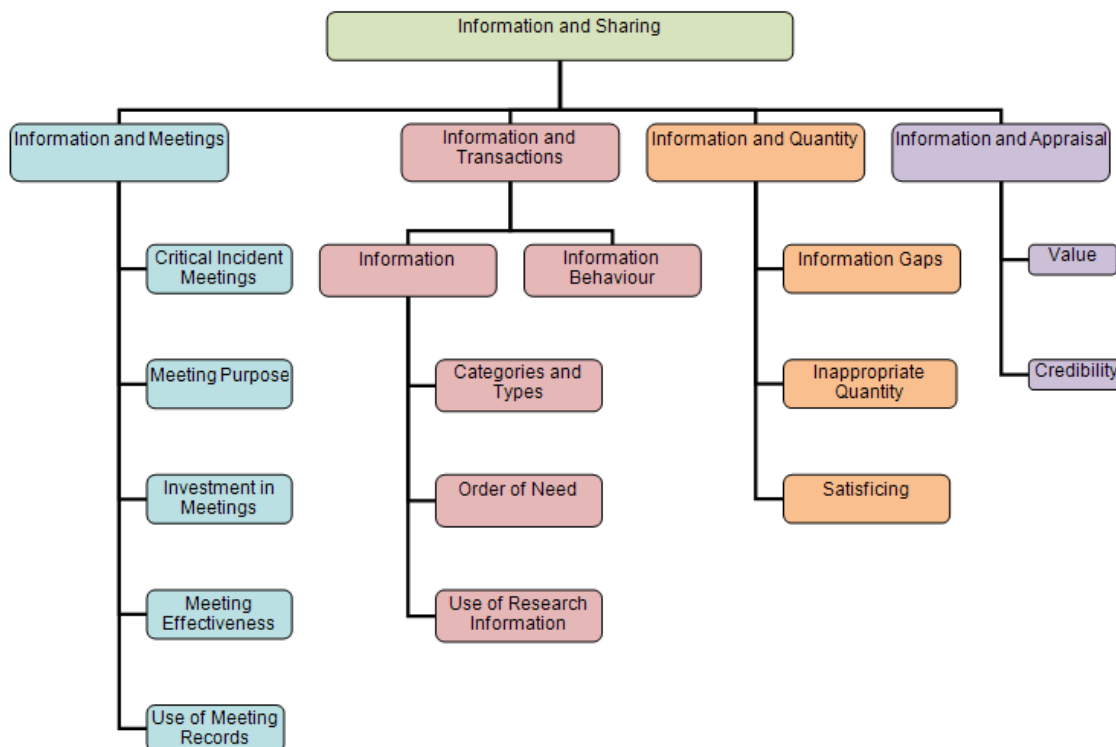
Figure 6-6 Thematic Diagram for the Second Interview Study

The Information and Transactions theme was informed only by participants' descriptions of what took place in the meetings they described. The Information and Meetings and the Information

and Quantity themes have been based on both critical incident discussion and response to exploratory questions. The Information and Appraisal theme is based on interview questions and the card sorting exercise.

6.5.1 Information and Meetings Theme

One of the study's research questions inquires as to the role of meetings in these participants' work. The calendar analysis provided a general impression about scheduled health services meetings. However, it did not provide the level of detail necessary to understand very much about the purpose of the meetings or the groups' activities or the impact of meetings on participants. It examined only scheduled meetings in the District's 20 large meeting rooms and could not include information on other scheduled meetings in offices, departmental meeting rooms or using telecommunications utilities, or on unscheduled meetings in offices, hallways or elsewhere.

Second Interview Study participants were asked to describe a recent, particularly effective meeting in which information was shared to inform a group decision made in that single meeting. All were able to do this except for one. That one participant chose to describe a particularly ineffective decision made over a series of scheduled and unscheduled meetings.

Participants were also asked exploratory questions related to the role of meetings in their work. This theme explores the role of meetings in workplace information sharing. It begins with a summary of results related to the critical incident meetings.

Critical Incident Meetings

This part of the section describes these meetings where participants and others made group decisions about critical issues. Dimensions identified in the literature review as appropriate for typical organizational meetings (Romano and Nunamaker, 2001; Panko and Kinney, 1995; Panko, 1992) listed at the top of each meeting map (Figure 6-3) and have been summarized in Tables 6-8 and 6-9 below.

Most meetings related singly to the critical incident issue; four were regularly scheduled meetings of formally structured groups. No critical incident meeting was a subcommittee of a larger committee. Table 6-8 presents some of the meetings' physical dimensions including location, meeting recurrence, meeting recurrence and geographic scope of the critical incident issue.

Location	Number
One of 20 large meeting rooms	10
Departmental meeting room	4
Office	1
Hallways, phone	1
Hallway and one of 20 large meeting rooms	1
Meeting Recurrence	**Number**
Informal small group meeting	5
Regularly scheduled meetings	4
Special meeting of group that meets regularly	8
Subcommittee of group that meets regularly	0
Number of Issues on the Agenda	**Number**
Meeting to discuss a single issue	13
Meeting to discuss multiple issues	4
Geographics	**Number**
District-wide Issue	12
Single site issue	5

Table 6-8 'Physical' Details of Critical Incident Meetings

	Characteristics			Participants								
Meeting	Participant's Portfolio	heterogenity	# present	CEO and VPs	Directors	Managers	Other Leaders	Staff	Board	External Partners	Contractors	Community Reps
1	Acute Care	≥2 portfolios	16-30		x	x						
2	Community Health	1 portfolio	2	x		x						
3	Community Health	1 portfolio	8-15			x	x	x	x			
4	Operations	1 portfolio	3-7	x	x	x					x	
5	Community Health	1 portfolio	8-15		x	x	x					
6	Community Health	1 portfolio	8-15			x		x				
7	Operations	≥2 portfolios	16-30		x	x	x				x	
8	Community Health	1 portfolio	8-15	x	x	x	x					
9	Acute Care	1 portfolio	8-15		x	x						
10	Community Health	≥2 portfolios	16-30			x	x	x				
11	Administration	1 portfolio	3-7	x	x							
12	Acute Care	1 portfolio	8-15				x	x				
13	Community Health	1 portfolio	3-7				x			x		
14	Acute Care	≥2 portfolios	8-15	x			x					x
15	Administration	1 portfolio	8-15	x	x							
16	Acute Care	1 portfolio	8-15		x	x						
17	Acute Care	1 portfolio	8-15		x	x						

Table 6-9 Group Characteristics of Critical Incident Meetings

Table 6-9 presents characteristics of the groups described including participant's portfolio, group size, group heterogeneity with respect to portfolio, and organizational chart level represented at the meeting.

Most meetings were homogenous with respect to portfolio, but included a mix of participants at different position levels, most with different departments represented. Participants at the Manager level attended 11 of 17 meetings described, Directors attended 10 of 17 and Junior Leaders attended 8 of 17 (Table 6-9). Of the seventeen meetings, three were attended only by Directors and Managers (meetings 1, 16 and 17) and two attended only by Senior Executive, including the CEO, VPs and three Directors (11 and 15).

Meeting Purpose

Meeting purpose was examined in three ways: 1) generally, from participants' initial statements as to the primary reason for their critical incident meeting, and 2) in depth, from participants' descriptions of activities at critical incident meetings and 3) through exploratory questions about meeting purpose generally and the purpose of scheduled meetings of informal small groups.

Critical Incident Meeting Purpose

At the beginning of their interviews, Second Interview Study participants characterised a single purpose for their critical incident meeting, as shown in the following three examples.

> *… the purpose of the meeting was to bring everybody together to hear exactly what all the issues were across the district so that we had the big picture because there were more impacts bigger than each of the units are struggling but some are struggling more and in different ways and we didn't all have the information. (Participant Group 2-A)*

> *The meeting was about a provincial initiative that is being coming from the DoH so there is a fair bit of pressure to enact something. (Participant Group 2-C)*

> *[The meeting was about] the [crisis] because that is what I have been involved for the last almost two months now. The initial meeting was convened shortly after the event happened. (Participant Group 2-D).*

These and other parts of participants' descriptions of expected outcomes of the critical incident meetings were indexed with terms representing meeting purpose identified in the literature and listed in Table 6-3. Terms used in indexing for meeting purpose have been listed by frequency of use in Table 6-10.

Meeting Purpose	# times used to index	Meeting Purpose	# times used to index
Plan	16	Discuss any aspect of peer education	3
Innovate/change processes	13	Identify solutions	3
Review status / Identify issues	13	Synthesize information	3
Solve problems	12	Present report	3
Discuss any aspect of education/ training/professional development for staff	11	Advise/Recommend	2
Identify challenges	10	Develop standards & guidelines	2
Identify goals and objectives	8	Inspect a fixed object	2
Get everybody on the same page	7	Reconcile conflict	2
Identify key stakeholders	7	Reorganize	2
Build teams	6	Appraise information	1
Discuss ideas	6	Get consensus	1
Review Product/Process	6	Handle emergencies	1
Approve/Accept information	5	Identify successes	1
Discuss what worked somewhere else	5	Make decisions	1
Ensure that everyone understands	5	Negotiate	1
Delegate work	4	Outline essential information (SBAR, PREP)	1
Establish common ground	4	Share resources	1

Table 6-10 Meeting purpose terms assigned from most to least frequent
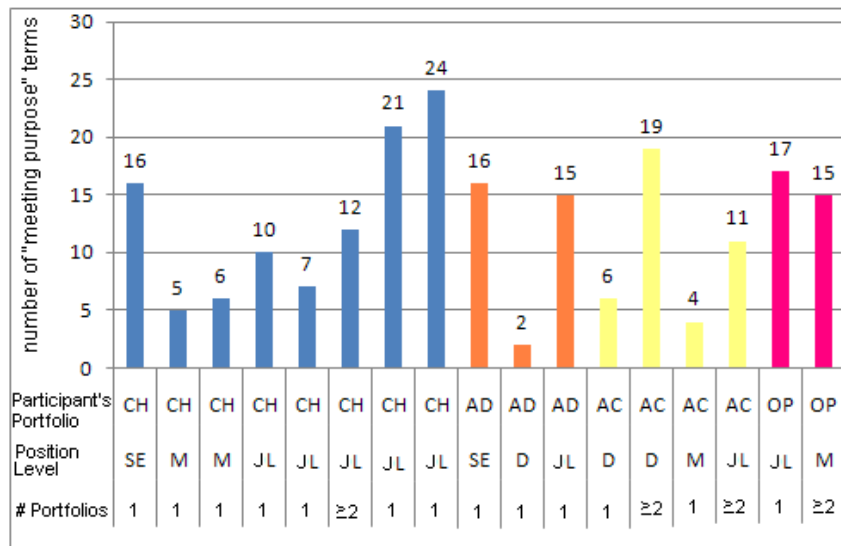
Figure 6-7 Critical Incident Meetings characterized by the number of "meeting purpose" terms used to index descriptions, participants' portfolio, position level and group homogeneity.

Each meeting was indexed with between two and 24 terms that characterize meeting purpose (Figure 6-7) suggesting the degree of complexity in these meetings beyond the stated meeting purpose. Participants' comments to exploratory questions about the purpose of meetings are summarized in the next part of this section.

Purpose of Meetings in General

This part of the section begins with a discussion about the purpose of meetings in general and then focuses on the purpose of scheduled small group meetings.

The following three comments illustrate how meetings serve the organization. The participant who made the first comment summed up meeting purpose from the perspective of a participant at a junior leader level. The second and third comments are from a single participant at a more senior level on the organization chart. These reflect the need for meetings in a democratic organization, as well as to avoid duplication of effort in an organization where work done at one level may be passed upward through the hierarchy for approval by different individuals or groups.

> *[The purpose of meetings include] planning and solving problems, resource sharing and training… (Participant Group 1-C)*

> *We have a lot of conversations in the organization and people say they don't want to go to meetings and what I say to people is that "if you don't want to go to meetings then it is an autocratic situation …somebody gets to make the decision and you have to be prepared to live with that". (Participant Group 4-B)*

> *…so in this organization we are very careful not to double guess, so when something come from for instance … the administrative policy and procedure committee, we are looking at the process, somebody is already there looking at the content so unless there is something very glaring we are stamping approval because the whole process and the content has already been dealt with. (Participant Group 4-B)*

The next two quotations are examples of participants who described meetings as useful when different perspectives and skills are needed.

> *Meetings are when you need to bring a group that has the combined expertise required to do the job. (Participant Group 4-B)*

> *[we meet when a particular job can't be done]… I can't do it myself, it is a [job for the] whole institution including doctors and outpatient nurses and so on … (Participant Group 1-C)*

Participants commented generally that meeting purpose was not always clear, as in the following two quotations.

> *I think meetings are necessary but there are a lot of unnecessary ones… there was a commercial on TV a couple of years ago, there was a bunch of people sitting around a meeting and everybody was looking at everybody else and said who called this meeting and nobody called it and they all got up and left and I feel that way sometimes, it is just like "why are we here?" (Participant Group 2-D)*

> *I find a lot of times … I have talked to a lot of other people and asked them …"so what is the objective and why were we around the table?" and a lot of times …it is sort of information*

> *sharing, it may be a bit of like networking, it is not clear what we met for. (Participant Group 1-B)*

Another participant described invitations to meetings as an indicator of a position's relevance and commented on the value of meetings as multi-purpose networking opportunities.

> *…if you are in there you are "in the fold" [if] absent, you are often left out and excluded. So in order to be part of [things] you have to be there, even if you don't have anything to contribute. Otherwise you start to become almost obsolete because you are not needed, not valued, because you are not visible. (Participant Group 1-B)*

> *… often you are trying to grab the networking opportunities …you think, "I will get a chance to see so and so there", …"maybe the meeting is not relevant but I do need to talk to them about something else and I will get to see her" … sometimes we meet for the sake of meeting to bring people together.. Really what we are trying to do is build working relationships… really we just want certain people to be in the room interacting with each other (Participant Group 1-B)*

Purpose of Small Group Meetings

Participants were given a description of the Calendar Study finding about small group meetings and asked whether they had similar meetings. If they answered positively they were asked about the purpose and frequency of such meetings. Two participants said they did have small informal meetings but these were less frequent than formal large group meetings.

> *… the majority of them would be regularly scheduled meetings …[less frequently there might be] impromptu return to work meetings that we have with HR … and then there are the site things that come up with maintenance, around plant or site issues that pertain to your department… (Participant Group 2-A)*

> *There would be crises … where meetings are called together quickly but … most of my meetings would be regular. (Participant Group 4-B)*

Other participants said they engaged in small informal group meetings as least as frequently as meetings of formally structured committees.

> *Probably more numerous than regularly scheduled meetings, probably a function of the role that I have. (Participant Group 3-B)*

> *Yes, definitely. Either teleconference calls in one of our offices with us and a couple of other people … [for] …Decision-making usually, and/or planning. (Participant Group 1-C)*

> *I have … meetings with each of my direct reports once a month. And we have updates … I don't believe in having people write reports when you can spend 25 or 30 in an update… [their purpose is] project driven for the most part …(Participant Group 4-B)*

A common description of these small group was that they were working meetings where several people met to identify or work through issues or parts of issues. Subsequently, discussions or work would be shared with a larger group. No participant explained how members were chosen for these meetings; transactive memory may play a role in that each manager is expected to maintain knowledge and expertise in a certain area as well as awareness of what the other managers know (Lewis, 2003).

> *usually the ones that are like that for me … are one issue specific and usually come out of … … a small offshoot piece of [committee] work that needs to be done by a smaller group rather than the whole group … Others [might be] something that a couple of us recognize [as] a need to do something around … we might have several smaller meetings … [then see] what does the larger group say … others would be small groups checking in …meeting on long term ongoing projects [where] meetings don't happen regularly [just] 2 or 3 times a year. (Participant Group 1-A)*

> *…there is quite a bit of that …the meetings are subcommittees …making decisions … information sharing is often part of strategic planning. And then there are other meetings where we are looking at how to deal with a large volume of information that is unmanageable. (Participant Group 1-C)*

> *…working groups that have evolved [from a] need for individuals to take away pieces of work in smaller groups…(Participant Group 4-B)*

These comments suggest that small group meetings are common and that they occur for different reasons, including identifying and addressing information needs around a potential decision situation or completing tasks for a larger committee. No participant mentioned booking a larger room to allow more space to spread out work. Participants described having these scheduled small group meetings more often in offices or by telephone than in large meeting rooms.

Investment in Meetings

Participants were asked how much of their time at work was spent in meetings and with how many groups they met regularly.   Responses extracted from interview transcripts are presented and discussed in this part of the section.

Participants' responses to exploratory questions about what percentage of work time they spent in meetings and their participation in groups that meet regularly were examined by position level and portfolio with time spent in meetings grouped in 20% increments (Table 6-11).

The five participants who said they spent 81%-100% of their time in meetings were from all four portfolios at the Junior Leader, Director and Senior Executive levels.   No Manager reported spending this amount of time in meetings, but there was nothing to suggest that others in the organization at the Manager level did not meet more or less frequently than the Managers interviewed.

Portfolio	Position Level	% work time in meetings	# membership in different groups
Acute Care	Director	81-100%	-
Acute Care	Director	21-40%	16-20
Acute Care	Manager	21-40%	11-15
Administration	Senior Executive	61-80%	6-10
Administration	Director	81-100%	16-20
Administration	Junior Leader	61-80%	-
Administration	Junior Leader	41-60%	6-10
Community Health	Senior Executive	81-100%	11-15
Community Health	Manager	61-80%	6-10
Community Health	Manager	41-60%	11-15
Community Health	Junior Leader	81-100%	6-10
Community Health	Junior Leader	61-80%	11-15
Community Health	Junior Leader	61-80%	6-10
Community Health	Junior Leader	21-40%	11-15
Community Health	Junior Leader	0-20%	0-5
Operations	Manager	-	6-10
Operations	Junior Leader	81-100%	-

Table 6-11 Participants' self-report of time spent in meetings and their regular participation in meetings of named groups. Missing values are represented by "-"

There did not appear to be any other relationships between portfolio or position level and time spent in meetings. Of the two Acute Care Directors interviewed, one spent 81-100% of work time in meetings and the other spent 21-40%. Four participants from the Community Health portfolio at the Junior Leader level were interviewed. Ranges for the percentage of time spent in meetings fell within bands from 21-40% to 81-100%. Further, there did not appear to be a relationship between time spent in meetings and the number of memberships in different groups. When asked about the number of groups they met with regularly, the three participants who spent at least 80% of their work time in meetings responded with different number ranges. One of these participants met regularly with 6-10 groups, another met with 11-15 groups and the third with 16-20 groups. The Junior Leader who spent the most work time in scheduled meetings met with 6-10 groups regularly while the Junior Leader who spent the least amount of work time in scheduled meetings met with 11-15 groups regularly.

Meeting Effectiveness

As the last interview question, when invited to comment on anything about information sharing they thought to be important but that had not been addressed, some participants took the opportunity to comment further on meetings. The following two quotations note the importance of meetings.

> *I value meetings more today than I did five years ago …work is different now and so my needs [have changed]… so …meetings have a greater value for me (Participant Group 2-C)*

> *Again it depends on the group, some I find very useful and beneficial and positive and progressive. In [formally named group] you know, we usually move forward -it is a great group. And [another formally named group] has been a great group. So there are groups that are better and there are some, I think, people meet just because they have been meeting and maybe it is not the best use of people's time. (Participant Group 2-A)*

Some participants pointed out that being expected to attend so many meetings placed a burden on them with respect to time out of their offices and departments, as in the following three quotations.

> *I think they are necessary, it is hard when you have work to do to take the time sometime to [go] (Participant Group 1-C)*

> *… 60-75% of my time is meetings, and somewhere there I am supposed to get some work in and continually feel that I am failing because I can't produce what people want from me because I am in meetings. (Participant Group 1-B)*

> *I think they are a necessary evil. I think that sometimes I find I get quite impatient at meetings at times when I am overwhelmed with tasks that need to be completed. (Participant Group 2-C)*

> *I have a little sign that says "Please God, not another meeting". Some days, sometimes there are too many, they get in the way of other work that has to be done, work doesn't go away …I don't always find that … they are productive in the sense that we move issues forward or we come to resolutions or we are progressive.   I don't find it that helpful. (Participant Group 2-A)*

Other participants described meeting outcomes in terms of untenable workloads for them, as suggested in the next three quotations.

> *... you come away … overwhelmed every time. It is the same with [formally named group] meeting I come out with a stack of work. Every meeting that I go to I come out with work. And it gets pretty frustrating because you can't do it. There is only one of me and when you have 5 or 6 people that want you to do things and then you start multiplying that by everything else that is going on I think that is why I dislike meetings so much – it generates a whole lot of work. (Participant Group 2-D)*

> *…when you come to meetings you don't contribute and there still is a fair bit of "don't make eye contact" because if you make eye contact at a meeting you come out of it with a fair bit of work. (Participant Group 1-B)*

> *…Now we say we really need to think about [named workplace issue], that immediately means meetings, right?   Now that is a priority because … it is in our progressive excellence plan … but we need to look at it and say "but when is it a priority?" because everything can't be [the priority]. (Participant Group 1-B)*

Chapter 6. The Second Interview Study

Some participants' comments indicate that some meetings took place without mandates or meeting rules about meeting length, purpose, or outcome expectations.

> *The [formally named group] meeting has been difficult, I was there, I left and I came back and we haven't gotten any further than when I was there a year ago. …we meet but the [formally named group] is a little wishy-washy so the last meeting we were … going to look at direction again to figure out what we are doing and why we are doing it. (Participant Group 1-C)*

> *I've worked with a group recently and we have had our struggles… there were gaps in trust, "what is this about?", "why have they got us here?", "what are they trying to accomplish?" (Participant Group 1-B)*

> *I just find we don't run them as efficiently as we could …we have people who are so busy, they have so many things [to do] we really do need to run them as efficiently as we can. (Participant Group 1-C)*

> *I have been at very effective meetings, ineffective meetings … there is a wide range of productivity … it might be that the information discussed was pretty dry or drab so [despite] the importance of the meeting, you drift off… those that look at fundamental [meeting] principles work better: start and end on time, respect others, allow questions to come forward … (Participant Group 3-A)*

> *.. in terms of organizational effectiveness …we got to do something different…we get stuck … we keep meeting and meeting and meeting … it is not managed in the way that we move forward. (Participant Group 1-B)*

One participant commented on the need for leaders to maintain a positive outlook in meetings to maintain employee morale.

> *I believe that is important …we work in a stressful environment and if I come to work stressed and tired then I am sending that message to this whole building because when I sit in a room with people they look at me and they watch, right, to see how I feel – if I am stressed they all feel that, right. And if I think "there is no solution" then they feel it is hopeless… (Participant Group 3-A)*

Understanding other departments was a noteworthy information gap in the first Information Study and was, as will be discussed below, one of the most needed and used types of information in this Second Interview Study. However, some participants did not consider management meetings designed to share information an effective use of time. As illustrated by the two following quotations, one participant decided simply not to attend meetings while the other had no choice.

> *.. are a waste of time if there is something to do that I can do about it, I mean, it is done. But if I have to read a whole bunch of flack that has nothing to do with me, I just don't. … How can you do that and do your job? … I tune …out …don't take part in a lot of stuff just for that reason. They would have you going 24-7 if you let it so I choose not to. (Participant Group 2-D)*

> *… people say "well, you are supposed to be collaborative" so how do I say "no"? . .. if [I] don't go I won't be able to make a contribution and I think it is important [that my] perspective is represented …So when I have said "we're being meetinged to death, can you cut any of those out" well no, because who will represent my world, … which is different (Participant Group 1-B)*

Other comments identified two specific areas for improvement in meeting practices. The first was clarity with respect to participants' roles and assigned levels of decision-making. The second was advance awareness of the expected meeting outcome.

> *I hate meetings because some of them seem to waste time …I always felt they weren't effective, they took too long to get anything done. A lot of meetings people want to go away and consider what they talked about and no result comes out of it. I don't like that – I'd rather "we are going to leave this meeting with decision". We might have to modify it but you are going to have some sort of direction out of it. (Participant Group 1-D)*

> *..it is really important when you go to that meeting that you have the ability to contribute to decision-making … …[attending with] no decision-making ability… is really a waste of time. And I have heard other partners refer to it as "you need to have some currency within your organization". (Participant Group 1-C)*

> *From any meetings there needs to be some sort of outcome. I have time for perhaps one conversation where I can say "so it's ok that there wasn't an outcome for that particular time, the next time … I'd expect to have some outcome." …. (Participant Group 3-B)*

The following two quotations suggested that a project management approach might make meetings more effective and that groups be given mandates tied directly to health service plans at some level.

> *A lot of times we are at meetings [without] clear expectations… Do we do terms of reference or not … some groups that will take several meetings … talking about terms of reference … you want to just jump off a tall building – whoops! … [what if we used project management] when you bring a project team together, you define it to some extent … before you bring [people] together. (Participant Group 1-B)*

> *…We meet when the idea occurs to us, or something comes up as opposed to saying "If we have a plan, a strategic plan then we have an operational plan for the program or services, then we are saying these are the things we are going to do, these are the priorities for this program and there is all the day to day stuff." … Then if something else comes up we say "that is over here, we will meet about that in the next quarter." (Participant Group 1-B)*

Comments from participants in all portfolios and at Junior Leader, Manager and Director levels indicated that meetings must be made more effective, with clearer roles and guidelines for more efficient processes.

Use of Meeting Records

As one of the exploratory questions, participants were asked about their use of written meeting records.

Some noted that meeting minutes were not usually distributed until at, or just before, the next meeting. Others reviewed only the minutes of meetings they chaired. Most who did read meeting minutes skimmed them as they walked to the meeting. Participants took their own notes in both informal, single issue meetings and meetings of named groups. Some made their own notes on only their own actions to complete before the next meeting. One participant made notes on his own action items and to refresh the group's memory, shared these notes before he reported on

his action items. No other participant who took their own meeting notes reported sharing them with others in the group.

Participants also reported having little time to review material sent out in advance of meetings. One said that rather than sending documents out in advance, she found it best to highlight main points of documents at the beginning of meetings. Few participants used meeting records after the meeting for any purpose, either as a record of the group's activities or to understand why and how decisions were made or to review decisions with respect to whether they might be written as policy.

Portfolio	Position Level	Do they read meeting minutes?	Do they take their own minutes at meetings?
Acute Care	Director	Sometimes	-
Acute Care	Director	For groups chaired	For own action items
Acute Care	Manager	For groups chaired	-
Administration	Senior Executive	Always	-
Administration	Director	Yes	Yes
Administration	Junior Leader	No	
Administration	Junior Leader	Always	Yes
Community Health	Senior Executive	Sometimes	-
Community Health	Manager	Rarely	-
Community Health	Manager	Yes	-
Community Health	Junior Leader	Yes	-
Community Health	Junior Leader	Yes	Yes
Community Health	Junior Leader	Yes	-
Community Health	Junior Leader	Often	-
Community Health	Junior Leader	Rarely	-
Operations	Manager	No	-
Operations	Junior Leader	Yes	-

Table 6-12 Participants' responses to questions about written meeting records.

Section Conclusion

Different kinds of data were collected about meeting purpose, meeting effectiveness, and time spent meeting. Most participants said they spent more than half of their work time in meetings. Sixteen participants indicated their number of memberships in named groups which, when summed, ranged from 123-180 groups, with expected overlap. Although analyses did not establish relationships between portfolio and/or position level and either percentage of work time spent in meetings or membership in different groups that meet regularly, these findings contribute to our understanding of participants' work routines.

The Calendar Study results indicated a mean of 257 meetings per month that the group of managers might attend in the District's twenty large meeting rooms alone. Most participants said they participated in as many or more scheduled informal small group meetings as in meetings of

formally structured groups. The literature suggests that managers spend at least as much time in unscheduled meetings as they do in scheduled meetings. Figures from the Calendar Study and this Second Interview Study confirmed the First Interview Study observation that a considerable amount of health service managers' time has been spent meeting and suggested that there is a considerable organizational investment in meetings.

The importance and value of meetings is clear from these results. Further research is needed to explore whether and what changes in meeting practices could increase meeting effectiveness and diminish the burden placed on managers from time spent away from their departments in meetings and from workload resulting from meetings. There may also be value in recognizing that managers' work is characterized by meetings.

The next section examines the information transactions that were described in critical incident meetings.

6.5.2 Information and Transactions Theme

When information transactions were mapped for the 17 meetings, the number of transactions per meeting ranged from four to 12, as shown in Figure 6-8. There did not appear to be any relationship between the number of transactions described, the participant's portfolio or position level, and the number of portfolios represented at the meeting. Furthermore, there did not appear to be any relationship between number of transactions and the number of terms associated with meeting purpose used to index each transcript (Figure 6-7).
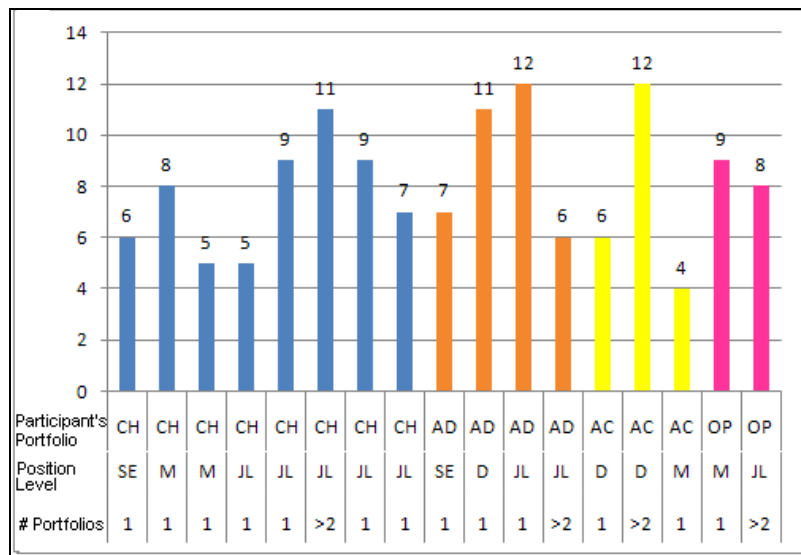
Figure 6-8 Number of Information Transactions per meeting showing participants' portfolio, position level and group homogeneity.

There were 133 information transactions involved in the seventeen critical incident decisions. Some of these information transactions included two or more types of information and/or

information behaviours. There were 265 pieces of information mentioned, 161 information behaviours and 317 possible pairs. These findings suggest that the process these health service managers used to inform their decisions was not a linear process. These findings related to information transactions are congruent with an observation by Simon (1977) that "*Each phase in making a particular decision is itself a complex decision-making process*" and may contain other phases within it (p.43).

As described in Subsection 6.3.3, each participant's transactions were separated into quartiles. When summed across all participants, information transactions were distributed over the quartiles with 19% in the first quartile (N=31), 27% in the second (N=43), 25% in the third (N=40) and 29% in the fourth (N=47). This suggested transactions with two or more types of information and/or information behaviours were less frequent in the first quartile and more frequent in the fourth quartile. Appendix G lists the information-information behaviour pairs, and notes the total number of times each was paired by quartile. Few information-information behaviour pairs occurred more than once. Four pairs occurred four times, three pairs four times and 24 pairs occurred twice. Little conclusion can be drawn from those that recurred.

The researcher observed that most of the critical incident decisions discussed in this Second Interview Study were operational decisions (Table 6-6), frequently described in the literature as "made with little thought" (Harris, 2009; Harris, 1998). All of these decisions were *unstructured,* not encountered before and not guided by policies or other rules. Mapping information transactions in critical incident discussion indicated that between 3 and 12 information transactions (Figure 6-8) informed these operational decisions, suggesting that these participants do inform operational decisions rather than make them "with little thought". The implication of developing policy to inform operational decisions that may recur is discussed further in Chapter 8.

The rest of this section examines participants' descriptions of the information and information behaviours that were part of these transactions.

Information

This part of the section presents study information related to the findings from both the interviews and the card sorting exercise. The findings are explored with respect to two research objectives:

To confirm whether these health service managers support each decision with a mix of information sources that may be internal or external and either explicit, tacit or cultural.

To explore whether there is a consistent order of need assigned to internal and external information, and whether there is a consistent value assigned to different information types so that some information is always needed first, before other information.

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Information in each transaction was examined closely from three perspectives:

1) Source, whether internal or external,
2) Category, whether explicit, tacit or cultural
3) Quartile or positioning in the sequence of information.

Categories and Types of Information Mentioned

Information transactions were indexed with 48 of the 60 types of information identified in the First Interview Study; each was used at least once. Information types identified in the First Interview Study have been presented by category in Table 6-13 with respect to whether they were mentioned or not mentioned by Second Interview Study Participants. Most participants mentioned explicit information most, then tacit and then cultural information when describing meetings. Of the 265 individual items of information mentioned by participants, 38% (N=102) were categorized as explicit, 32% (N=85) were categorized as tacit and 29% (N=78) were categorized as cultural.

Category	Types of information in category		Types mentioned in information transactions		Times mentioned in information transactions		Types not mentioned in information transactions	
	n	%	n	%	n	%	n	%
Cultural	24	26%	18	22%	56	21%	6	25%
Explicit	26	28%	22	27%	72	27%	4	15%
Tacit	10	11%	8	10%	61	23%	2	20%
	60	64%	48	59%	189	71%	12	20%
New Cultural	4	4%	4	5%	22	8%	0	0%
New Explicit	21	22%	21	26%	30	11%	0	0%
New Tacit	9	10%	9	11%	24	9%	0	0%
	34	36%	34	41%	76	29%	0	0%
Total Cultural	28	30%	22	27%	78	29%	6	21%
Total Explicit	47	50%	43	52%	102	38%	4	9%
Total Tacit	19	20%	17	21%	85	32%	2	11%
	94	100%	82	100%	265	100%	12	13%

Table 6-13 Information types, whether mentioned by Second Interview Study participants or not, presented by Category and when added to the framework

Participants described information brought forward by any member of the group, not just information they brought forward themselves. Information mentioned was also examined with respect to the participant's portfolio, and the number of portfolios represented at the meeting.

Cultural information was least mentioned and was excluded from two participants' descriptions of information their groups used. However, in three meetings, a meeting of Operations Portfolio members that involved external contractors, a meeting of all portfolios, and a meeting of Senior Executive, cultural information comprised at least 50% of information mentioned (Figure 6-9).
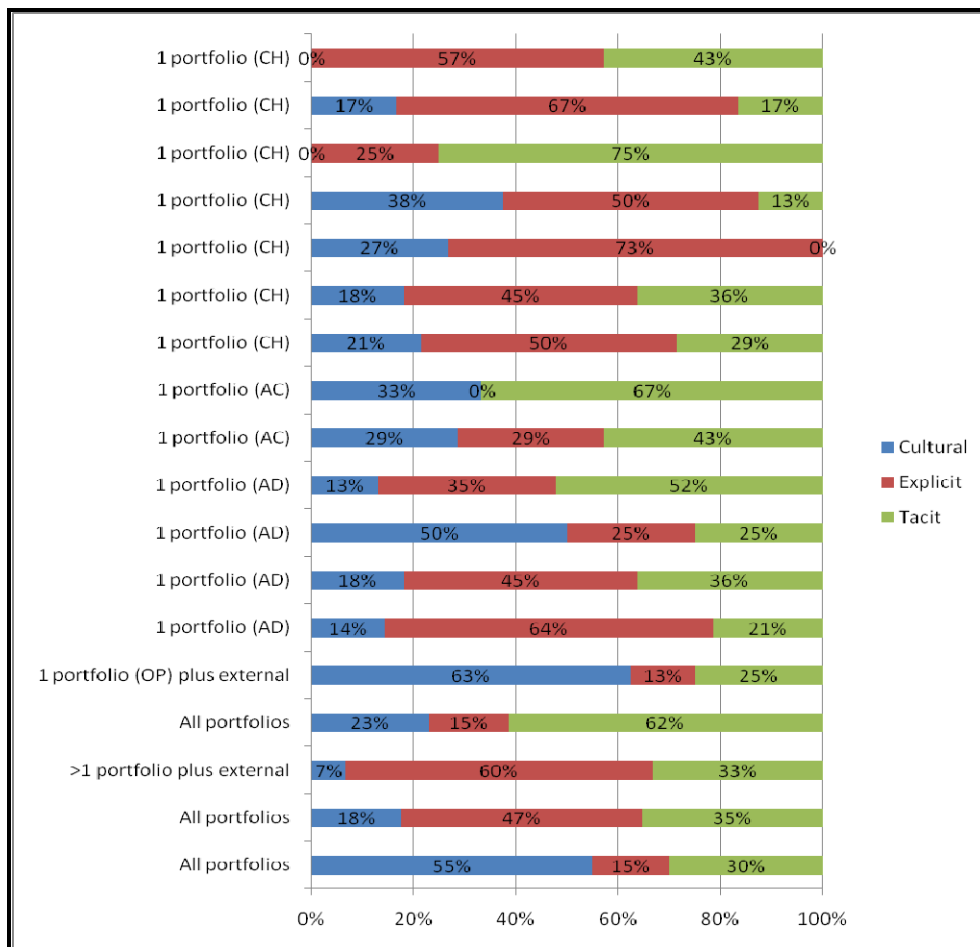
Figure 6-9 Mix of explicit, tacit and cultural information used to support a single issue, as described by each participant from memory

Order of Need for Information

One of the research questions asked whether a consistent order of need applied to information, such that internal information is needed first, then external information. As described above, once information transactions had been mapped, a sequential transaction number was used to place each transaction within the first, second, third or fourth quartile of the series of information

transactions each participant described.   This process revealed that all three information categories were mentioned in every quartile, refuting the suggestion that a consistent order of need existed with respect to information categories so that, for example, explicit information is always needed first, then tacit or cultural.

Most information mentioned in tacit and cultural categories was internal information. Explicit information mentioned came from both internal or external sources with some mentioned unclear as to source.
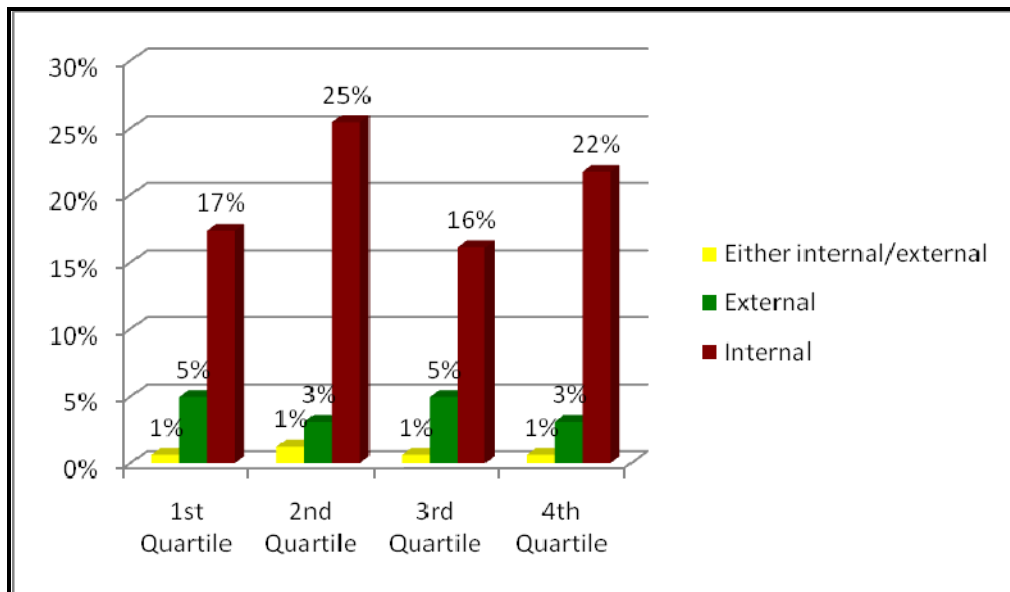
Figure 6-10 Information types (N=233; 100%) mentioned in critical incident meeting descriptions, by quartile, classified by Internal (N=195; 80%), External information (N=23; 16%), or either (N=15; 4%)

Information source, whether internal or external, together with its position in the order of information mentioned in each participants' description of critical incident meetings, whether the first, second, third or fourth quartile, is presented in Figure 6-11. Although the proportion of external to internal information did not vary noticeably across the four quartiles, internal information was mentioned most frequently (N=195) and external information least frequently (N=23) in the second quartile (Figure 6-11.) Six types of information mentioned 15 times were ambiguous as to source and could have been either internal or external.
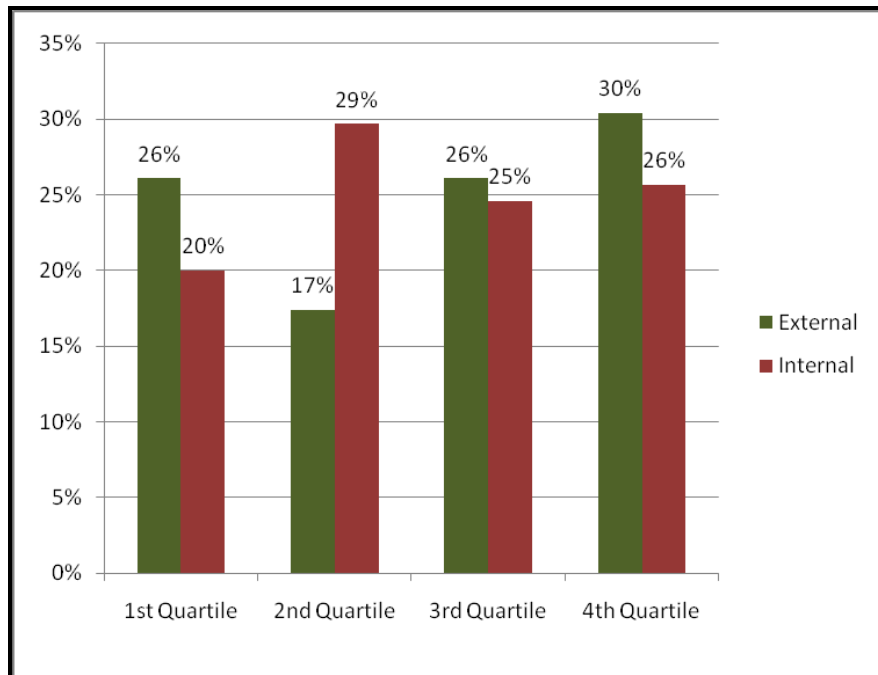
**Figure 6-11 Percentage of total Internal (N=195, 100%)
and total external (N=23, 100%) information mentioned, by quartile,
excluding information that could be either internal or external.**

A more detailed examination of information mentioned by quartile and by both source and category (Figure 6-12) indicates participants mentioned internal tacit information, the skills and knowledge health service workers acquired through education and experience, most frequently.
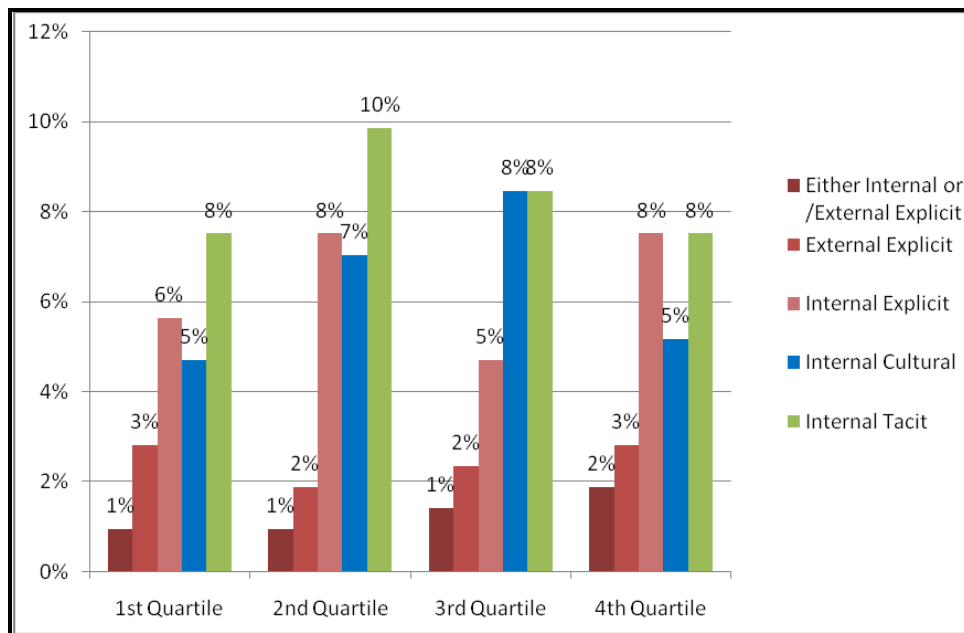
**Figure 6-12 Information (N=233; 100%) mentioned in each quartile, by source and category,
excluding external cultural information (N=2; 0.86%)**

Mention of internal cultural information and internal explicit information in these descriptions appeared to vary most. There was less internal cultural information mentioned in the first and fourth quartiles and more in the third quartile, and more internal explicit information mentioned in the second and fourth quartile and less in the third quartile. However, not enough variation existed to suggest that internal explicit information should always be shared before internal cultural information.

Information Type	Total	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
Knowledge, experience with process	34	6	9	10	9
Public opinion	14	0	2	9	3
Understanding other departments	11	4	4	1	2
Time resources	10	5	2	0	3
Task importance	10	5	1	4	0
Human resources	10	1	2	6	1
Expertise	10	3	2	1	4
Decision stakes (impact, ramifications)	10	2	4	1	3
Decision complexity	10	0	4	2	4
Evidence based research	9	4	1	4	0
Population health	8	2	3	2	1
Experience	8	3	2	1	2
Mission, vision, goals, strategic plan	7	1	4	1	1
Conflicting priorities	7	0	4	1	2
Report on status of current situation	6	5	1	0	0
Utilization data	5	1	0	3	1
Stories of similar situations	5	0	1	2	2
Physical resources	5	0	4	1	0
Existing programs and services	5	0	0	2	3
Demographics	5	0	5	0	0
P/politics	4	0	0	0	4
Other plans	4	0	0	4	0
Organizational expectations	4	0	2	2	0
Opinion surveys	4	2	2	0	0
Meeting records	4	1	2	1	0
Likelihood of implementation	4	0	0	0	4
Legislation	4	3	0	0	1
Financial resources	4	0	2	2	0
Decision making framework	4	0	1	0	3
Conflict of interest	4	2	0	1	1

Table 6-14 Information types mentioned more than once in critical incident, by quartile

As a next step, each information type mentioned four or more times was re-examined, first to determine whether it was always mentioned in a certain quartile and then to determine whether it was never mentioned in a certain quartile, as shown in Table 6-14. Some of these were

mentioned in every quartile and others just in one (Table 6-14), suggesting no consistent order with respect to information type, but there was insufficient data or detail to make meaningful conclusions. Participants described meeting events from memory so it was neither possible to verify nor practical to attempt to analyse in further detail the order in which specific types of information were shared by those present at these meetings.

The order in which different information types are shared may rest with the information sharers who decide, from perspectives of their own unique position or departmental perspective or from their store of clinical or tacit knowledge, whether the information they have is important enough or relevant enough to share. If they are certain that its value has already been outweighed by information that is more important, it may be that they do not share. Information value has been discussed further in the Information and Appraisal theme below.

Use of Research-Based Information

One of the researcher's main interests throughout this study related to how new research-based information entered the organization to support health service managers' decisions. In both interview studies, types of information that would incorporate research information were mentioned. This part of the section explores participants' mention of research evidence, either directly or through references to journal articles and similar publications.

Behaviour Category	Behaviour	Position	Participant's portfolio	Portfolios Represented at the Meeting	Quartile
Using Information	Set priorities	Junior Leader	AD	1 portfolio	3
Using Information	Take action	Junior Leader	AD	1 portfolio	3
Identifying Information Needs	Answer questions	Junior Leader	CH	>2 portfolios	3
Identifying Information Needs	Make sense	Junior Leader	CH	>2 portfolios	3
Identifying Information Needs	Reduce uncertainty	Junior Leader	CH	>2 portfolios	1
Identifying Information Needs	Answer questions	Junior Leader	CH	>2 portfolios	1
Sharing Information	Information transfer	Junior Leader	CH	>2 portfolios	1
Identifying Information Needs	Reduce uncertainty	Junior Leader	CH	>2 portfolios	1
Using Information	Identify goals and objectives	Manager	CH	>2 portfolios	2

Table 6-15 Mention of research information in critical incident discussion, by behaviour category, behaviour, portfolio (AC=Acute Care, AD=Administration, CH=Community Health), meeting homogeneity and quartile

Research-based information was mentioned directly by only three Second Interview Study participants in discussion of critical incidents. One of these was a Community Health Manager who mentioned using research evidence once in the second quartile. The other two were Junior Leaders. A Junior Leader from the Community Health portfolio mentioned sharing research

evidence once in the first quartile, and identified the need for research evidence five times, three times in one transaction. A Junior Leader from Administration mentioned using evidence based research information, twice in one transaction. In these rare instances in which Second Interview Study participants mentioned health research, it was included in the first three quartiles of the meeting descriptions, not towards the end of the meeting, after internal information was considered, as observed in the First Interview Study.

In discussion following exploratory questions, one participant mentioned SBARS – Situation, Background, Assessment/Alternative, and Recommendation – the written one-page situation report used to communicate on issues for approval or information.   SBARS would be expected to include mention any key relevant research available.

> *Let's not ask each other on the face of it to accept something,… [rather let's] say this is the issue, it is not what I think it is because this is what I am seeing, this is the evidence, both what I have seen and what has happened and what the literature can add … we are trying to get into the rhythm of developing SBARS so for instance when somebody is charged with doing some work makes a recommendation to the executive it comes as an SBAR so the work is all done, and enough background is there for us to be able to make a decision. (Participant Group 4-B)*

The following two quotations suggest two routes by which these participants acquired research based information to inform decisions.

> *That is why you go to conferences, because somebody has had time to digest it and come up with a best practice and try it out so you can learn from them quickly. (Participant Group 4-B)*

> *…we have done literature searches and scoured (Participant Group 4-B)*

Routes by which research entered the organization to inform health service managers' decisions identified in the Second Interview Study included research being incorporated into explicit and tacit information shared orally at meetings, incorporated into written SBARs used to share information for approval, acquired at conferences blended with experience in a way that allowed it to be applied most quickly, and, when needed, acquired through active search. Participants' use of research information was re-examined in both interview studies and is discussed further in Chapter 7.

Section Conclusion

These study findings confirmed that these health service managers use a mix of sources, categories and types of information to support decisions. It indicated that these are shared in no consistent order such that some are needed first and then others follow. Information transactions in each quartile were examined with respect to amount of explicit, cultural and tacit information and following that, with respect to group size, meeting purpose, and group heterogeneity. Participants' descriptions suggest little variation in category and source across the four quartiles. Neither did it seem that meeting purpose influenced use of information from a particular source.

All groups used a mix of cultural, explicit and tacit information to support decisions. Direct mention of research evidence was rare. Research would have already been incorporated into explicit and tacit information shared orally at meetings.

Nothing in these findings suggested that health service managers use internal information first to set context, before proceeding to use external information to make decisions or other organizational progress. It appeared that more internal information was used than external information, and that a mix of information by source and category was used to support group decisions.

The information used in these calculations came from participants' memories of information shared at meetings. Further research using meeting observations to gather data would allow firmer conclusions.

The next part of the section examines information behaviours described during discussion of critical incident situations.

Information Behaviour

As discussed in Chapter 2, there has been less research on the information behaviour of health service managers than there has been on managers in general, and less on managers in general than there has been on scholars and on members of the public. This part of the section explores the information behaviours included in managers' descriptions of critical incident meetings using the framework described in Subsection 6.3.4. This framework included 72 information behaviour terms in five broad categories. After indexing, 54 of the 72 terms had been used to index at least one information transaction.

Broad categories of information behaviour across the seventeen descriptions of group discussion were analysed by quartile (Figure 6-13). Behaviours categorized as *Sharing Information* and *Using Information* were mentioned most frequently and spread across the quartiles, with slightly fewer of these activities in the first quartile, congruent with observations in the literature of information use in all stages and phases of decision-making (Saunders and Jones, 1990; Treacy, 1981)

Although *Information Seeking* activity received little mention, it was described twice as frequently in the fourth quartile as in each of the first three. This might reflect the group considering whether as a next step to address gaps in information they identified as needed in the first three quartiles.
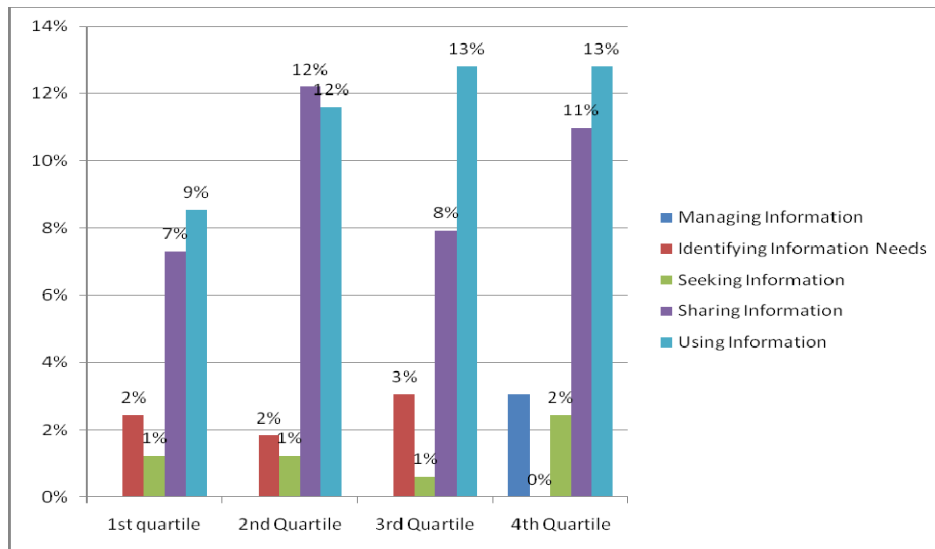
Figure 6-13 Percentage of total information behaviours (N=161; 100%) mentioned by participants, in each Information Behaviour Category by Meeting Information Transaction Quartile

No behaviours in the *Managing Information* category were mentioned in the first three quartiles and no behaviours categorized as *Identifying Information Needs* were mentioned in the fourth quartile. This makes sense as meetings are reaching a conclusion in the fourth quartile at which point managing information appeared to be a more likely activity than identifying information needs.

Information Behaviour by Group Size

As a next step, information behaviours were examined by group size. These were summed for all meetings and then the percentage, by category, calculated for smaller meetings of groups with two to seven members (N=4) and for larger meetings of groups with eight to thirty members (N=13). Although there were fewer meetings of smaller groups described by participants, two thirds of the information behaviours mentioned (N=107; 66%) took place in meetings of smaller groups.

Using Information was the most frequent information behaviour category in small groups; *sharing Information* was the most frequent information behaviour category in larger groups.
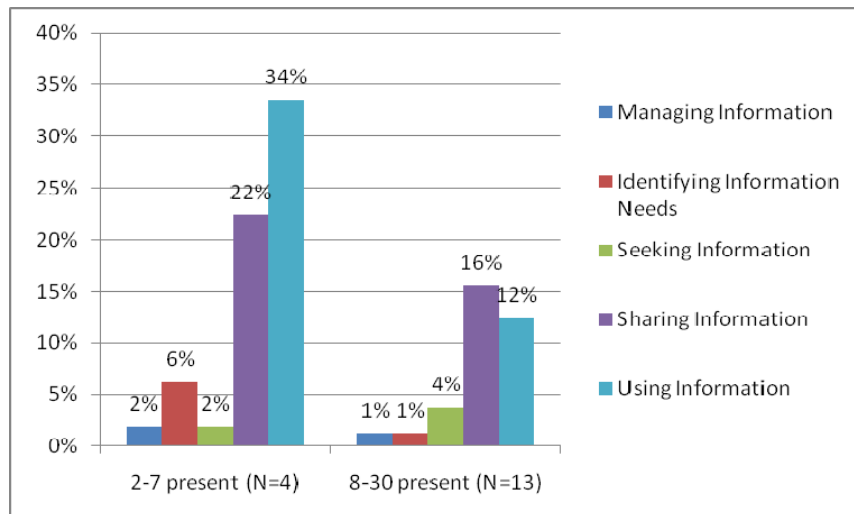
**Figure 6-14 Percentage of information behaviours (N=161; 100%)
by category for four smaller and 13 larger groups.**

Information Behaviour by Group Heterogeneity/Homogeneity

Information transactions were examined next with respect to group homogeneity, whether

meeting participants represented one or two or more portfolios (Figure 6-15).
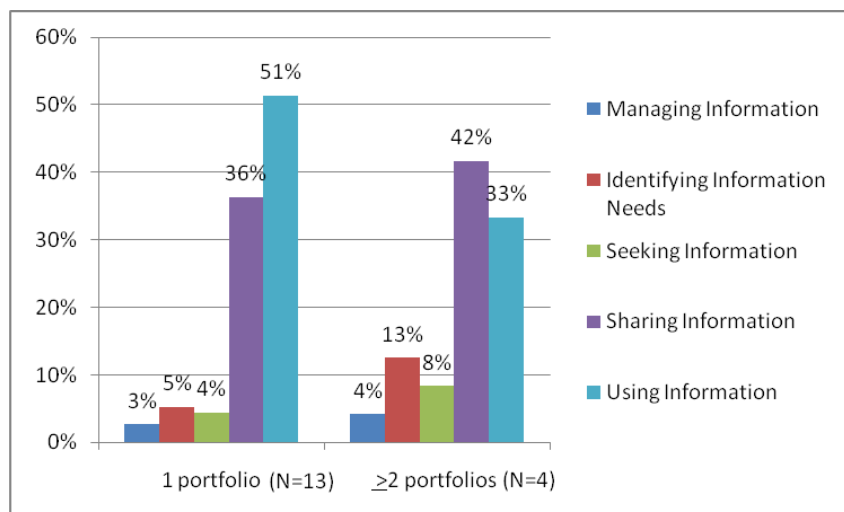
**Figure 6-15 Percentage of Information behaviours in each category for
4 heterogeneous groups (N=48 behaviours, 100%) and 13 homogenous groups (N=113
behaviours, 100%)**

Descriptions of groups with members from a single portfolio included mention of behaviours

classified as *Using Information* most frequently while *Sharing Information* was the information

behaviour category mentioned most frequently in descriptions of groups with members from two

or more portfolios. Groups with members from two or more portfolios mentioned both

Information Seeking and *Identifying Information Needs* more frequently than groups with

members from just one portfolio. There was little difference in behaviour mentioned that was

classified as *Managing Information* and no differences noted that might be associated with number of portfolios represented at the meeting

Section Conclusion

The findings reported in the Information and Transactions theme reported data that had been gathered through qualitative interviews, examined using within case analysis, pooled and reported quantitatively. Information and information behaviours indexed within mapped information transaction relationships were examined by quartile, category and type.

This exploratory study confirmed that multiple information types are used to inform a single decision, and that different information behaviours might be associated with information types at different times. It refuted a suggestion from the First Interview Study, that internal information is used before external information and research based information. It proposed an alternate explanation, that information types from different categories and sources are used across the decision process.

The next subsection reports results from the Information and Appraisal theme.

6.5.3 Information and Appraisal Theme

One of this study's research questions inquired as to how health managers' assessed information for relevance, value, and credibility. There were no comments mentioned during descriptions of critical incident meetings that related to these. Relevance was judged as too complex and time consuming to explore in this Second Interview Study. In response to exploratory questions, participants described how they approached assessing or appraising information shared orally for credibility. Information appraisal for value was explored through critical incident discussion and a card sorting exercise.

Presentation of the findings related to appraising information begins with results of the card sorting exercise designed to determine whether a shared consistent value is imposed on different categories and types of information or whether value varies depending on the individual need or situation.

Information Value

Participants were asked to consider each type of information with respect to the group critical incident decision just discussed in the interview, or if that decision was not suitable for the Card Sorting Exercise, with respect to a recent decision that did require different types of information. They were asked to indicate the value that they would have placed on that type of information, if it related to their critical incident and if all information was equally and easily available to them.

Data were explored first with respect to consistency in values assigned to information types. There were no information types that all seventeen participants considered "need to know". There were no information types that fewer than five participants considered "need to know". There were no information types that more than three participants considered "not essential". When assigned values were considered by category (Table 6-16), almost 2/3 of values assigned were "need to know" and only 5% were considered "not essential". The frequencies of values assigned to each information type are shown in Appendix G.

Category	# types in Category	Possible number of choices (1 choice per participant per type)	Participants' Assigned Value					
			Need to know		Nice to know		Not essential	
			N	%	N	%	N	%
Cultural	24	408	260	26%	128	13%	20	2%
Explicit	26	442	358	35%	62	6%	22	2%
Tacit	10	170	120	12%	39	4%	9	1%
Total	60	1020	738	72%	229	22%	51	5%

Table 6-16 Values assigned to information types by category

Each participant's individual choices were considered with respect to portfolio, career years, age, and position level. Five participants assigned fewer "need to know" values in all three information categories than other participants. Three of these were Junior Leaders, each with fewer than five career years while the other two were managers, each with 30-34 health services career years (Figure 6-16).

The eight types of information considered as "need to know" by 16/17 participants were examined; all but one of the diverging values were chosen by participants at the Junior Leader level, each with fewer than five years of health career years. One Junior Leader chose four of the divergent values, another Junior Leader chose two, and one other Junior Leader chose one. The final divergent value was chosen by an experienced manager with 30 health career years.

There were fewer types of information in the tacit (N=10) category than explicit (n=26) or cultural (n=24), so values assigned were summed for all participants and examined within each category with each represented as 100% (Figure 6-17). The most frequently assigned value was "need to know" with each category being assigned this value at least 65% of the time. A slightly higher percentage of information in the explicit category was considered "Need to Know". Participants assigned "Not Essential" to 5% of their choices in each category. These results suggest that information in the explicit category may be judged "need to know" just slightly more often than tacit and then cultural information.
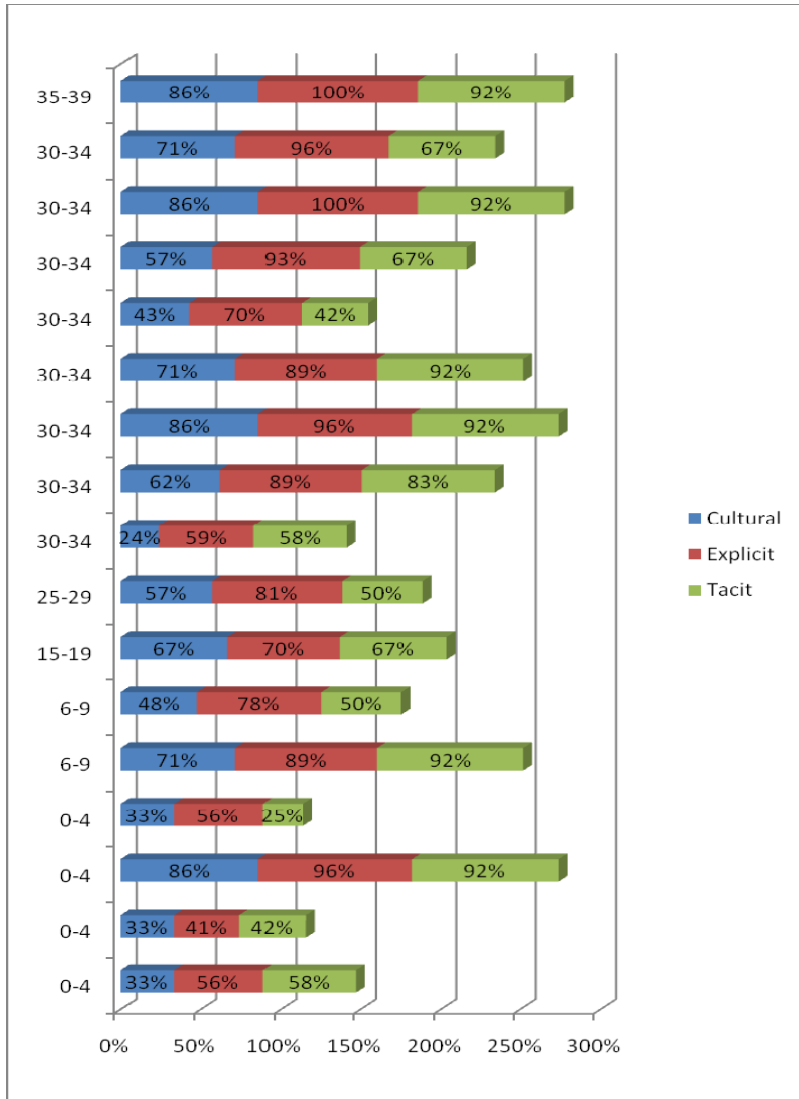
Figure 6-16 Percentage of "need to know" assigned to each category by each participant, arranged by number of health services career years
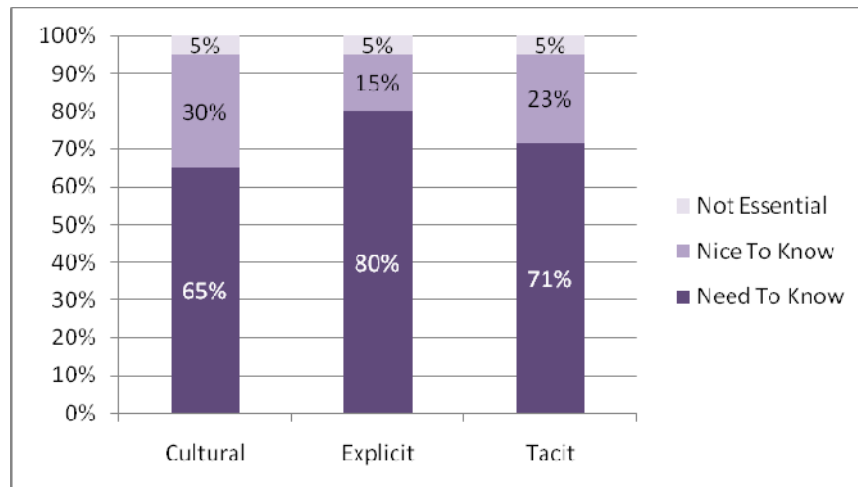
Figure 6-17 Value assigned by percentage within each category of information for Explicit (N=442; 100%), tacit (N=170; 100%) and cultural information (N=408; 100%)

Comparison of Information Value

The researcher had applied the following assumptions to information value: that more valued information was used first and that decisions would not be made without the more valued information.

Most frequently mentioned Information Types in Second Interview Study interview participants' descriptions of meetings	Times mentioned in critical incident Information interviews	Times Chosen in Exercise		
		Need to know	Nice to Know	Not Essential
Explicit				
Public Opinion	14	7	9	1
Human Resources	8	15	2	0
Evidence Based Research	6	16	0	1
Mission, Vision, Goals, Strategic Plan	6	15	1	1
Population Health	6	14	3	0
Time Resources	6	15	2	0
Cultural				
Conflicting Priorities	8	12	5	0
Expertise	8	13	3	1
Report On Status Of Current Situation*	8	n/a	n/a	n/a
Stories Of Similar Situations*	8	n/a	n/a	n/a
Experience	6	15	2	0
Tacit				
Knowledge, Experience With Process	36	14	3	0
Understanding Other Departments*	13	n/a	n/a	n/a
Decision Stakes (Impact, Ramifications)	6	16	1	0

Table 6-17 Values Assigned to most frequently mentioned information types
*Not mentioned in the First Interview Study
or included in the Star Chart so not included in Card Sorting Exercise

Participants frequently judged information types "need to know" so, for comparison, the fourteen information types mentioned most frequently in critical incident meeting discussion and thirteen

information types not mentioned at all in critical incident meeting discussion were compared with card sorting exercise values (Table 6-17).

The information type mentioned most commonly in critical incident meeting discussion was *Knowledge/experience with the process,* mentioned 36 times and in all four quartiles and valued as "need to know" by 14/17 participants. The next information type mentioned most commonly was *Public Opinion* was mentioned 14 times in the second to fourth quartiles. In the card sorting exercise. Public Opinion was more frequently valued "nice to know" than "need to know".

Mentioned in the First Interview Study but not mentioned in Second Interview Study participants' descriptions of critical incident meetings	Times mentioned in critical incident interviews	Times Chosen in Exercise		
		Need to know	Nice to Know	Not Essential
Explicit				
Accountability	0	16	1	0
DHA policies and procedures	0	15	2	0
Epidemiology	0	15	1	1
Position descriptions	0	6	8	3
Privacy issues	0	12	4	1
Quality	0	16	0	1
Respect	0	14	1	2
Cultural				
Bias among decision partners	0	9	6	2
Failure to practice what we preach	0	9	5	3
Interpersonal relationships	0	9	7	1
Required cultural changes	0	11	6	0
Tacit				
Confidence in judgment	0	11	6	
Outcome sustainability	0	12	4	1

Table 6-18 Information Types identified in the First Interview Study not mentioned in Second Interview Study descriptions of critical incidents, as valued in the Card Sorting Exercise.

Thirteen of the 59 types of information identified for use in the card sorting exercise were not included in participants' descriptions of information transactions at meetings. These are listed in with corresponding values that these participants assigned in the Card Sorting Exercise (Table 6-18). Some information types not mentioned during descriptions of interviews were among these valued most frequently as "need to know" in the Card Sorting Exercise study.

This comparison was interesting but not conclusive. Meeting observations would have been more accurate than participants' recall with respect to information types that the groups used.

The card sorting exercise might have been realistic if need to know choices had been limited to a small number, for example a maximum of five need to know choices. Some information types

frequently valued as "need to know", but not mentioned in critical incident descriptions, may not have been accessible in a single meeting. Alternatively, participants may have been so clear about them that they did not need to be mentioned.

The next part of this section explores changing values with respect to specific information types.

Changing Values – "Invisible Information"

Related to the research question about a consistent value applied to information types, the researcher wanted to know whether value applied to information type might change during the decision process, and whether changing information value may be related to satisficing.

The first of the two following quotations was a situation where information was first identified as "need to know", without which a decision could not be made. However once the needed information had been accessed and absorbed, the group dismissed the information as "not important". The second was a request to a group to provide information in a crisis situation but the group's members felt from the beginning that their information would have no impact on the decision. These two quotations suggest that the value of some information may change depending on priority given to other information already accessed and absorbed.

> *We talked about volume and we talked about the amount of resources that were being spent in this type of a situation …the fact that we were setting precedent was more important. We said we needed that information [utilization and costing information] … [once we obtained and considered the information] we said then "not important". (Participant Group 1-A).*

> *[the information that had most influence on our decision was] not a piece of information [but] … a feeling that we might be going through this exercise only to be directed as to what was going to happen. … We also know that sometimes … there are external forces that guide decision-making that we have no control of, and in this case it was probably a financial overrun … and regardless of the argument that we put forward, that may be the deciding factor. (Participant Group 3-B)*

Both cases involve information that decision-makers were aware of but did not have before them. In the first case, information that decision-makers judged "Need to know", without which they were not able to move forward, had to be gathered and tabulated, then was dismissed once received and considered. In the second case, although information was urgently requested with a short timeline, those pressed to provide the information felt that it would not be considered because the financial information already known to decision-makers would trump any information they could provide no matter what it was. In the second case, the information still had to be gathered and reported. Invisible information is always accessed and considered; it does not remain an unresolved information gap.

In both cases, the value of "need to know" information changed or was expected to change from "need to know" to "not essential". It would not influence the decision so, as a working label for this research, could be described as *invisible* with respect to the decision process. It was

present but did not seem to weigh in to the conclusions. The word "invisible" was chosen in favour of other likely terms such as "absent" or "missing" because the information was judged needed and was acquired and considered, it just did not appear to count in the decision. The researcher has considered how a group might best record a decision and the information that informed it (de Stricker and MacDonald, 2007, MacDonald and de Stricker, 2006). "Invisible" reflects the researcher's opinion that information that factored in decisions would be more likely to be included in a decision record than "invisible" information that did not factor in the decision. The value of information is not consistent and can change within a single decision situation. These observations prompted the proposed definition for invisible information:

> *Invisible information* involves information considered "need to know" before it is accessed to inform a decision, but then once accessed and considered is dismissed as "not important", and so not considered to be a factor that influenced the decision.

An example of *invisible* "need to know" information might be the number of people with a specific terminal, but easily preventable, disease in a community. Decision-makers might initially consider this information so important that they will not move forward without it. Then once accessed, may realize their decision will be the same whether one person had the preventable condition, or 500 had it. There is a resource cost associated with invisible information as decision-makers may not be willing to move forward without it. Once accessed and judged "not important", invisible information is less likely to be included in the decision record. This discussion of invisible information may relate to both information value and satisficing.

The next part of this section explores participants' comments related to assessing credibility of oral information.

Assessing Credibility

It has been suggested that information sharing involves appraising activity on the part of both the information sharer and the information receiver (Macdonald, 1998). It has also been suggested that effective group function depends on members of a group knowing what the others know and trusting in the others to share credible information (Lewis, 2003).

Questions arising from the First Interview Study included whether and how participants assessed credibility of oral information shared with them in group situations. The following quotation sums up one participant's view of the organization's perspective on challenging information:

> *Let's not ask each other on the face of it to accept something, this is not about not trusting people this is about learning and role modeling, how to say "this is the issue, it is not what I think it is because this is what I am seeing, this is the evidence, both what I have seen and what has happened and what the literature can add to that and this issue … So it is like the SBAR I suppose (Participant Group 4-B)*

Triggers for questioning oral information include an information giver's passion about a subject that might cloud judgment or suggest bias, and statements that seem to be based only on intuition, as suggested in the following two quotations:

> *I guess I would say there are times when you know you got to check things out because an individual will have passion, and a strong point of view and either through experience with that individual or because of the knowledge you have either in the group or one-on-one, the red flags go up…challenge it right then and there would be one thing. (Participant Group 4-B)*

> *I do look for sweeping comments, you know, "the research says", "the literature says"; really, my ears prick up… I do want to know what the source is and how credible it is … [in a recent situation, I doubted credibility of information being shared]. So we did challenge that and I said, "you know it is not appropriate for us to be making a decision based on this…"… before we made a decision [we asked] that person to go back and find the source (Participant Group 1-C)*

Participants had a shared view on the immediate need to question or challenge information that they suspected to be incomplete or out of date and said if they doubted the credibility of information shared orally, they would question it immediately. Some mentioned being sensitive to how that might be received, and described their typical approach as "soft" or "gentle".

> *I would probably say "thank you, that is something to consider, I am wondering whether that fits with what we are already doing, what the evidence base is for that" and I might ask the person if they have more information or we might get together afterward to look at that. (Participant Group 1-C)*

> *I would voice …my concerns about that …say "that information is out of date or it is not complete" … and that person will go offer to go back and double check it, or go to … whoever is likely to have the information. (Participant Group 1-A)*

> *...I will say, "so how do we know that", or "are we sure we know that and it is good information?" (Participant Group 1-B)*

In situations where a participant remained doubtful about information others found credible, one participant said she would follow-up after the meeting.

> *You would find yourself going back and checking for more information. (Participant Group 4-B)*

These findings suggest that when they doubt the credibility of information being shared orally, these health service managers do not hesitate to challenge it.

Section Conclusion

Results presented in this section suggest that in oral information sharing, information is doubly appraised for both credibility and value. Health service managers appraise information for value when they identify it as a need, and then they reappraise it after they receive it. The value of information may change in a single decision situation, depending on the information, the context and possibly other information already accumulated.

This Second Interview Study found that information receivers do appraise information for credibility after they receive it. Results of the First Interview Study indicated that information givers appraise themselves as credible information sources before they share information.

Further research is needed, perhaps using meeting observations to gather data, to determine how members filter information that they have to share and whether, as information accumulates, there are differences in the weight assigned to different information types or categories. The next subsection explores information sharing behaviour with respect to challenges associated with information gaps and inappropriate information quantity.

6.5.4 Information and Quantity Theme

One of the Study Research questions was to explore whether these health service managers were challenged either by too much or too little information and whether these might both occur in one decision situation. The researcher was also interested in knowing whether satisficing might be a coping mechanism for dealing with inappropriate information quantity (Bawden and Robinson, 2009). This subsection discusses information gaps, inappropriate information quantity and satisficing.

Information Gaps

These Study participants were asked to describe group critical incident decisions made in a single meeting, so although over half of participants mentioned at least one information gap, these gaps did not impede decision-making in these situations.

Perhaps due to the nature of the study sample, critical incident decisions made in a single meeting, or to the source of the data analyzed, participants' memories of particularly effective meetings, there were few information gaps reported. There were no information gaps mentioned in the first quartile and only marginally more gaps mentioned in the second quartile than other quartiles (Figure 6-18)
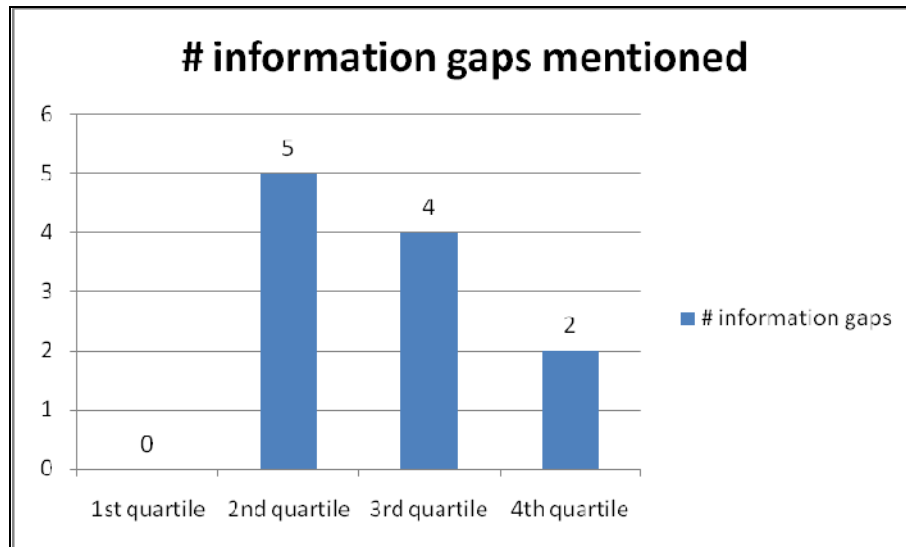
Figure 6-18 Frequency of mention of information gaps, by information transaction quartile

All participants but one chose to describe effective meetings where critical decisions made were informed by information shared orally. These results suggest that half of the groups satisficed; they made decisions despite identified information gaps.

The next part of this section considers participants' responses to questions about appropriate information quantity.

Inappropriate Information Quantity

As an exploratory question, participants were asked to comment on the information quantity typically available to support a decision, whether they more frequently were challenged by too much information or not enough. The most frequent response was "both", that sometimes there was too much information and at other times not enough, as indicated by the following examples.

> *If I generalize …it is too much. Not all the time, it depends … on the topic … [there are decisions] where there is not enough information. But in other areas, there are tons; you just can't read it all (Participant Group 4-B)*

> *For me, I can say "both" and it is about 50-50. Sometimes …way too much, just bombarded. … with one portfolio, I tend to get too much information in groups of meetings and in others it is not enough. (Participant Group 1-B)*

> *In some instances for a single decision, we have enough, in others not enough. (Participant Group 1-A)*

> *… with acute care, I find … there is not a lot of information but its "that's enough to make a decision". And in the community portfolio, it may be the exact opposite …more analytical … information overload… (Participant Group 1-B)*

The following two quotations are examples of comments from participants who did say they either generally had too much or not enough information.

> *Just generally. I would say usually too much. Because I tend to try to check out information sources that might be relevant …so by the time I go to a meeting …there is generally more than I want…for any of the groups that I would work in that is probably is one of the bigger challenges there is so much information …there is a lot of information that can be challenging to use effectively. (Participant Group 1-C)*

> *I am on a Steering Committee right now where we don't have enough, we aren't sure where we want to go or who is responsible for gathering the information. One of the members said "we are not qualified to make a decision, we aren't going anywhere without information". Sometimes it is not clear who the gatekeeper is. (Participant Group 1-A)*

One participant who responded with "not enough" described a decision made using satisficing, subsequently blocked when the group learned a specific crucial piece of information had not been communicated to them.

> *Not enough, not enough… sometimes you are making decisions in groups and later you find out perhaps that you can't move forward with that because we didn't know a piece information or another piece of information comes from the top that impacts … that we didn't know about. (Participant Group 1-C)*

In the following example, a participant who described being overwhelmed with information described ignoring it as a coping mechanism.

> *There are so many different things that are going on that I find it very hard to give anything credibility … they want this information and, man, we don't have time to do it all and I find that to be a real real problem as far as meetings and communication and stuff like that coming out – we are flooded by it, far far too much. (Participant Group 2-D)*

These findings confirmed the First Interview Study observation, that these participants were challenged by inappropriate information quantity, but they do not explain why they satisfice. Satisficing is discussed in the next part of this section.

Satisficing

The findings related to information gaps suggest that at least some of these groups satisficed, made their decisions despite identified gaps. Findings related to inappropriate information quantity confirm those in the First Interview Study, that these health service managers were challenged both by not enough information at times and by too much information at times.

In one case, a participant said she was not adversely affected by information quantity, either too much or not enough, because she stopped it when she had enough. This may be similar to the saturation effect described by Saunders and Jones (1990).

> *… I would say that I have never found myself in a situation where I had to make a decision when I didn't have enough information. I never have too much because I stop it. After a while, once you start seeing it recurring – I don't ask for any more. (Participant Group 4-B)*

This quotation considered together with the other results of this study including the lack of consistent value assigned to types of information, "invisible information", the information categories and types used throughout decisions suggest that satisficing may be less a coping

mechanism than common sense. Health service managers may satisfice when they reach a saturation point where they have enough information; once they have enough they do not keep looking for it. Given the mix of different types of information used to inform each decision, it is quite possible that in some situations there will be too much of one kind of information and not enough of another, but no participant described this situation in critical incident discussion.

These results suggest that there may be an information saturation point similar to a data saturation point in qualitative interviewing, as discussed in the next section.

Information Saturation Point

The following proposed definition for information saturation point may help explain why participants in this study made critical decisions despite gaps.

> The *information saturation point* is reached when enough information of different types are gathered so that any additional information, including information initially identified as "need to know" will not make a difference against the weight or significance of the information that has been accumulated.

The information saturation point, like satisficing, is a factor of both time and amount of information acquired and absorbed. It may differ from satisficing in that it is less a factor of balancing cost with efficiency than it is a factor of enough information of each type judged needed by the decision point.

Reaching the information saturation point can change the value of "need to know" information to "not needed" with respect to a specific decision. If there is certainty that the information will not make a difference no matter what it might be, the decision-makers do not need to access it then the information saturation point has been reached.

The researcher considered information saturation with respect to invisible information. The two concepts are not directly related. Information identified as needed up to the information saturation point, then determined not needed differs from invisible information in that until invisible information is accessed and considered, the saturation point would not be reached. Information initially judged as needed but not accessed before the saturation point remains an unresolved information gap. There are no gaps in invisible information.

An *information type saturation point* might be reached with respect to just a certain type of information and not others. For example, decision-makers may have all of the bed utilization data they need but not enough information on disease prevalence in the community. In this situation they would stop searching for, sharing and considering utilization data and keep looking for disease prevalence data.

Section Conclusion

The Information and Quantity theme findings included that participants satisficed and experienced situations where they were faced with both too much information and not enough. One participant described stopping information before too much information accumulated. This comment suggested that there might be an information saturation point related to satisficing.

6.6 Study Conclusion

This Second Interview Study confirmed that health service managers use a combination of sources, categories, types and forms of information to support decisions. It suggested that both internal and external information is used across the decision process and there is no consistent order of need for these. It also suggests that information types do not carry a consistent value, and that value can both depend on context, and change when considered with respect to information already accumulated. These issues need to be confirmed in subsequent research.

Although participants in this study were challenged by not enough information and too much information, and probably experienced both of these in individual decision situations, their satisficing was more likely to be due to reaching the information saturation point that it was a coping mechanism for inappropriate quantity.

This study confirmed both the importance of meetings in these managers' work and the burden placed on these participants by having their working day consumed by meetings that displaced their departmental work and generated further work for them. The purpose of meetings was not always clear and meetings were not always seen as effective. Meeting records appeared to be used more often to prompt action for the next meeting than to provide a written record for future reference.

These results suggested that of available definitions on information sharing, a 1973 definition adequately captures participants' descriptions of their information sharing behaviour. This study confirmed not only that information sharing was dominant over information seeking in these health service managers, but indicated that using information was the dominant information behaviour in smaller groups while larger groups spent more time sharing information. The participants' comments suggested that smaller groups were more productive, perhaps because they focused on single issues and took a project management approach. The study results also indicated that participants were adept at assessing the credibility of information shared orally with them.

Although there was little direct mention of informing decisions with research-based information, participant discussion suggested that decisions were informed with research information and that

it entered the organization several ways and was probably mixed with other types of information rather than shared in its pure form.

The next chapter discusses research findings across the three studies.

Chapter 7 Discussion

This chapter discusses the findings from the three separate studies that when considered together, contribute to research on health service managers, the information they use and their information behaviour.

This study began with the one main research question and one secondary question.

1) What are the information needs and uses of health service managers, what are their information behaviours, and what are their barriers and challenges?
2) What information seeking models best represent the information needs of this group?

At the conclusion of the literature review, the following four research questions were identified:

1) Why do health service managers need information in their work?
2) How do health service managers approach getting the information they want or need?
3) What information do health service managers need and use?
4) What information issues and problems do health service managers face?

These four questions have been used to organize discussion in this chapter. Results are presented with respect to these four general research questions, and include more specific research questions that contributed to answering them across the three studies.

7.1 Why do health service managers need information in their work?

These health service managers needed information to solve problems and make decisions related to their own responsibilities as managers. They also shared perspectives and experiences with other managers to contribute to the overall operation of the health service organization.

Participants in both studies described uncertainty, complexity and change in their workplace. These are elements of a dynamic environment as characterized by Laufer *et al. (*2008). Decisions and problems faced by study participants were unstructured (Simon, 1960), often multi-level (Heller *et al.* 1988) and typically made in groups. Participants were challenged by frequently imposed deadlines and uncertainty about processes to follow to achieve goals. The tended to identify one solution rather than compare and evaluate two or more alternatives. Their decision-making practices were similar to those described as Naturalistic Decision-making (Lipshitz and Strauss, 1997).

This research examined data gathered through 36 interviews in two separate studies. Cases included crisis, problem, and opportunity situations (Simon, 1977) that might have been informed by or have led to development of clinical, administrative and public policy (CHSRF, 2000) Each interview involved a critical incident decision easily categorized within at least one the ten traditional managerial roles identified by Mintzberg (1973). Managers needed information to address responsibilities arising from their interpersonal roles, information processing roles and decisional roles. With the exception of the interpersonal role of figurehead, nine of Mintzberg's ten roles were used to classify at least one decision situation.

Managers also needed information to contribute to other managers' problem and decision situations. Some, particularly those at the junior leader level, needed information related to their current assigned area of responsibility to share with other managers. Congruent with other research (Detmer, 2000; Head, 1996), hybrid managers provided content related to their previous positions as clinicians Managers at more senior levels typically needed information to approve decisions and solutions passed upward to them (Simon, 1977).

7.2 How do health service managers approach getting the information they want or need?

These health service managers most often informed decisions through group oral information sharing in meetings. When information needed could not be acquired through organizational memory search as labelled by Mintzberg *et al.* (1976) these participants would engage in an active search either directly, or using a search intermediary.

The next part of this section examines the role of meetings in health service managers' work.

7.2.1 What is the role of meetings in these health service managers' work?

The First Interview Study findings included that participants informed complex decision situations with short time lines through meetings as a means for acquiring required information quickly from multiple perspectives. This approach appeared to be practical in a specialized and dynamic environment characterized by multiple conflicting priorities and frequently imposed deadlines.

The Calendar Study found an average of 257 meetings per month that these health service managers might be expected to attend, and identified a pattern of frequent meetings postponements and cancellations.

Second Interview Study participants said most of their time was spent in meetings; they participated in as many scheduled meetings of small informal groups as they did in groups that met regularly. The findings included that scheduled meetings of larger and heterogeneous

groups involved more information sharing activity, while meetings of smaller and homogenous groups involved more activity using information.

Participants commented on both the importance and value of meetings, and the burden meetings placed on them due to their number, the time they spent away from their departments and the workload meetings added to their departmental responsibilities. Although meetings appear to be the best way to move the organization forward, research that would lead to improved meeting effectiveness would benefit these health service managers.

7.2.2 What is the dominant information behaviour of these health service managers?

The results from this research suggested that using information was the dominant information behaviour of these health service managers overall. Further, as a means of acquiring information, information sharing was dominant over information seeking. These results also suggest that different information behaviours may be associated with different managerial levels.

The First Interview Study findings suggested these health service managers were more active in information sharing than information seeking, and that oral information sharing in groups was their preferred means of acquiring information to inform decisions.

Information transaction mapping in the Second Interview Study indicated that Using Information was the dominant behaviour overall, and that behaviours categorized as sharing Information were dominant over seeking Information (Figure 6-12). The findings suggested that there may be a relationship between information behaviours and organization chart level, group size and group heterogeneity. Examination of information transactions from smaller groups and groups that are more homogeneous showed more transactions involved using information, while larger groups and groups that are more heterogeneous showed more information-sharing activity (Figure 6-13 and Figure 6-14).

That information behaviours may be tied to organization chart level is suggested by the general reliance on positional information gatekeepers, in particular junior leaders, for being accountable for monitoring and sharing information relevant to their positions, including research information. Some participants who were Hybrid Managers described trying to keep up-to-date in their professional areas by monitoring the literature. Hybrid Directors who said they no longer tried to keep up in their professional areas described their own credibility as inadequate for information sharing. Some Directors and, to a lesser extent, Managers used search intermediaries to find information for them, while the role of some Directors, Senior Executive, and Board Members (volunteers from the community many of whom have full time jobs) was to approve decisions.

That information behaviour may be tied to manager's organization chart level challenges suggestions that decision-makers at higher levels should acquire critical appraisal skills (Gray and Ison, 2009). If the number of meetings suggests the number of decision situations potentially passed upward for approval, it would be unlikely that time available would allow individuals at higher levels to exhaustively search for and appraise research to support any decision that came to them for approval.

7.2.3 Is it possible to identify points during the decision-making process when specific kinds of information are typically needed?

Critical incident decisions explored in the First Interview Study played out over days, weeks and months while those explored in the Second Interview Study were resolved in a single meeting. In both studies, data about the information used to inform critical incidents was pooled for all participants and examined as a whole to investigate when information was used. The approach taken in the First Interview Study revealed examples of information activity at most key points in the four phase decision process. It was also possible to identify points where information-related activity did not take place.

When, in the Second Interview Study, mapped information transactions were examined by quartile, activity involving both internal and external information and all three categories of information was observed in all quartiles across the decision process. Congruent with research by Saunders and Jones (1990) and Treacy (1981), the findings from both studies suggest that information activity takes place throughout the decision process, not just at the beginning, middle or end, or at key points marked by beginning or end of decision phases.

The process these health service managers used to inform their decisions was not a linear process. As suggested by Simon (1977) "Each phase in making a particular decision is itself a complex decision-making process" and may contain other phases within it (p. 43).

Different categories and types of internal and external information were used throughout the decision process. There did not appear to be fixed or optimal points in the decision process that could be targeted with specific information, whether internal or external, a specific category or type, or from a specific perspective, such as population health.

7.2.4 Do health service managers appraise the information shared with them?

One of the researcher's assumptions was that health service managers appraise information for relevance, value and credibility before using it. The results suggested that in oral information sharing, both the information giver and the information receiver are actively involved in appraising the information being shared (Macdonald, 1998).

Decision-makers appeared to prejudge information for relevance by approaching only co-workers and contacts that they believed would have relevant information to share with them. They also limited the information that would be shared with them by focusing on a specific subject in a meeting situation. Those asked to share information would be unlikely to share information not relevant in that setting. Other results related to relevance were not conclusive.

The information giver assesses:

- The information they have to share for value and credibility;
- The information receiver for what they know and do not know;
- The information already accumulated for whether the information they have to share will make a difference;
- Their own credibility or fitness to share.

The manager, as information receiver and decision-maker, assesses:

- People as interpersonal information sources likely to have relevant information;
- The information identified as needed for value;
- The information shared for value;
- The information giver for credibility.

Participants in both interview studies were clear about judging information for credibility. When asked what they typically did in group situations, if they were uncertain about the credibility of information being shared, the common approach described was to gently but openly challenge the source. In situations where most present found the information credible but participants did not, they would search for information themselves after the meeting.

7.2.5 How do the information behaviours observed in these health service managers correspond with current models of Information behaviour?

Current LIS models created from studies of individual scholars and groups other than health service managers do not represent the information behaviour of these health service managers. The information behaviours of these health service managers do not reflect all of the behaviours

represented in OR/MS models developed from studies of managers working together to inform organizational decisions. Further, not all of these study participants' behaviours are reflected in these models.

With rare exceptions, these health service managers informed their critical incident decisions through group oral information sharing, gathering just enough information to make the decision without bridging all information gaps identified. These decisions encompassed a series of decision cycles rather than a single linear path so have not been well represented by established LIS models that appeared to represent individuals actively seeking information in a linear path, bridging gaps as they were encountered. Some of the LIS models, for example Wilson's 1996 model (Wilson and Walsh, 1996c), had feedback loops that might represent multiple information searches to meet a single need and featured intervening variables that presented barriers and challenges to the searcher. But these barriers and challenges did not completely capture the obstacles that these participants faced. These participants exhibited only two of the four search types named in Wilson's 1996 model. Their information practices including their selection of information sharing partners and their behaviours associated with appraising and using information are not represented.

The model that best represented the information behaviour of these health service managers was March's Thermostatic Satisficing Search (March, 2010; Cyert and March, 1963), reflecting Simon's theory of satisficing (1957) and March's thermostatic satisficing process (1994). In this search model, the search is thermostatic (turning off and on) with search targets as branch points considered sequentially that begin and end search behaviour rather than a series of alternatives compared at the same time. The search is local unless it is not successful, then it expands. The process is repeated until enough information is gathered for a good enough decision, or some other influence triggers an immediate decision. The search is active in the face of adversity; in a satisficing search, decision-makers are more likely to change the nature of their decision situation in order to ensure the best outcome possible than to select from an array of poor alternatives that will result in a poor outcome.

March's Thermostatic Satisficing Search has features not identified in these health service managers. For example search and decision rules were not obvious in these study participants' responses. Further, the researcher has looked for but has not identified search and decision rules in any routine health service work-related group decisions made outside this research project. More research would be necessary to determine whether these health service managers create and evaluate search and decision rules during their decision processes, as there was no evidence of these in this study.

Of the LIS models selected for inclusion in the literature review, Krikelas' (1983) model appeared most relevant. It represented these health service managers in that behaviours included information gathering and information giving and sources included internal and external, oral and recorded information. Less relevant aspects of Krikeles' model were its inclusion of information gathering without apparent immediate need, and its linear process without a feedback loop. Other LIS models focused on information seeking as the leading information behaviour; some were so general that they were open to interpretation in many different ways and most demonstrated how gaps were bridged, not left unmet.

There are computer games that include multiple actions that together contribute to an end. One that graphically represents the information behaviour of these health service managers in two dimensions is the 1993-1995 version of *The Incredible Machine* (Wikipedia, 2011) by Dynamix. The objective of the game is to accomplish a simple task with a series of everyday objects (candles, ropes and pulleys, electrical generators, even cats and mice) arranged in what Wikipedia describes as a "needlessly complex fashion". Wikipedia describes the game's challenge as follows: "The levels usually have some fixed objects that cannot be moved by the player, and so the only way to solve the puzzle is to carefully arrange the given objects around the fixed items." A challenge, for example, might be to put a soccer ball inside the box. To start, the player would have been presented with "given objects" as available tools (representing possible decision partners) at the bottom and some unmovable obstacles already in place that must be integrated into the sequence of events. The immovable objects in the game, for example lengths of pipe, represent decision influences (Figure 4-4), the four explicit subcategories (organizational values and organizational considerations, regulations and resources) and the less positive influences included in the cultural subcategories situational and environmental variables, including P/politics and buy-in.

Health services have been described as among the most complex of organizations to manage (Glouberman and Mintzberg, 2001b) and working around these "immovable obstacles" contributes to its complexity. There were no current LIS or OR/MS models identified that completely captured the information behaviour of these health service managers as described by in the following quotation from one participant who differentiated between managing health services and managing businesses in general.

> *…the health business, you call it a business, but a lot of it is moral, ethical judgment and that kind of thing -it is more than a business, it is a business to a certain extent and you do have to run it like a business to certain extent, but it isn't a total business. (Participant Group 3-C)*

7.3 What information do health service managers need and use?

These health service managers informed decisions by integrating and balancing over sixty different information types. These information types could be classified within a framework of

three broad categories, explicit, tacit and cultural, created from work by Choo (2006) and Polanyi (1966).

The next subsection addresses questions about whether a consistent order or value is attached to categories or types of information, and whether and how research information enters the health service organization.

7.3.1 Is a consistent value attached to specific types of information, such that some is critical and needed first, without which any decision cannot be made?

The findings from the Second Interview Study suggest that health service managers do not place a consistent shared value on types of information. However, findings from the card sorting exercise indicated that specific types of information were more frequently valued "need to know" than others. These included accountability; decision stakes (impact, ramifications); evidence based research; financial resources; organizational expectations; part of the manager's mandate; and quality and safety, including public safety, staff safety and environmental safety.

Understanding other departments was a noteworthy information gap in the First Interview Study, and one of the most frequently mentioned information types in the Second Interview Study. It was not included in the card sorting exercise so its value was not addressed.

Health service managers may not always be able to prejudge the value of information. Sometimes they need to request and consider information; then, as they balance the costs and benefits, re-assess and prioritize items of information with respect to other information available to determine what will most influence their decision.

Examination of mapped information transactions in the Second Interview Study also suggested that a series of mixes of different information categories and types are used to inform decisions. This is congruent with research that found information needs to be mixed with other information to be used (Macdonald, 1998). This study did not provide the level of detail to determine whether these health service managers needed to mix existing information with new information to bring about change (Macdonald, 1998).

When group decisions are informed by oral information sharing, the order in which information might be considered depends both on group members present and the information that has already been accumulated.

Participants in the First Interview Study described only searching for information they knew would make a difference. In critical incident discussion in the Second Interview Study, one participant described a group that initially considered the value of a certain information type so important

that they were unwilling to move forward without it. Then when it was accessed and weighed against the cumulative value of information already considered, the group dismissed it as not important. Another participant described a group being asked to provide information within a short time frame that they were certain would, when considered and weighed along with other information they knew was being considered and believed held greater value, would be dismissed as not important.

7.3.2 How does new research information enter the organization?

The literature has suggested that decisions in health services must be made with more consideration to research evidence (Gray and Ison, 2009). The findings of this three part research study suggest that although these health service managers do not search purposely for written research information to inform every decision, information from research enters the health organization by at least eight routes.

Mention of purposefully searching for research information was sparse in descriptions of critical incidents in both the First and the Second Interview Study. However, in responses to exploratory questions, most participants in both interview studies indicated that they did refer to needing and using research information. With only one exception, Second Interview Study participants identified research evidence as "need to know" in the card sorting exercise.

Participants, notably those at the Junior Leader level, and Hybrid Managers, mentioned the importance to them of monitoring research information in their areas and described searching purposefully for research information. That the District requests hundreds of literature searches and thousands of articles from journals through library services every year has been documented in search service logs maintained since 1984 (Valley Regional Hospital Library, 1984-1996, triDHA Library and Knowledge Management Services, 2000-2010).   These factors prompted a re-examination of passages indexed for information types in the transcripts of both studies. Eight routes were identified by which research enters the organization.

Figure 7-1 Three attempted models representing routes by which research informs health service managers' decisions

The researcher considered options for displaying these eight routes as a model and created three different models in the form of a cycle, a pyramid and a star chart (Figure 7-1). Of these, the star chart seemed most appropriate because it represented a relationship between a series of unrelated elements (the routes) and a core element (the decision). However, some of these routes were related. It appeared to the researcher that the relationship between these routes would best be represented by a street map where different streets could be used to reach a common destination. In such a model, some streets would be unrelated to each other while others might run parallel, intersect and then perhaps diverge or converge. A street map model showing the following eight different routes to a single destination would represent decision partners informing a decision and allow for additional routes or streets as they were identified.

The rest of this section describes the eight routes by which research information enters the organization.

Explicit information that guides practice includes research information.

Health service managers look first to explicit information including professional standards, legislation, policies, practice guidelines and similar information. Participants considered this content created externally to be "internal" information because it had been so well integrated into practice. If the creators of professional standards and other documents that include explicit information keep them up to date with current research evidence and make them available to the target audience, then health service managers will have considered research when faced with a decision.

Information gatekeepers monitor, synthesize, filter and give health service managers information, including research information

When a situation requiring a decision emerges, co-workers who might know something about it are typically asked to come together to discuss the situation and decide what to do, or they are consulted in sequence until enough information has been accumulated. Information gatekeepers included specialists registered or certified in specific subjects and recognized as subject experts, and hybrid managers, who kept up to date in subjects related to previous positions to maintain cognitive authority in a subject. These information gatekeepers monitored new research information in their areas and searched purposefully for it when they needed information that they did not have. Information gatekeepers included positional roles in which an employee was accountable for a subject area. These positions often spanned two or more portfolios, for example infection control, injury prevention, or occupational health.

Health managers compare experiences with and sometimes visit counterparts in other organizations

First Interview Study participants commented on the lack of published information relevant to rural Nova Scotia health services. As an alternative, if no one in an organization had the

information needed to inform a decision, these participants described asking a counterpart in another organization whether they encountered a similar issue and if they had what they had done about it. The researcher is aware of situations informed by visits where an individual or a group visited the more experienced site to see what to do and how to do it. If the more experienced contacts have synthesized and applied research information to their practice, then research informs the starting point for the novice group.

Working groups who identify a potential problem or opportunity divide and assign responsibility to check current research

When a health service manager identifies an issue as a potential problem or opportunity situation, they confer with several others. If as a group they do not have the information they need, they divide the subject into chunks and each retrieves and synthesizes information. Then they meet again to pool information and decide what to do. Members may search for information themselves or ask a librarian or other intermediary to search for them. When they make a decision, then summarize it for information or approval, information from research will be included.

Health workers and managers use conferences and workshops as a source of research information

When information needs coincide with conferences and workshops on the subject, health managers send someone to go and bring back what they can to inform the decision. More recently, when webinars and other online workshops are advertised that are relevant to an issue, health managers register on behalf of the organization, book a room and equipment, and invite others to come and hear about the subject, including the most recent research.

When health service managers cannot access the expertise they need internally, they ask government specialists or contract with external consultants.

Health managers have access to government specialists who support provincial legislation and regulations in various departments and will give advice on what to do in when situations arise that cannot be successfully resolved internally. When a particular situation requires skills not available in the District over the longer term, external consultants are contracted to study the situation and provide recommendations. Consultants from both government and the private sector are expected to be up to date on current research.

Health service managers communication situations, decisions in writing in the form of summaries that include one or two key references to recent relevant research

That organizational decisions are approved hierarchically has been recognized in organizations in general (Saunders and Jones, 1990; Simon, 1977) and in health services organizations (Glouberman and Mintzberg, 2001a). When decisions are passed upward for approval, they are

generally outlined as a one page Situation-Background-Analysis/Alternative-Recommendation (SBAR). These SBARS typically include references to one or two items of key relevant research.

Health service managers search the literature themselves or ask an intermediary to search for them.

Some participants mentioned asking librarians to search for them. Others consulted with the Medical Officer of Health, or other information intermediaries. Participants at the Junior Leader level described purposefully searching for information on a number of different subjects at any given time. As the manager of library services, the researcher is certain that at least some decisions are informed by research, because managers ask for information and library staff provides it, and the use of online databases through the corporate intranet is substantial and cannot be accounted for by library staff activity alone. For example, the statistics available from just one database provides evidence of five to six thousand searches from the three districts that the researcher's library serves each year.

7.4 What information issues and problems do health service managers face?

These health service managers described barriers and challenges to finding and using information effectively. Some of these challenges were related directly to their information or information behaviours while others included resource gaps (time, funding, skills, space, equipment), and situational and environmental cultural variables that kept them from moving forward to resolve a decision or solve a problem.

These health service managers faced in 2005-2008 challenges associated with poor data quality and inadequate information management infrastructure, similar to those reported by researchers who completed studies10-15 years ago in the United Kingdom, Poland and Botswana and more recently in the United States and South Africa (Kovner, 2005; Niedźwiedzka, 2003; Mbananga and Sekokotla, 2002; Moahi, 2000; Head, 1996).

Regardless of whether their workplace was publicly or privately funded, in a single or multi-site environment, in a computerized environment, or not, health service managers preferred to get information orally as a way to overcome barriers and challenges.

7.4.1 Why did these health service managers satisfice?

One of the objectives of the Second Interview Study was to determine why these health service managers satisfice, and whether and how they are challenged by inappropriate information quantity, and whether there was a relationship between the two.

Comments made by First Interview Study participants indicated they had inadequate information management support, and suggested they were challenged with both information overload and

information poverty. First Interview Study Participants satisficed; satisficing has been suggested as one coping strategy for information overload (Bawden and Robinson, 2009).

Second Interview Study participants were asked which they found was more of a challenge, not enough information or too much information. Most responded that they were challenged with both. One participant commented that too much information was never a challenge because when enough had been accumulated, the search stopped. This comment and re-examination of information transaction maps suggested that participants collected information to an information saturation point. They did not satisfice because their information management system was inadequate, or because they were coping with information poverty or information overload. They satisficed because the information they already acquired and considered held a cumulative value that outweighed the value of any remaining information identified initially as needed, but not yet accessed.

In chemistry, saturation is the point at which as substance can receive no more of another substance, such as when air becomes saturated with water and condensation begins. In qualitative data gathering, data saturation is the point at which new data gathered stops adding anything new to research results so the research stops. Information saturation has been discussed in the OR/MS literature (Saunders and Jones, 1990) but the researcher has not found a definition for the concept. Some LIS researchers have described a *search saturation point,* the point at which web searchers were able to achieve their search aims (Mansourian *et al. 2*008) and others appear to use *information saturation* interchangeably with information overload (Choo, 2002; Wilson, 2001). This research proposes a definition for information saturation point, discussed further in Chapter 8.

7.5 Chapter Conclusion

This chapter has examined and combined the findings from all three studies to address four main research questions and other questions associated with them that emerged over the course of this research.

One of the most important findings may be that health service managers do use research information to inform their decisions. Each decision is informed with multiple pieces of different categories and types of information that must be integrated and balanced.

A second important finding is that satisficing is an information behaviour that would be practiced regardless of information quantity. Informing health services decisions is not a linear process. Each decision is made up of a series of smaller decisions that contribute to it, each requiring one or more pieces of information. As the information to inform each of these accumulates, the point of information saturation is reached after which additional information, no matter what its initial

value, will not make a difference. Therefore, these health service managers practiced satisficing because they had enough information to make a decision rather than because they did not have the information they needed or because they had too much information to synthesize.

A third finding identified group oral information sharing as the dominant means by which health service managers acquire information. This behaviour was found to be both a benefit and a detriment to these managers. The manager as decision-maker benefited from bringing together information sharers with diverse perspectives and experiences who filtered the information they had for relevance and value before they shared it. The manager as information sharer suffered ineffective meeting processes, too-frequent absences from their office or department, frequently imposed deadlines, multiple simultaneous conflicting priorities and additional workload brought about by frequent group work.

The implications of these research results and study limitations are discussed in the next chapter, Chapter 8, Conclusions and Recommendations.

Chapter 8 Conclusions and Recommendations

8.1 Introduction

This research study has attempted to learn about information behaviour from a group of health service managers working in a rural, publicly funded health service in a multi-site, computerized and dynamic work environment. Information behaviour has not been explored in a similar group and setting. Underlying issues important internationally include rising health service costs and perceptions about the group's low use of health-related research, despite global investment in both research and research translation.

This chapter states the study conclusions, including research limitations and implications for practice, and makes several recommendations for further research. It begins with a brief research overview.

8.2 Research Overview

Following an extensive literature review, this research used a three-part approach to explore the information behaviour of health service managers as they informed critical decisions. The First Interview Study (n=19; conducted in 2005 with data analysis completed in 2006) used semi-structured interviews with critical incident questions and exploratory questions. The Calendar Study (completed in 2008) used documentary analysis in the form of meeting room calendar analysis and the Second Interview Study (n=17, conducted in 2008 with data analysis completed in 2009) used semi-structured interviews with critical incident and exploratory questions and a card-sorting exercise.

8.3 Main Study findings

This section examines and summarizes research findings with respect to the researcher's original beliefs and assumptions and with respect to the original general research questions.

8.3.1 Beliefs and Assumptions

This study was initially framed by one general belief and three specific assumptions the researcher held as a Manager of Library Services within the organization at the centre of the study. These are considered first in this section because they reflect the personal journey that this thesis study has been for this researcher. The general belief, that health service managers make decisions using some form of information, is upheld and supported.

The assumption that before health service managers use information, they assess it for relevance, value and credibility is supported with respect to oral information. Decision-makers prejudge relevance by selecting oral information sources for their likelihood of being able to provide relevant information. In a culture of oral information sharing, oral information is more likely to be assessed for relevance and value before it is shared, and at least partly assessed for credibility before it is shared. Decision-makers also assess oral information received for value and credibility after they receive it.

Whether and how written information, including publications obtained through an intermediary that include research information, would be assessed for relevance, value and credibility before being provided to and after being received by the decision-maker was less clear.

Two assumptions were not supported by this research. The first was that health service managers did not always have ready access to most of the information they need to support decisions, so were forced to make decisions with less information than they would prefer.   These health service managers made decisions when they had enough information to support them. In situations involving a crisis, they accumulated information until its value outweighed the value of information identified as needed, but not yet accessed, then made their decision. This same approach was one of three used in problem and opportunity situations where they also changed their decision to one they could make comfortably, or postponed the decision until they had enough information to make the decision comfortably.

The second assumption not supported was that if health service managers did have access to all of the information they needed, they would use it. These findings suggested they accessed and used only the information they needed, balancing administrative cost with a decision that met the situations' requirements. Further, where situations allowed, they made decisions that both resolved the immediate problem and made organizational progress beyond the immediate situation. Once their information needs had been met, they did not continue to access and use information simply because it existed.

8.3.2 Original Research Questions

This study began with the two research questions presented below. These have been answered with a summary of relevant research findings.

1) *What are the information needs and uses of health service managers, what are their information behaviours, and what are their barriers and challenges?*

The results that contribute to a response to this question are summarized under three headings: information needs, information categories and types, information behaviour, and barriers and challenges.

Information Needs

These health service managers worked in a dynamic and highly specialized environment that included frequent complex decision situations arising from their roles that were typical of managers in general. They tended to make decisions in groups using information shared orally to include multiple perspectives, so their approach to making decisions appears to be more similar to naturalistic decision-making than to other classic decision modes.

Information Categories and Types

Health service managers reported using over ninety (Table 6-13) different kinds of explicit, cultural and tacit information from both internal and external sources to inform their decisions.

Information Behaviours

These health service managers described six information behaviours: needing information, using information, seeking information, sharing information, managing information and appraising information. Other activities were recommending and approving action. Of these information behaviours, using information was dominant overall, with sharing information in second place overall. The results suggested a relationship between managerial level on the organization chart and information behaviour with managers at the lower end more active at gathering and synthesizing information and those at the higher end more active at approving information.

The key information sources were oral interpersonal sources in positional information gatekeeper roles mandated to oversee a specific field or subject. They monitored the literature and searched actively when needed to inform situations that required their perspective. They mixed research with tacit knowledge and knowledge of the immediate context. Before sharing information, they filter it for relevance, value and credibility so that they could provide information most likely to be immediately useful.

Meetings supported sharing of tacit information difficult to share in writing, and cultural information more likely to be shared orally. Each decision was informed with a series of mixes of information types until enough was accumulated to allow a comfortable decision.

New information, including research information, entered the organization through at least eight different routes. Faced with multiple conflicting priorities, Managers, Directors and members of Senior Executive appeared to first to rely on oral information sources and second on intermediaries to find information for them. This approach compensated for deficits in time, detailed knowledge of service areas managed and information search and appraisal skills.

Barriers and Challenges

The main information-related barrier identified was inadequate information management infrastructure, although this will improve with more recent introduction of province-wide systems for electronic patient records and for the business of health (finance and purchasing). However, there are still no records management guidelines governing unstructured corporate information from the beginning to the end of its lifecycle.

A second challenge relates to the frequency of imposed deadlines to share information and a third relates to meetings, seen as valuable and necessary but too frequent, and too often ineffective or lacking clear purpose.

A fourth challenge is associated with a lack of organized access to written documents that reflect the organization's rules and history, including policies and procedures, the management of which has improved over the course of this research, and meeting records. Participants' described their use of meeting records as primarily to identify and prompt action to be taken before the next meeting. Meeting records generally lack enough detail for new managers or anyone facing a decision to use to determine the course of earlier related work.

2) What information behaviour models best represent this group?

This question was listed among four that remained unanswered at the end of the First Interview Study. Chapter 7 included discussion of related findings from both Interview Studies beginning with a review of models that might represent the information sharing behaviour of this group. The findings of the Second Interview Study includes activities within information sharing related to appraising information and mixing different types of information that would be difficult to represent in a linear model.

A model might be constructed to show a single information transaction as one of a series of transactions involving seeking, appraising and sharing on the part of the information giver, with or without an intermediary, with appraising and using information on the part of the information receiver.

The researcher's conceptualization of these behaviours included models consisting of different streets that lead to a single destination and a computer game where multiple strategies are used

to overcome fixed obstacles in reaching a goal. Further research is needed to determine useful information behaviour models, perhaps three dimensional models that would best represent these health service managers.

8.4 Original Contribution to Existing Research

This work contributes to existing information behaviour research related to managers. It suggests an approach for documentary analysis of electronic calendars and it defines or expands on definitions of several information behaviour concepts that may be useful to other LIS researchers.

This section begins with a summary of the contribution this research makes to understanding managers' information behaviour.

8.4.1 Information Behaviour of Health Service Managers

This research explained satisficing as a common sense and timely approach to decision-making using "just enough" accumulated information. It demonstrated that decisions, including lower level operational decisions, were effectively informed by multiple categories and types of information shared orally and considered throughout the decision process.

This study identified eight ways that managers acquire health research to inform decisions, and suggested that they favoured health research blended with experience and expertise to inform their decisions over primary research in its pure form. This is a new perspective on this group that may be useful to researchers and research funders concerned that their work is not being applied to practice.

Further, the effectiveness of the frameworks from OR/MS used in data analysis suggests that these results might also be transferable to managers in general, particularly with respect to workplace environment, managerial roles, informing decisions, nature and purpose of meetings, and response to challenges presented by inappropriate information quantity and information management infrastructure. Application of this research to other areas has been discussed further in Section 8.5 below.

8.4.2 The Nature and Purpose of Meetings

These results also suggested that these health service managers spend a large amount of work time sharing and using information to inform decisions. Results contribute to the literature on scheduled and unscheduled meetings by describing the scheduled small group single issue meeting. Further research is needed to identify ways to overcome workplace challenges, such as the burden of too-frequent meetings, the disruption of frequently cancelled and postponed meetings and meetings lacking clear purpose.

8.4.3 Positional Information Gatekeepers

This research used "Junior Leader" as a convenience label for employees charged with responsibility for leading a specific service or program but without accountability for budget or staff. Junior Leaders and hybrid managers (clinical professionals who later became managers) developed and maintained a general knowledge of the organization, an in-depth knowledge of their own area and monitored related research. Other managers frequently engaged them in decision-making, expecting they would

Bring their existing unique perspective, experience and expertise to decisions

Act as information intermediary to search for, filter and synthesize new research information so it could be more easily absorbed to inform specific decisions.

The results of this research relating to positional information gatekeepers may suggest a different focus for proponents of evidence based health services management, that is, to identify and support different behaviours at different levels within the organizational chart, perhaps using effective strategies such as targeted messaging (Dobbins *et al. 2*007b).

This research also suggests new roles for both health librarians with respect to designing new services to support positional information gatekeepers. Given the number of decisions and meetings in which these managers were expected to engage, and that they needed and used information throughout their decision processes, research into collaborative partnerships between information intermediaries such as knowledge brokers or librarians and positional information gatekeepers would be useful.

8.4.4 Documentary Analysis Methods for Electronic Calendars

An extensive search of the literature did not identify previous research involving documentary analysis of print or electronic calendars. This research has established an approach for conducting a study of electronic calendars as a form of documentary analysis that may be useful to other researchers.

8.4.5 Contribution to LIS Concepts

This research proposes definitions for concepts discussed in the LIS literature for which definitions have not been identified. This subsection provides these definitions which may be useful to other LIS researchers.

Situational Variables and Environmental Variables

This research identifies and provides new definitions for two subcategories of cultural information used to inform decisions. The shared definition for these from the psychological literature is

"External influences on behaviour" (American Psychological Association, 2011). It builds on this definition and use in one information behaviour article (Mick, 1980).

Situational variables: information on temporary conditions that might apply to only one decision situation; "decision weather". Examples of situational variables are buy-in, level of controversy, conflict of interest, and imposed deadlines.

Environmental variables: information on conditions of a longer duration and more general in nature; they might apply to any situation within the department, portfolio or district; "decision climate". Examples of environmental variables are P/politics, power, experience, expertise, and related decisions.

Information Saturation Point

This research proposes a definition for Information Saturation Point congruent with Simon's satisficing theory (1956) where satisficing is a best administrative practice rather than a coping mechanism for inappropriate information quantity (Bawden and Robinson, 2009) or a negative information practice related to information avoidance similar to Mooers' Law (Mooers and Mooers, 1996) or Zipf's Law (Poole, 1985).

Information Saturation Point: The *information saturation point* is reached when enough information of different types are gathered so that any additional information, including information initially identified as "need to know" will not make a difference against the weight or importance of the information that has been accumulated.

Information Transactions

Computer information transactions have been defined with respect to intangible digital goods such as computer software, online databases and other information resources (Gatten, 2002) and the concept of information transaction as used in web analytics is generally understood (U.S. Department of Energy, OSTI Blog, 2009). Researchers (Huizing and Bouman, 2002; Choo, 1993; Daft and Lengel, 1986) have used the words "information transaction" and "information transaction space but the concept was not included in a list of definitions compiled for the American Library Association (Rabner and Lorimer, 2002). The literature review conducted for this study did not identify a definition for the concept. The following working definition created for this study is proposed as a new definition for this concept:

Information transaction: A specific input or a stimulus, one or more information behaviours, one or more items of information, and an information output or response. The *stimulus* is the identified information need that initiated the transaction; the *response* is the outcome of the information transaction. The information behaviour at the centre of the transaction is the action

with respect to the information and may include needing information, using information, sharing information, seeking information, managing information and approving information.

Invisible information

This research has determined that health service managers prejudge the value of some information, looking only for information they believe will make a difference. The following definition is proposed for a new concept, "invisible information".

Invisible information involves information initially considered "need to know" before it is accessed to inform a decision, but then once accessed and considered is dismissed as "not important", and so not considered to be a factor that influenced the decision. An example of *invisible* "need to know" information might be the number of people with a specific terminal, but easily preventable, disease in a community. Decision-makers might initially consider this information so important that they will not move forward without it. Then once accessed, may realize their decision will be the same whether one hundred people have the preventable condition or just one. There is a resource cost associated with accessing invisible information as decision-makers may not be willing to move forward without it. Once accessed and judged "not important", invisible information is less likely to be included in records associated with the decision that information that did factor in the decision.

8.5 Study Limitations

A main limitation of this research related to the sample, both its size and the fact that participants were drawn from a single organization. There were 36 (19 + 17) health service managers from one organization. The group was nearly homogenous with respect to age, education, and career years. As it was a qualitative interview study, it was not intended to be representative of all health service managers or managers in general, rather that the findings might be transferable to similar groups in similar situations (Mason, 2002). The information behaviours and challenges of these health service managers were found to be very similar to those identified in research conducted of health service managers working in the United States, South Africa, Botswana, Poland, and the United Kingdom with and without the benefit of computers or access to the internet. The findings from this study should be transferable to these other groups and to health service managers from any developed country with an established health care system.

Other limitations may be associated with the researcher's dual role of investigator while also employed full time in the organization. As a fellow manager and manager of the participants' library service the researcher occasionally had difficulty disengaging from the subject matter especially if the critical incident was one in which she had been directly involved.

An additional, related limitation may have been social desirability bias (Edwards, 1957) exhibited through participants' reluctance to admit that they did not purposefully search for and use research evidence or any evidence at all to support critical decisions. However, this did not appear to be a factor that influenced participants. Their direct reference to research evidence was sparse.

8.5.1 Reflections on the First Interview Study

Other than the two limitations just noted, the main limitation of the First Interview Study was that the researcher designed the study to capture information seeking behaviour of published research with respect to an individual manager's critical incident decision, and instead gathered information about oral information sharing behaviour associated with a group critical incident decision. This affects the findings in that the interview questions prepared were designed to explore a practice and information behaviour that occurs less frequently. It was not until data were almost completely analyzed and the researcher could look back over the entire study that this became apparent.

Had the study been designed to investigate information sharing behaviour from the beginning, or alternatively to investigate one of the other information behaviours, for example indentifying information needs, the results may have been more useful. For example, an information behaviour study might have begun with the Calendar Study, completed the Second Interview Study on the Role of Meetings in Information Sharing as the Main Study and then included a series of meeting observations as the Follow-up Study that could then have generated data that reflected what actually happened. This then could have been analyzed quantitatively for more meaningful results than the current Second Interview Study, which used descriptions of what happened from participants' memories.

A second, less important limitation of the First Interview Study might have been including two subgroups in the sample: board members instead of just managers, and managers who worked for three Districts, instead of just one. Including these complicated participant selection for literal replication (predicted similarities) and theoretical replication (predicted differences) without benefit.

8.5.2 Reflections on the Calendar Study

As data from the twenty meeting rooms were incorporated and standardized, inconsistencies in calendaring that affect the quality of the data were observed. These included lack of standardization of group names. In addition, many of those who arranged meetings used the calendar to book the meeting room but not to engage participants' calendars, so it was not possible to determine who participated. Had this content been included, it might have been

possible to use social network software to graphically represent the meetings instead of just counts by time and date.

The literature on meetings considers scheduled meetings vs. unscheduled meetings. Calendar study data were incomplete in that they did not include unscheduled meetings or scheduled meetings in managers' offices, in departmental meeting rooms, by videoconferencing and by phone. This affected the study results in that it quantified only some of the meetings that managers were expected to attend. The researcher attempted to compensate for this by including several exploratory questions in the Second Interview Study to gather data from participants about the role, number and nature of meetings in their work routines.

Although it is likely that similar calendaring inconsistencies would occur, an alternative to studying twenty meeting room calendars might have been to use the same methods to study the electronic calendars of the Second Interview Study participants.

8.5.3 Reflections on the Second Interview Study

As the data gathering method, though interviews were least intrusive to participants, this method was a limitation in the Second Interview Study. Data gathered through meeting observations in laboratory facilities designed to study groups equipped with instruments for sound and visual recording, eye tracking, note taking and white board capture would have gathered more complete and accurate data.

When asked to describe a meeting that went particularly well, where decisions were made about critical incidents, details of information shared were recalled from memory and not from meeting records or notes. Participants described not only the information they shared that was important to them but also the information that others shared that influenced the decision. Although these participants were skilled at sharing information orally, response bias may have been a limitation in the Second Interview Study if participants recalled information that they contributed themselves, agreed with, or supported and not information others contributed or information that they disagreed with or did not support.

This potential response bias was less of a concern in the First Interview Study where participants were asked to provide an individual perspective and describe the information that influenced their decision.

There are limitations associated with analyzing and reporting qualitative data quantitatively. One of these is that the researcher was unable to find clear directions for carrying out this type of analysis. The approach to mapping information transactions was devised for this study so has not been tested or reviewed outside this study. A second limitation associated with mapping information transactions is that incomplete or inaccurate data would decrease how conclusions

drawn from the mapping process were able to reflect actual events. Transaction maps were subjective and may have been incomplete for several reasons. Classification of information and information behaviours depended extensively on the researcher's experience with the organization. Participants described information shared with the group without identifying who shared it. Information and information behaviours could not be examined with respect to the position level of the manager who contributed it.

As noted above, had the researcher already had the benefit of the Second Interview Study Results to guide study design, meeting observations in instrumented laboratory facilities designed for group study would have been a more accurate means of gathering data. Other methods, such as participant observation or documentary analysis of meeting minutes review may have been a more accurate, complete and unbiased means of finding out about the information behaviour of health service managers. Participant observations were judged not to be practical because of the number of information transactions these managers experience daily; observation would have entailed obtaining agreement of consent from numerous staff and patients. Meeting minutes were not always available.

In the Second Interview Study, exploratory questions were asked and answered. Because it was meant to be a smaller, follow-up study, shorter interview appointments were booked. If time did not allow for exploration of additional issues of possible interest, these were not explored. Exploratory questions were asked after discussion of the critical incident meeting discussion, and before the card sorting exercise, time permitting. When appointments did not start on time, or if participants took longer than expected describe critical incident meetings, exploratory questions were sacrificed so the Card Sorting Exercise could be completed.

8.5.4 Reflections on the Card Sorting Exercise

The Card Sorting Exercise had several limitations. First, it included only information types either mentioned by the First Interview Study participants or anticipated by the researcher in the proposal stage. Second Interview Study participants mentioned additional information types not included in the exercise.

A related limitation was that information types identified as information gaps in the First Interview Study were not included in the card sorting exercise. Participants in this Second Interview Study mentioned information types they needed and used that First Interview Study participants only mentioned as information gaps, for example, "understanding other departments".

A third limitation was that the card sorting exercise had no means to compensate for rater bias. Some participants rated many or all information at the high end of the value scale as "need to know". It was not possible to determine whether this was a ceiling effect or an accurate reflection

of their perspective. In hindsight, a better approach would have been to mirror the real world more closely, where time and other resources are limited by allowing a maximum number of "need to know" choices.   Such a limit was only imposed in the second series of four interviews but results were too few to be conclusive, so have not been discussed in this thesis.

8.6 Implications for Policy and Practice

This research has implications for health organizations as a whole, for library services, and for agencies that fund research and research publishers.

8.6.1 Policies and standards for meetings and minute taking

Given the amount of time spent in meetings and the subsequent number of decisions made in meetings, policies and standards should exist to guide meeting processes. These could be supported with encouragement and training on meeting facilitation and on group norms for both chairpersons and participants, and more effective minute taking for both scheduled formal and small group meetings.

Although participants were asked to describe particularly effective meetings, most made comments about attending meetings called without a clear purpose and general meeting ineffectiveness. Meeting purpose and expected outcomes should be made explicit in meeting invitations. Guidelines for meeting participation and minutes such as those established by Mina (2002) and training programs for meeting chairs, facilitators and participants might be used to increase meeting effectiveness. The importance of understanding other departments in decision-making may make health service managers more comfortable about taking time to attend information sharing meetings.

Meeting Minutes Need More Timely Distribution

Some participants said they relied on meeting minutes to prompt action before the next meeting. While others said minutes were often not available until the next meeting, or they did not have time to review meeting minutes. A standard approach might involve lists of action items following meetings, and a brief review of group activities at the beginning of each meeting.

Small Group Meetings Need Minutes Too

Although participants described more information activity in smaller groups (Figure 6-13) and more information transactions took place where information was used and shared in these than in meetings of larger groups, no participant said that there were shared records of small group discussions and decisions. Some members said they took their own notes of small group meeting discussions but no one claimed to share these with others involved in discussion (Mina, 2004).

8.6.2 Implications for Health Library Services

This research has implications for health service librarians as well as for instructors of programs educating future health service librarians, and may have implications for library services beyond health services.

One of the most important observations made during this research is that resources and services developed to meet information needs of academics do not necessarily meet health service workers' needs. Health service librarians must continuously engage with clients to understand their workplace information needs generally and specifically. Instructors teaching students about health library services need to stress the importance of understanding workplace needs and continuous client engagement. An abbreviated critical incident technique can be used effectively in an organization wide corporate information audit or as a script for engaging individually with clients to understand workplace situations, challenges and needs.

There is a need for health service librarians to understand decision processes, and how information is accessed to inform them. It is useful to know be able to compare the steps in evidence based clinical practice with those in rational decision-making, and understand the limitations of each and realize that decisions are unlikely to be independent linear processes informed by a single piece of written research information.

In designing services for health services workers, health librarians need to be cognisant of different roles, including those of managers, clinicians, boundary spanners and information gatekeepers. There are differences in needs of clients involved in acute care, community health, continuing care, medicine and operations, and in clients with different backgrounds, at different career stages and at different levels on the organization chart.

Information products and services tailored to meet specific workplace situations and specific client perspectives are more likely to meet client needs than a "one size fits all" approach. Services might include training in current awareness services, and document creation, and might also include support for knowledge translation, perhaps through e-learning creation, administration of learning management systems, service evaluation, and innovative ways to communicate and share content such as targeted messaging or video reports or posters.

The physical walls and boundaries of traditional health service libraries have been changing as electronic content replaces print and information becomes more disposable than durable. Research must be integrated into organizational dashboards to appear alongside utilization, financial and other types of information rather than segregated and considered a separate task to be completed only some of the time. There is a need to balance expenditures for "just in case" collections with "just in time" access and realize comparisons are being drawn between the value, for example, of library services and cleaning or nursing services.

There is a need to bring librarians' skills to health information projects traditionally outside the purview of health service librarians. Librarians must investigate ways to extend their skills beyond the library walls, particularly those related to creation and storage of corporate information, data and field terminology standardization. One way to do this is to embed librarians in office suites rather than in libraries. Another is to actively seek out involvement in projects and committees that handle large volumes of information and work on these as colleagues to proactively share and translate information management skills.

This section has summarized areas where the researcher, as both a library service manager and an instructor of student librarians has used these thesis findings to change practice over the course of this thesis work. The next section addresses implications for researchers and research publishers.

8.6.3 Implications for Publishers and Researchers

Managers reported difficulty in purposefully searching for and appraising research to inform their decisions and in monitoring the literature in their area. Publishers and databases have introduced means to simplify and streamline subject current awareness and tables of contents services. Although some but not all journals suggest authors note implications for practice, this is not yet required as part of structured abstracts or included as a field in the Medline record. If implications for practice were to include fields noting relevance to specific professions and/or health service departments, and these were added to structured abstracts and database records, they might be used in targeted messaging or in RSS (Really Simple Syndication) alerts.

8.7 Recommendations for Further Research

Recommendations for further research are presented in four areas: information, positional information gatekeepers, meeting effectiveness and decision records.

Information

One of the Second Interview Study research objectives was to explore whether some categories or types of information are typically needed early in the decision process and other categories or types are considered only after these. The Second Interview Study found internal and external information, together with each of the three categories of information, mentioned throughout the decision process (Figure 6-12).

Further research in the form of meeting observations would be useful to determine whether these results accurately reflect health service managers' practices. Should this finding be disproved, knowing when each type of information may be needed may be useful to those providing information and information services to health service managers.

Research on information needs and preferences of new hybrid and new career managers to design information management and delivery systems for them in anticipation of the current cohort of "baby boomer" health service managers' retirement (Figure 1-2) would be prudent.

Positional Information Gatekeepers

Research identified to date on the role of the information gatekeeper, opinion leader, boundary spanner, and knowledge broker describes the roles of these in one-way information-sharing activities, translating research and giving news, opinions and advice. Researchers have noted that experts and novices have different information needs (Grant, *et al.* 2004; McKibbon *et al*. 2002). As information sharers, new positional information gatekeepers might be studied to determine whether they have additional or different information needs and behaviours than their more experienced counterparts.

Meeting Effectiveness

It may be useful to explore the differences between scheduled small and large group meetings to determine what contributes to the effectiveness of each. It would be useful to know whether systematic application of project management principles such as firm beginning and end times, clear roles and responsibilities and expected outcomes might contribute to meeting effectiveness.

Recording Some Decisions as Policy

There is also a need for research on strategic, tactical and operational decisions made in health service organizations. These could be explored with respect to their likelihood of recurrence, the amount of information used to inform them and decision-makers' difficulty accessing the information they initially identify as needed. This might suggest which decisions to record in writing as policy with information used to inform the decision recorded. Such a study might consider whether recording decisions might result in cost savings for the organization or reduced stress for managers with decreased need to meet for information-sharing and decision-making processes.

It would also be of interest to explore frequency of recurrence of decision situations across multiple health service organizations. This could be used to determine cost effectiveness of recording decisions in a standardized way, perhaps as policies or procedures to achieve economies of scale in terms of collective group effort.

8.8 Chapter Conclusion

This research has explored the workplace situations that cause health service managers to realize they need information, and then investigated what these managers do about their information needs.

The research findings indicate that health service managers function in roles typical of managers in general. They work in a hierarchical structure in which decisions are made and forwarded upward for approval. Their approach is expected to be business-like but their decisions are influenced by numerous factors beyond their control including politics and public opinion. Their workplaces can be characterized as dynamic environments that lack an adequate information management infrastructure. They meet immediate information needs using oral information sharing as a preferred means of acquiring information. However that decision situations are not supported with written information results in meeting frequencies that are a burden to most managers

This research questions common perceptions that health managers make decisions without using research. It identified eight ways in which new research enters health organizations, including through information intermediaries such as positional information gatekeepers as alternatives to formal provision of research evidence by library services or knowledge brokers. Furthermore it suggests that, contrary to much of the published literature on evidence based health services management and evidence informed decision-making, health service managers do indeed use research.

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Appendix A. Case Study Protocol

Guide for semi-structured interviews for an exploratory study[1]

1   Overview of the case study project

1.1   Project Objectives

To understand the information needs of those involved in planning and managing healthcare, it is necessary to understand their decision situations, work role tasks, information seeking and source preferences, and the barriers and challenges they face in information access and use.

For this research, the purpose of semi-structured interview is to gather information on members of the study group – what/why/how/whether they

- *considered the problem or issue in advance*
  - *formulated a question in their mind*
  - *considered the PH framework in their search*
- approached the search for information
- found anything useful & if they did, what it was and where they got it
- problems/challenges encountered
- information intermediaries used
- information they recognized that would like to have had but didn't
- computer literacy issues
- information literacy issues (including: if they didn't find the information, whether they recognized why – because it doesn't exist, or because their search approach was not what it should be)
- information seeking style

1.2 Auspices

University of Sheffield Department of Information Studies Centre for Health Information Management

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[1] This is the original draft

1.3 Case study issues

- Information Needs and Uses
- Decision Making
- Information Seeking and Sources
- Information Models
- Information Types and Flow
- Information Quality and Quantity
- Information Literacy and Population Health Knowledge

1.4 Checklist of expected sources

- Published health research
  - Practice guidelines (evidence based)
  - Journal articles (evidence based)
  - Medical texts
- Practice standards
  - National health care service standards
  - Internal procedures, DHA practice guidelines
- Laws & regulations related to health
  - Provincial
  - National
- Healthcare system utilization data
  - demand for services by
    - Age
    - Sex
    - postal code
    - referral source
- Comparisons with other healthcare systems
  - Descriptions of services
  - Recognized best practices models
  - benchmarking information
- Demographic information
  - Population tables, age (5 year intervals) and sex, by municipally incorporated unit
  - population base maps
  - population projections
- Epidemiological Information
  - Health charities
  - Government
    - Local
    - Provincial
    - National
    - North American

- Expert opinion
  - Local input from
    - Physicians
    - DHA managers/opinion leaders
    - Other health care professionals
  - Practice guidelines (opinion based)
- "Jurisdictional" information (="Whose job is it anyway?") re: existing related programs and services
  - Publicly funded
  - Private sector
  - Provincial planning documents
- Related community organizations – volunteer, self-help, health charities
  - AVH CHB Directory
  - Interest, mandate, programs and services
- Financial information
  - current budget info
  - past investment and ROI
  - economic evaluation
- Internal documents
  - Meeting minutes
  - Presentations
  - Reports
  - Strategic plans
  - Newsletters
  - Policies & procedures
- Public opinion
  - Local needs assessments
  - Community health plans
  - Local economic development plans and reports

Community opinion leaders & local politicians

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2. Field Procedures

2.1 Entry strategy

With respect to conducting this research within Annapolis Valley Health with the Manager of Health Promotion who suggested that the study be conducted with respect to population health information, perhaps in conjunction with the AVH Population Health Working Group, led by the Vice President of Community Health. Discussion first with the Vice President of Community Health and then the Committee led to development of a series of population health questions.

First, the CEO of Annapolis Valley Health was approached and approval was requested. Then the application process to the Annapolis Valley Health Ethics Committee to conduct a study was completed and approved.

Participants will be contacted by email with an explanation of the research and the interview process and asked if they would consent to an interview.

2.2 Participant selection

Participants in phase 1 of this study were active information users drawn from a pool of Annapolis Valley Health paid and volunteer health care managers and decision makers.

AVH is a publicly-funded rural healthcare authority serving 80,000 people with five healthcare centres, 125 medical staff, 73 Board members and 1,375 employees, including the

In our hierarchy, a leader reports to a manager who reports to a director who reports to a Vice President who reports to the CEO. The CEO reports to a volunteer Governance Board as do advisory Community Health Boards. The CEO and now four Vice Presidents who head the portfolios of acute care, community health or operations are Senior Executive. Some directors and managers interviewed work just for one District Health Authority; others like me are shared by three.

At the beginning of the study period, there were approximately sixty-one members of the Annapolis Valley Health Leadership Forum, and seventy-two volunteer Board members, twelve on the District Health Authority Governance Board, and on each of five community health advisory boards.

An AVH Leadership Forum meeting agenda distribution list was classified first by portfolio and then by position level. I sorted these first into twenty-four groups and then into fourteen groups to develop a participant list from paid healthcare managers and decision makers. Two Board members were also interviewed, one from the governance board and one from the advisory board.

2.3 Interview Request (sent by e-mail)

I am wondering if you would let me interview you for my research.   The interview would take just under an hour of your time.

My study is of the information uses and needs of healthcare decision makers, their preferences about information types and information sources and the challenges they face in finding information. The purpose of these interviews is to identify as many different experiences and approaches as possible. This is for an "information studies/information management" program so is not limited to the information library services generally handles.

The semi-structured interview question set uses critical incident technique - debriefing - to focus discussion. I will ask you to think of a on a recent action or decision where you needed or used information and most of our interview will focus on that.

Interviews will be audio-taped. Participant responses will be confidential and analyzed and reported anonymously. Responses will be analyzed – transcribed, broken into concepts, entered into a database for storage and retrieval, then coded and themed – and then considered in constructing a questionnaire that I hope to have all AVH

Appendix A. Case Study Protocol

Leadership Forum members complete. No one else will have access to the tapes. They will be stored in a secure place, then destroyed when my thesis has been completed.

A short demographic questionnaire is used to gather general information on participants.

If you would allow this interview and have time to see me from [date range], that would be wonderful.

I have included some additional information below. With thanks for considering this, either way

Jackie

Background:

About my Research: This health information management study will lead to a PhD from the University of Sheffield Department of Information Studies . I have two supervisors, one from Information Studies and one from the Faculty of Medicine School of Health and Related Research The title is "The use of information by health care planners operating within a population health framework in the Annapolis Valley, Nova Scotia, Canada".

Ethics Approval: The research has received ethics approval from the AVH Ethics Committee. Interviews and questionnaires will follow AVH Ethics Committee Guidelines and use AVH consent forms.

Interviewee selection: I have identified 14 different groups of AVH decision makers and am working through these one by one, continuing to interview until I find I am not getting any new information.

Critical incident technique: a standard approach to debriefing for research and workplace practice.

Semi-structured interviews use a standard question set to guide interviews but deviating from these to follow up discussion points is encouraged.

Research on health care decision makers: This is an understudied group – the Canadian Health Services Research Foundation is looking at synthesis knowledge brokering solution, C. Mitton has been doing research in western Canada related to healthcare decision makers' use of evidence; a series of essays in Healthcare Papers 2002 3(3) and there are several books on health information management and using knowledge and evidence in healthcare that don't overlap; There are an increasing number of commercial products available designed to provide information to support healthcare decision making - but I have not identified any studies of the information decision makers do use now, the barriers they face in finding information to support decisions, or on the kinds of information they need and use.

2.4 Interview Materials

Interview materials will include the AVH Ethics Committee consent and anonymity form, the demographic questionnaire, an envelope to seal the cassette with the consent form, demographic questionnaire, and a clip board containing the warm up exercise, and the question set. An interview evaluation form was used with the pilot interviews. Other materials include additional batteries and an extension cord and an electric tape recorder with battery backup that uses 45 minute cassettes will be used to tape interviews.

2.5 Interview Procedures

The interview process will include the following introductory remarks.

Welcome
- Thank you for agreeing to participate in this study
- This point of these interviews is to gather information to help identify as many study points as possible.
- You have been asked because your point of view is important
- I know you have many demands on your time, and appreciate your willingness to fit me into your schedule
- This discussion is not a test; there is no right or wrong answers.
- I am interested in what you think and feel about how information is made available to help you in your work.

Introduction (if needed)
- I am Jackie MacDonald and I am a PhD student in the information studies department at the University of Sheffield
- I have been a librarian with the western Nova Scotia healthcare system since 1995.

- Before that, I worked a Health Sciences Librarian at Dalhousie University and University of Saskatchewan and as a Science Librarian at Acadia University.
- I am interested in speaking to you in your role as a health care planner and decision maker.
- The purpose of this discussion is to determine your ideas and opinions and experiences with searching for and using information.

Anonymity
- I would like to assure you that the discussion will be anonymous.
- In any publications that arise from this interview or any other parts of the research study, no data tabulated will be published unless it is more than 10. That means that unless there are ten identical answers for any question, responses will not be reported.
- The AVH Ethics Committee consent form explains some of their rules and guidelines for research studies. I have signed it assuring you of anonymity.
- Before we begin, I would like us to review the form and then I will ask you to sign it.
- I have just started a tape that is recording me speaking.
- I would like to continue running this tape to record the whole discussion.
- Do I have your permission to tape the discussion as a memory aid in recalling our discussion?
- The audio tapes will be transcribed later from tape to paper.
- The transcription of this interview will record your participant number, not your name, so you will be anonymous.
- The tapes will then be kept safely in a locked drawer.
- If you would sign the consent form indicating you will participate in this study by allowing me to interview you, and allow me to tape the conversation, I will be grateful.
- If you have something confidential to say that you do not want recorded, I will turn the tape off. Just let me know.

[give interview participants the consent and anonymity form to sign]

Process
- I have a series of topics and associated questions that I will ask you.
- Each question has prompts that might help you think of a response.
- These topics, questions and prompts are on a series of cards.
- If your experiences take us in a different direction, that is fine, then we may not use these cards.
- I will put the cards to the side as we cover the topics.
- There are no right answers or wrong answers to the questions.
- I will make some notes as we go to help remind me of the topics we cover.
- I am interested in your point of view and in hearing about your experiences.
- Finally, because of limited time, I may need to re-direct our discussion with a few questions.

[ask participants if they have any questions about what has been said]

OK, let's begin.

3 Outline of case study report

The case study report integrates results with discussion. Findings are supported with quotations from participants or references to other research literature.
3.1 Issue or problem being studied
3.2 Review of relevant literature
3.3 Methods used
3.4 Findings from the data collected and analyzed
3.5 Conclusions and implications from the findings.

4 Interviews

4.1 Warm-up Question

I am going to describe a case study and ask you to think about it as if you were involved.

Mold and fungus growing in the walls and ceiling of the elementary school in your community have made some children sick. The air quality consultant has recommended demolition or massive renovation. There are no funds to renovate the School, and it is not scheduled to be replaced until 2015. The School Board's solution is to close the school immediately and bus the children to the new, half empty elementary school in the next county, 35 minutes away.

Perhaps in part because your neighbours know you work with AVH, you have been asked to attend a meeting tomorrow night and give your opinion on what should be done.

Let's take about 5 minutes and explore your reaction to this problem as if it were real.

1. Given this situation, what would be your main concern?
2. What questions would you ask yourself?
3. Can you tell me what you might do first?
4. What information would you want to have?
5. Where would you get/look for that information?
6. Would you have that information on hand?
7. What else would you need?
8. Why would you select [that source]?
9. If you decided to ask a specific individual for information, why would you go to that person?
10. We've been considering one aspect of the problem. Can you think of any other problems identified in the case study we've just discussed?
11. Would you choose to address any of these in your discussion at the meeting?

4.2 Interview Questions

Now that we have considered decision making in a population health issue, I would like you to think about a recent instance in your current job/role with AVH where you had to think about a situation and come to a decision, either on your own or with others. When you answer these questions, I would like you to think about the thought and action processes you followed in this instance. I will also ask you some questions about how you go about looking for information in general.

Can you tell me about a situation [that has happened within the past ___ weeks/ months]? *(need to search for relevance of time)*

Background		
1. How did it come about?	What prompted it?	
	Who else was involved?	
	Was anyone else consulted?	Did anyone suggest consulting with anyone else?
2. What did you do?	Did you rely entirely on that?	Were there other approaches considered?
	Did you ask yourself any questions?	If you asked yourself question(s), what did you ask yourself first?
		Were you able to answer it/them?

		What could you not answer?
	Did you look for any information to help make your decision?	What information did you feel you needed?
		What specific kinds of information did you want?
		How did you determine what kind of information you wanted?
		When did you determine what information you wanted?
3. If you used any information to help make your decision where did you get it?	Was it provided to you the time	If someone provided the information you needed to you at the time, who was that? Was having the information given to you without you having had to ask for it acceptable to you?
	Did you have it already?	Do you remember **where** you got that information? Do you remember **when** you got that information?
	Did you have to look for it?	
4. If you used information that you were given or had already, what did you use, in terms of specific kinds of information	Was it internal AVH information?	What?
	Was it external information, journals articles or reports published by other organizations?	What?
5. If you didn't have the information you knew you needed, where did you go first?	Did you approach another person? Who was that?	Did you ask a colleague in your organization?
		Did you ask someone assigned to the project?
		Did you ask a librarian/library service?
		Did you consult with managers in other departments with a possible stake in the issue, but not directly involved?
		Did discussion stay with in AVH or were external organizations consulted?
		Did you ask someone in a similar position to yours in another organization?
		Did you consider hiring a research consultant(s)?
	Why did you ask that particular person?	What kind of information were you hoping for from that person?
		Were you hoping for verbal information (Expert opinion) or

		Written information?
	Did you read or review media information?	What? Newspapers, radio, TV
	Did you look for written information?	If you used written/published – printed or electronic - information, what did you use?
		Did you use internal AVH documents? Which ones?
		Did you use external information? What?
	Did you go to the Internet or look for other electronic information	What web sources did you use?
		Did you trust them?
		Who did the searching?
		Did you search yourself?
		Did you have a staff member search?
		Did a colleague search?
6. Did you use any other source?	What? (back to questions above, as appropriate)	
7. What information did you need but couldn't find?	What were the specific barriers that prevented you from finding this information?	
8. What information did you find most useful?	How confident did you feel about this information?	Did you feel that it was accurate?
		Did you feel that it was current?
		Did you feel that it was applicable to our situation here in rural Nova Scotia?
		On what did you base your confidence in the information you got?
	What did you expect that information would do for you?	Bring you up to date?
		Confirm what you already knew?
Information Seeking Questions		
9. How did you decide when you had enough information?	Approximately how long did you spend looking for information?	Was this typical for you in looking for information?
		If no, what made it different from other times when you have had to look for information?

	Were you satisfied with the type and amount of information that you had when you first stopped looking for information?	Why?
		Why not?
		If not, did you have to go back and look for more
		information after you had stopped?
10. If you were making this decision over again, what would you do differently, if anything?	Overall, as you think about this now, was the issue/decision/problem a positive or negative experience for you?	If you think of it as a positive experience, what do you recall was the best thing about it?
		If it was a negative experience, what could have changed that?
	Overall, was looking for information in this instance a positive or negative experience for you?	If you think of it as a positive experience, what do you recall was the best thing about it?
		If it was a negative experience, what could have changed that?
Now we will leave that situation I am going to ask you about how you look for information in general, to keep up in your field as well as to support decision making or help solve a problem.		
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?	If you do keep up with new information in your field, what tool or tools have you found work best to help you do that?	
	If you tend to look for specific information when you need it, how do you tend to approach that process?	do you prefer to look at everything you can find on a subject?
		do you look for specific information and stop when you have found that?
	If you look for only the specific information you need to support a decision or perform a task, what decisions about the search process do you make in advance?	Do you search generally on a broad subject?
		Do you decide what specific aspects of the subject you want?
		Do you decide type of information you need?
		Do you decide how much information you need?
12. What factors influence the level of effort you spend looking for information?	Does your **own previous experience** with an issue have an impact?	
	Does the **importance of the subject** have an impact?	How do you decide the level of importance of a task or problem?
		Do you use the AVH mission statement to measure/define task importance?

		Do you use the AVH strategic plan to measure/define task importance?
	Do imposed **deadlines for decision making** have an impact?	
	Does the **time** you have available have an impact?	
	Does the **source of the relevant information** that you do find have an impact?	
	Do any other factors influence the level of effort you spend looking for information?	
13. What are the most common types of decisions or tasks for which you look for information?	What are the most common problems you encounter in terms of looking for the information you want to do your job?	
14. Generally, if you could pick one type of information to find when you look for information what would you prefer?	Do you prefer verbal information?	Do you prefer expert opinion?
		Other people's experiences?
	Do you prefer printed information?	Internal reports, policies or other documents
		External publications, such as journal articles or government reports?
	Do you prefer electronic information?	If so, what sources are used most often?
		If not, why not?
15. Is there anything else you think I should know about the way you look for information?	Is there anything else you think I should know about barriers you might have in accessing information?	

<div align="center">

Knowledge of Population Health

Let's go back to the situation we discussed a few minutes ago and consider it again from a Population Health perspective.

</div>

16. Did you use a population health approach or decision making framework when considering the issue we just discussed?	If not, do you generally consider the AVH Population Health framework in decision making and problem solving?	If yes, please give an example
	If not, have you ever used a population health approach in your work?	If no, can you suggest how it might be relevant to your work?
17. I am going to read an excerpt from the Canadian Council of Health Services Administration's (CCHSA) AIM* Concepts:	*"The AIM Accreditation program includes principles of quality improvement, a population health approach and the use of indicators as elements of the organization self-assessment process". *(**A**chieving **I**mproved **M**easurement)* During our 2003 accreditation, was the meaning of "the Population Health Approach" as it is used in the CCHSA AIM document clear to you?	

	If "no", is it clear now?
18. Please share your experiences and opinions on learning experiences as they relate to Population Health	What opportunities have you already had to learn about population health and the population health approach? What kind of learning opportunities would you prefer be provided for you to learn successfully about population health? Please tell us what type of support or learning environment will help support you best in learning about population health and taking a population health approach.
19. Please share your experiences and opinions on using a population health framework in your decision making.	What are/might be challenges or barriers to you in working with a population health approach? Now that you have considered the barriers and challenges that make it easier for people to be healthy, please describe/tell us the supports you would need to take a population health approach in your decision making and health care planning. Is there anything you would want the Population Health Working Group to know about problems you might have in adopting this approach?

4.3 Pilot Interview Participants' Evaluation Form

IF MORE SPACE IS NEEDED FOR ANY QUESTION, PLEASE USE THE BACK OF THIS SHEET

1. The interview was structured around 10 main questions. Each of these has some second and third level questions that may or may not be used depending on your answer(s) to the main question. Did you have any trouble understanding any of the questions? Were they generally clear? ☐ yes   ☐ no

2. Was the information gathering approach that I used – the interview and the demographic questionnaire acceptable and appropriate to you? ☐ yes   ☐ no

3. The interview sequence was as follows:
    3.1. We discussed confidentiality, what I will do with the data, your consent to participate and your consent to taping
    3.2. We talked about the interview format and content and review of technique
    3.3. I asked you to tell me about a recent particularly effective meeting that you attended where your group solved a problem or made a decision
    3.4. I asked you questions about information gathering and information sharing to support that decision or problem
    3.5. Then I asked you to complete an exercise where you sorted information into three categories – "need to have", "nice to have" and "not required"
    3.6. I asked you some general questions about how you usually look for and share information and about attending meetings.
    Was the sequence during the interview acceptable and appropriate? ☐ yes   ☐ no

4. Transition statements were used to both bring your situation into the interview and to bridge questions, including skipped questions. Was the use of transition statements acceptable/appropriate? ☐ yes   ☐ no

5. Were there any instances where you wondered if I was skipping questions, or where the sequence of questions seemed clumsy or question patterns struck you as strange? (Explanation: In some cases in answering the immediate question, you also very clearly answered the very next question. So rather than ask you a question you had just answered, I skipped it and went on to a second part or third level question. Or in some instances your answer made it clear that one of the possible directions I might take was not appropriate, so I skipped some of the second or third level questions.) ☐ yes   ☐ no

6. Were the instructions and explanations I gave at the beginning of the interview adequate? ☐ yes   ☐ no

7. Was the time I gave you to answer each question before continuing adequate/appropriate? ☐ yes   ☐ no

8. Did you feel the time allotted to the exercise was enough? ☐ yes   ☐ no

9. Was the length of the interview adequate/appropriate/too long? ☐ yes   ☐ no

10. Were there any omissions? Did any other subjects or other questions that might be included occur to you? ☐ yes   ☐ no

11. Do you have any suggestions that would help me improve my technique or approach? ☐ yes   ☐ no

12. Were you comfortable throughout?   ☐ yes   ☐ no

13. Were there any questions that made you uneasy?   ☐ yes   ☐ no

4.4 Interview Participants' Demographic Questionnaire

Please answer the following questions and leave the sheets with me before you leave the interview room. All answers will be completely confidential. Please answer in the space provided or check the box before the most appropriate answer.

1. Name: _____

2. Please indicate your sex ☐ Male ☐ Female

3. What year were you born?

4. How many years of healthcare work experience do you have?

5. Please indicate your health service area

☐ Administration	☐ Environmental Services	☐ Food and Nutrition
☐ Finance	☐ Health Records	☐ Nursing
☐ Human Resources	☐ Information Services	☐ Rehabilitation Services
☐ Communications	☐ Materiels Management	☐ Other Acute Care Service
☐ Addictions	☐ Medical Lab	
☐ Health Promotion	☐ Pharmacy	
☐ Mental Health	☐ Plant	
☐ Public Health	☐ Other Operations Service	
☐ Other Community Health Service	☐ Diagnostic Imaging	

6. Please indicate your current AVH Occupation/Role

☐ CEO or Vice President	☐ Manager	☐ Research Officer/project staff ☐
☐ Other Member of Senior Executive	☐ Coordinator	Other _____
☐ Director		

7. Please indicate your employment status
☐ Permanent part time   ☐ Other _____
☐ Permanent full time

8. Please indicate the education you have completed. Please tick as many as apply.

☐ High school	☐ Higher education (university degree)
☐ Other post-secondary education (includes diploma or trades certificate)	☐ Professional training
	☐ Other. Please tell us.

Thank you.

4.5 Concluding Remarks

- Thank you for your time and energy in giving such a clear account of the incident and in telling me about how you search for information.
- The information you have provided is valuable.
- All of the information you have provided will be kept confidential.
- I will be putting the information that you have provided here together with other interviews to create a questionnaire.
- I hope to have all of the members of the AVH leadership forum complete this questionnaire.

Appendix B Ethics Documents
Submitted to Annapolis Valley Health Research Ethics Committee

PARTICIPANT CONSENT TO PARTICIPATE
STUDY INFORMATION AND FORM

STUDY TITLE:	***The use of information by health care planners operating within a population health framework in the Annapolis Valley, Nova Scotia, Canada.***
PRINCIPLE OR QUALIFIED INVESTIGATOR:	Jackie MacDonald, MLS BSc Manager, Library and Knowledge Management Services Shared Services, Western Nova Scotia (Dalhousie School of Nursing - Yarmouth Site, Annapolis Valley Health, South Shore Health, and South West Health) 60 Vancouver Street, Yarmouth NS B5A 2P5 phone: 902 742 3542 x306 fax: 902 742 1698 email: jmacdonald@swndha.nshealth.ca
STUDY SPONSOR:	**n/a**
STUDY SUPERVIDOR(S):	Dr. Peter Bath Department of Information Studies University of Sheffield Andrew Booth School of Health and Related Research Faculty of Medicine, University of Sheffield
STUDY TIMELINE:	July 2004 – June 2008.

INTRODUCTION:
You are invited to take part in a research study of health care decision makers within Annapolis Valley Health. Taking part in this study is voluntary. Participating in this study might not benefit you, but information may be gained that will benefit others. You may withdraw from the study at any time. The study is described below. You should discuss any questions you have about this study with the people who explain it to you.

PURPOSE OF THE STUDY

The results of this study will be submitted in fulfillment of the requirements for the Degree of Doctor of Philosophy, Centre for Health Information Management Research, University of Sheffield.

Annapolis Valley Health has adopted a population health framework to guide decision making. Decision makers - health care managers, Senior Executive and Board members – must be supported with the information they need, when they need it. This study will contribute to knowledge about information

needs of this group, an area where there has been little research done to date. Once decision makers' needs have been identified, resources to meet them will be made available through a web portal. The evaluation of the portal will be part of this research.

STUDY DESIGN
Literature reviews will be conducted using a variety of resources in the following areas:

- Information Seeking behaviour and information use for problem solving and decision making: General, Health care workers', supporting a Population Health Decision Making Framework
- Qualitative, Quantitative Research: General, and Critical Incident Interviewing
- Knowledge Management: Principles of Web Page Design, Corporate Knowledge Management Portals, Knowledge Management in HealthCare, Knowledge Management supporting a Population Health Decision Making Framework

Health care decision makers' needs to support decision making within a population health framework will be addressed using a mixed-method approach. First, a small-scale exploratory study using a minimum of 12-15 taped semi-structured interviews with an interview guide will be used to identify the main issues that are of concern. Data will be analyzed qualitatively.

From these, a questionnaire will be developed to gather information on needs, including information needs and knowledge of the population health framework. It will determine whether and how much these needs can be generalized to the whole group, and identify any needs not identified during the interviews. Responses on information needs will be triangulated for confirmation and completeness using between methods triangulation as appropriate.

Results of the interviews, the questionnaire, and the literature review will be used to determine which information seeking model most effectively represents this group. This exploration will include application of the steps in the evidence based practice approach to health care planning.

The knowledge management portal will be designed using information gathered from interviews, the questionnaire and a literature search. Its use will be evaluated by use statistics, questionnaire and screen captures.

STUDY PARTICIPANTS

There are about 145 potential participants, including
- Members, AVH Senior Executive
- 12 DHA Board Members
- CHB Board Members

- Managers and Members, AVH Leadership Forum

There are no exclusion criteria.

PROCEDURES OF THE STUDY:

Interviews:
Fall, 2004: A sample, 3-5 members, of each group will be asked to participate in a semi-structured interview.

These interviews will take approximately [1 hour?]

Questionnaires:
Spring/Summer, 2005: All participants will be asked to complete a two part questionnaire. Part 1 will ask for information about the individual participant. Part 2 will ask for information about the individual participant's information needs and challenges.

Spring/Summer, 2007: All participants will be asked to complete an evaluation questionnaire to assess their learning about population health and the evidence based practice approach, and to assess their satisfaction with the information resources made available to them through the portal and with the portal itself.

POSSIBLE HARMS and DISCOMFORTS:
Although it is not expected that any participant will find the interviews and questionnaires received during the course of the study upsetting or distressing, participants will not have to answer any questions found to be too distressing.

POSSIBLE BENEFITS:
Although there is no guarantee you will benefit personally by taking part in this study, it is expected that your contribution will contribute to improvements in Library and Knowledge Management Services to Annapolis Valley Health.

It is also anticipated that information may be gained that will help in the planning and delivering Library and Knowledge Management services to other health care decision makers in the future.

WHAT IF I DON'T ENTER THIS STUDY?
It is your own choice to take part in this study. If you do not wish to participate, there will be no repercussion. However, you may have needs and challenges that may not be reported elsewhere.

COMPENSATION:
None.

RESEARCH-RELATED INJURY:
Not applicable.

CONFIDENTIALITY:
You will not be identified as a study participant in any reports or publications of this research. Your records will be kept in a secure area such as a locked file cabinet. Only the staff involved in the research study will see them.

DECLARATION OF FINANCIAL INTEREST:
None.

WITHDRAWAL FROM THE STUDY:
If you choose to participate and later decide to change your mind, you can say no and stop the research at any time. A decision to stop participating will not affect any services provided.

OTHER PERTINENT INFORMATION:

QUESTIONS OR PROBLEMS:
If you have any questions about the study, or about your rights as a research participant, you should contact Jackie MacDonald, phone: 902 742 3542 x306 fax: 902 742 1698
email: jmacdonald@swndha.nshealth.ca.
.

SIGNATURES:

Investigator: Confidentiality and Anonymity
The discussion will be audio taped and the tapes will act as a memory aid. All information given by participants will be anonymous. The discussion will be transcribed, (from tape to paper), and during the transcription of the tapes, each participant will be assigned a number, and will therefore, remain anonymous. After the tapes have been transcribed, each tape will be safely locked away.

Signed: [Investigator]

Participant:
I have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I understand that the interview discussion will be audio taped. I hereby consent to take part in this study.

Signature of Participant   *Date*

Signature of Person   *Date*
Conducting Consent Discussion

Signature of Witness   *Date*

Signature of Investigator   *Date*

Research Protocol for Annapolis Valley Health Research Ethics Submission

Jackie MacDonald
December 10, 2007
2071 Words

Amendment to 2003 Research Protocol AVH DREC #2004-004:
The use of information by health care planners operating within a population health framework in the Annapolis Valley, Nova Scotia, Canada.

1. Title:

Phase II: Information sharing among health services leaders in Annapolis Valley Health (AVH), Nova Scotia, Canada.

2. Background:

Phase I of this thesis research was an interview study with 19 participants selected from among AVH leadership and volunteer board members. Interview data were analyzed and grouped in four broad themes: information and decision making, information and sharing, information and seeking, and information and population health.

This amendment to the 2003 Research Protocol has arisen from study findings related to information sharing. Analysis of interview data in this area suggested group decisions have an important role in organizational progress, and meetings have an important role in this. There was not enough detail to describe with certainty what takes place or to draw conclusions.

2.1 Phase I Findings Related to Information Sharing
Most Phase I participants described unstructured, group decisions. All used information to support their decision and most drew on other people as information sources. In some cases, participants brought people together to consider issues in meetings or virtually by email or phone. In others, they sought perspectives and opinions from individuals and then put the pieces together. Analysis of participant responses suggested the following:

- Vice Presidents, Directors and the District Board Chair do not generally gather information to support decisions themselves - they ask intermediaries to gather it for them. This is congruent with Niedźwiedzka (2003) who observed that managers tend to use intermediaries (managers at a lower level, information officers, co-workers, etc) as information sources.
- Managers, and to a greater extent, Other Leaders (these were leaders who did not directly supervise staff) purposefully gathered new information to support decisions. Most of these provided or managed information to/for their own department as well as other departments.
- Managers tended to gather internal information, provide information from their own knowledge, and use the literature, conferences and networks to keep up with trends related to how their own departments should best function; they also searched for research literature themselves or asked intermediaries to search for it.
- Other Leaders tended to actively search the research literature themselves or have librarians search it for them. Then they would synthesize it, put it in context and share it.

2.2 Research on Group Decision Making
Decision making, including group decision making, is a focus of Operations Research (OR). There is literature in OR and other disciplines that includes theoretical work on teams in

decision making, their role in determining procedural aspects of decision making and the benefits of composite decision making, particularly in planning and review. Improvement in decision outcomes resulting from both information exchange and communication between team members has been recognized in group decision making (Simon, 1965, 1978). There is a very small amount of research on the relationship between decision phase, information availability and decision quality (Saunders & Miranda, 1998).

2.3 Research on Meetings
Registered parliamentarians suggest best practices for meeting behavior and meeting effectiveness (Mina, 2002). There are practical articles in the literature of most disciplines related to meeting effectiveness, some of which include survey responses on perspectives of meeting effectiveness.

There has been no empirical research identified to date that focuses on information sharing and information behavior at meetings.

2.4 Research on Health Services Decision Making, Group Decisions and Meetings
The literature on healthcare decision making is generally critical of healthcare managers' approach to decision making processes and information use. Some authors suggest that relevant research evidence is not always considered by healthcare decision makers, that policy decisions are often made with little reference to research evidence, and that lack of evidence leads to faulty or delayed decisions (Mitton *et al*, 2003; Brehaut & Jushwin, 2005; Zitner, 2003). Others have suggested approaches for healthcare managers to use when making decisions, including applying evidence-based decision making to all healthcare decisions (CHSRF, 1998; Winkler, 2001)

There have been few research studies of healthcare managers as they draw on information while engaged in decision making. Consequently there is little known about the information they do use in decision making, when they use information in their decision making processes, how they look for information, or choose their information sources.

One study was identified on health services managers' perceptions of meeting effectiveness (Moss, 2000).

3.   Specific Problems to be Examined

Most Phase I interview participants described having multiple conflicting priorities and short time lines for decision making. They described using both internal information (information about the organization; information generated by the organization and information already applied to organizational practice) and external information (how things work in other organizations, new legislation and related sources and research based information). They noted that some internal information is available in writing, though much of it is not, and that written internal information is hard to find.

Participants looked for internal information first, to set context, and then if they had time or thought it would make a difference, they looked for external information. They generally made decisions without all of the information they would like to have, realizing that a good enough decision on time is better than a perfect decision too late. They knew they could do without some information, while other information gaps could not be bridged so postponed decisions.

There were no Phase I interview questions related to group decisions or to meetings. The majority of participants mentioned meetings. A look at the District calendar for meeting room bookings indicates that many meetings take place.   These could provide some structure to look at information sharing within groups.

3.2 Research Questions

RQ1: What groups meet to share information within Annapolis Valley Health?
RQ2: In groups that meet to share information within the membership of the organization, are there differences in the information shared by positions at different organizational levels?
RQ3: How is new information, including research based information, acquired, shared, evaluated, absorbed and implemented within the District?
RQ4: What established search model, if any, best represents information behaviours at each organizational level?
RQ5: What are the group's interactions with information? Can these be classified according to the Cool and Belkin Faceted Classification Scheme?

4.   Methods and Timeline

A general approach is outlined below. Appropriate methodology will be developed as part of the research study. The document analysis, interview and observation studies are to be complete by May 31, 2008.

4.1 Literature Review
Methods are as outlined in the 2003 research protocol.

4.2 Data Gathering and Analysis
Phase II will use qualitative methods to explore information sharing during meetings. Retrospective document analysis of 2007 bookings for AVH general meeting rooms and of 2007 meeting records will be used to set context for prospective interview and observational studies respectively.

Question 1: What groups meet to share information within Annapolis Valley Health?

This question will be answered using document analysis. The 2007 Booking Calendars of 20 of AVH's main meeting rooms at 6 sites will be examined as follows:

- Classify within 2 broad groups (meetings of staff; meetings for/with the public) the approximately 8,035 meetings scheduled in 20 large AVH meeting rooms in 2007
- Exclude meetings involving the public (patients, clients, and families), volunteers and sales reps.
- Examine and further classify remaining groups
    - As homogenous (single department, program, portfolio) or heterogeneous (members from different programs, portfolios)
    - By committee/group type (standing, ad hoc, advisory, steering, etc.)
    - Classify further according to an existing typology or taxonomy (or develop one) that identifies the general purpose of the committee
- Complete general analysis of meeting participants
    - Identify members active in two or more groups; determine their position levels on the AVH organization chart

Question 2: In groups that meet to share information within the membership of the organization, are there differences in the information shared by positions at different organizational levels?

This question will be addressed using a small-scale exploratory interview study.   A minimum of 12-15 interviews will be conducted. Data will be analyzed qualitatively. A general approach follows:

- A sample of individuals who actively participate in multiple groups and committees will be selected from the analysis of meeting participants
- Consent to interview 10-20 individuals will be obtained. Questions will relate to their information access and sharing, their perceptions of their own role in committees and

groups and the validity or accuracy of documentary sources associated with a very recent meeting; obtain demographic information
- Interview data will be analyzed
- Permission/consent for further study in meeting situations will be obtained

Question 3: How is new information, including research based information, acquired, shared, evaluated, absorbed and implemented within the District?

Question 4: What established search model, if any, best represents information behaviours at each organizational level?
Question 5: What are the group's interactions with information? Can these be classified according to the Cool and Belkin Faceted Classification Scheme?

These questions will be answered through document analysis of meeting records and observation at meetings. A general outline follows:

Document Analysis – Meeting Records
- A sample of committees/groups that includes Phase II interview participants will be indentified to investigate further
- The researcher will approach the Chairs and ask for permission to examine 2007 meeting records.
- These will be analyzed to identify decisions made and the function and role of information within the group
- The role of Phase II interview participants will be examined

Observation
- A sample of committees/groups will be identified for further investigation
- The researcher will approach the Chair and ask for permission, with signed consent from all of the membership, to attend one meeting to observe and gather data on how information is acquired and shared and its function and role.
- Data gathered will be analyzed
    - The Cool and Belkin Faceted Classification Scheme (Cool & Belkin, 2002) will be considered with respect to its suitability for classifying information interactions
    - Phase II participant interviews will be examined for congruency between interview participants' perceptions and meeting action.
    - Whether and how well the information behaviour of each interview participant can be represented by an existing model will be considered.

4.3 Timeline

Phase II Component	Complete by
Document analysis of Meeting Room Booking Calendars	January 31, 2008
Identify participants and schedule interviews for early March, 2008	February 5, 2008
Identify committees/groups for meeting records study and request records	February 15, 2008
Draft interview guide for participant interviews;	February 28, 2008
Phase II interviews	March 15 2008
Document analysis of meeting records	March 31, 2008
Observation of meeting action	April 30, 2008
Phase II data analysis	May 31, 2008

5. Resources Available and Required

Cost of fieldwork will be met by the applicant, as will travel costs to the UK.

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Appendix C. Interview Guide for Phase II Interviews[1]

J. MacDonald
February 28, 2008

1   Overview of the case study project

1.1   Project Objectives

To understand the information sharing behaviour of those involved in planning and managing healthcare, it is necessary to understand how they interact with the information they use and need as individuals and as members of a group working together to solve a problem or make a decision. Whether there are differences in the information needed by and shared by positions at different organizational levels is also of interest.

1.2   Auspices

This work is being done under joint supervision from the University of Sheffield Department of Information Studies & the Faculty of Medicine School of Health and Related Research.

1.3   Issues of Interest

- Information sharing in group decision making
- Interactions with information - how it is acquired, shared, evaluated, absorbed and implemented
- Differences in interactions with information at different organizational levels
- Meetings information management

1.4   Relevant readings

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2   Field Procedures

2.1   Entry strategy

The Researcher is employed by three district health authorities in western Nova Scotia Canada. This study was initiated by a committee from one of these, Annapolis Valley Health (AVH). The group, 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. The question could not be answered from existing research.

In 2003, the current CEO of Annapolis Valley Health was approached and approval was requested. The application process to the Annapolis Valley Health Ethics Committee to conduct a study was completed and approved in 2004. A change to the research protocol to allow for this study was approved by the AVH Research Ethics Committee in January 2008.

Participants will be contacted by email with an explanation of the research and the interview process and asked if they would consent to an interview.

2.2   Participant selection

The AVH email address book with position titles was downloaded and sorted, with portfolios and position levels noted. **Position levels** include *leaders*, who generally report to a *manager* (responsible for a

department) who reports to a *director* (responsible for a service involving multiple departments) who reports to a *Vice President* (responsible for multiple services) who reports to the *CEO*. Senior Executive includes the CEO and the four Vice Presidents who head the **portfolios** of *Acute Care, Community Health, Operations* and *Medicine*. A fifth group, *Administration* and includes Corporate Staff, Communications, Human Resources and Finance.

Participants in this phase of the study includes are paid employees of Annapolis Valley Health. Shared Services staff (directors and managers shared by three district health authorities), volunteers, including Board Members, and physician members of the Medicine Portfolio who are not District employees are outside the scope of this study.

Sixteen participants were selected in four groups likely to communicate among themselves as well as with other groups. Each group includes individuals at different levels on the organizational chart. Interviewees were selected with attention to representation from different portfolios with the expectation that they would be active within their own portfolio as well as in meetings with individuals from other portfolios. Two groups are heterogeneous – two different portfolios – and two are homogenous, one with respect to portfolio and one with respect to department. An effort was made to interview more participants at the "Other Leader" level.

	Junior Leader	Manager	Director	Senior Executive
Acute Care	x	x	xx	
Administration	x	-	x	xx
Community Health	xxxxx	xx	-	
Operations	x	x	-	

Table 2-1 Participant Selection for Phase II Interviews. "-" indicates that managers at that level had been interviewed in Phase 1.

2.3   *Invitation to Participate in the Interview*

Hello ####,

Would you let me interview you for my thesis research? I expect the interview will take from 30 minutes to just under an hour of your time.

I have been studying healthcare decision makers and this is the second phase of my research study. The purpose of these interviews is to examine information sharing in groups making decisions and solving problems. I am hoping to identify types and forms of information shared in group decision making at meetings, and explore differences in information gathered, shared and needed at different levels on the organization chart.

The interview question set uses critical incident technique - debriefing - to focus discussion on a recent meeting where you were part of a group that made a decision or solved a problem. To prepare for the meeting, I would ask you to think of a recent meeting that you attended in your job with AVH where you were involved with a group in solving a critical problem or making a critical decision. This should be a meeting that went particularly well, one where the group successfully solved the problem or came to a decision within a fairly short time frame. Our discussion will focus on the information that contributed to the resolving the critical issue rather than the issue itself. An exercise about information you need most will follow. I have included some additional information about my research below.

Interviews will be taped. Participant responses will be confidential. Responses will be analyzed – transcribed, broken into concepts, entered into a database for storage and retrieval, then coded and themed. A short demographic questionnaire to gather general information on participants will follow the interview.

I am hoping to complete these interviews by the end of March.

Thank you very much for giving this your consideration and I look forward to hearing from you.

Jackie

- **About my Research:** This is the second phase of a health information management study leading to a PhD from the University of Sheffield. The work is being done under joint supervision from the University of Sheffield Department of Information Studies & the Faculty of Medicine School of Health and Related Research. The working title of this research is *The use of information by health care planners operating within a population health framework in the Annapolis Valley, Nova Scotia, Canada.* Last July, a presentation of findings from Phase I received the Best Paper award at the 2007 International Symposium for Health Information Management Research in the UK.

- **Ethics Approval:** The research protocol for this study has been approved by the AVH Research Ethics Committee. It will follow the Committee's Guidelines and use their consent forms.

- **Interviewee selection:** I have selected four groups of four healthcare decision makers from AVH paid staff. I expect that each of these individuals communicates extensively with other staff within and outside their own departments and portfolios. Two groups are homogenous with respect to portfolio or department and two are heterogeneous – members are from different departments or portfolios. Each group includes people at different levels of the organization chart. Groups include staff from Administration and Community Health, Acute Care and Operations Portfolios.

- **Critical incident technique:** Originally designed for incident debriefing, the CIT is now commonly used in qualitative research. I used this approach in Phase I of my study.

- **Semi-structured interviews** use a standard question set to guide interviews but deviating from these to follow up discussion points is encouraged.

- **Research on health care decision makers:** This is an understudied group. Only three research studies of healthcare managers information behavior have been identified, one by Head (1996) in the U.K., Moahi (2000) in Botswana and Niedźwiedzka (2003) in Poland. There are an increasing number of commercial products available designed to provide information to support healthcare decision making - but no studies of the information decision makers do use now, the barriers they face in finding information to support decisions, or even the kinds of information they need and use has been identified.

2.4 Interview Materials

Interview materials will include the AVH Ethics Committee consent and anonymity form, the demographic questionnaire, the question set, a card set with different types of information that Phase I participants said influenced their decisions, an envelope to seal the cassette with the consent form, the demographic questionnaire, and the card set. An interview evaluation form will be used with the pilot interviews. Other materials include additional batteries and an extension cord and an electric tape recorder, cassettes and battery backup.

3 Interviews

3.1 Introductory Remarks

The Second Interview Study process used introductory and concluding remarks as outlined for the First Interview Study, Appendix A.

3.2 Interviews

Direction to participants: I would like you to think about a recent meeting that you attended in your job with AVH where you were involved as part of a group in solving a critical problem or making a critical decision. I would like you to select a meeting that went particularly well, one where you solved the problem or came to a decision at that meeting. This would be a non-routine decision – something new to the group. Perhaps an issue related to initiating or terminating a new service or program, or one that had a direct impact on budget – an increase in spending healthcare dollars or a reallocation of resources. When you answer these questions, I would like you to think about the information that you considered in contributing to the outcome. After that, I will ask you to do an card sorting exercise that involves thinking about how much you would have needed different kinds of information for this same issue. Then I have a short demographic questionnaire.

3.2.1 Complete Question Set

Main Question	Secondary questions to be used if needed	Probing Questions, to be used if needed
1. **Could you please tell me about a particularly effective meeting you attended lately where the group solved a problem or made a decision?**	1. What was the name of the group? 2. Are you a regular member? 3. If you were a guest at the meeting, why were you invited?	• What issues of similar complexity or importance been considered by this same group at previous meetings? • Was this meeting typical of this groups effectiveness
2. **Now could you please tell me just enough about the decision or problem so I will understand its complexity?**	1. What was the decision or problem that your group discussed at the meeting? 2. When did the issue come up? 3. Who brought the issue forward? 4. How long did you spend preparing for this meeting, approximately? • What was the group's goal with respect to this issue?	• How did it come about? • What do you recall of it ever being discussed before? • How would you describe it in terms of its impact on the organization? • What process was followed to reach the goal? • Are there any AVH policies in place that relate to this issue? • How was consensus achieved?
3. **Please tell me about the information the group considered that had an impact on the decision?**	1. What information did you provide to the group that was new to any of the other members? 2. Where did you get it? 3. How did you know it was credible?	• If you searched purposefully for it, how did you do that? • If someone else gave it to you, who was that? • Why were you the one to share this information and not someone else? • If you had not been there to share this piece of information might it have been provided by someone else?
4. **What other information did members share that had an impact on the outcome?**	1. What was it? 2. What reservations did you have about its credibility, if any	• Who provided it? • If that person had not been there to share this piece of information might it have been provided by someone else? • What other information was shared that did not have an impact on the outcome?
5. **Please tell me a little about your participation in meetings and your use of meetings information.**	1. How many committees or working groups do you meet with regularly? 2. What is their purpose for the most part? 3. When would you tend to refer to meeting records after meetings?	• If you were to look at your calendar for the past six months, approximately what % of your time is spent in meetings? • How would you break these down in terms of meetings within your department, portfolio, the DHA, etc? • Do the groups that you meet with tend to have written terms of reference? • Do they tend to have advance agendas or meeting minutes?
Additional questions following calendar study: 6. "Do you participate in many informal, small group meeting? Can you tell me about these?",	"How many of the meetings you attend would be small group meetings?"	• How are informal small group meeting actions and decisions recorded?". and "When do you consult the group's meeting records?".

3.3 Card Sorting Exercise

I'd like you to continue to think about this issue as if you had not yet dealt with it. I'm going to give you a set of 60cards, each with a different piece of information on it. Fifty two of these were pieces of information that people in my earlier interview study said they were looking for when they made their decision. I added the other 8 myself from experience giving information and from the literature.

Could you please think of these with respect to the issue resolved at the meeting? Please sort these into three piles. The first pile would be "need to know" information that would have had a significant impact on your group; the second pile would be "nice to know" information you would have liked to have had when you made the decision; but not having it would not have prevented the decision from being made. The third pile would be information that would not likely have made any impact on the outcome; group members would probably not have looked for it.

I have a sheet here with these same instructions written on it. If you are not sure what any of the card labels means, there is an explanation on the back. Please ask me if you need more information.

Thank you for doing this. I am going to staple these in three sets, add your initials and put them in the envelope.

3.4 Demographic Questionnaire

The Second Interview Study used the same demographic questionnaire as was used in the First Interview Study, please see Appendix A.

4 Report Outline

The report will integrate results with discussion with findings supported with quotations from participants or references to other research literature.
1.1 Issue or problem being studied
1.2 Review of relevant literature
1.3 Methods used
1.4 Findings from the data collected and analyzed
1.5 Conclusions and implications from the findings.

Appendix D. Tables from the First Interview Study

Index Term	Churchman, Ackoff, Arnoff 1957	Simon 1960	Osborne Creative Problem Solving Model 1963	Mcober and Bird 1981	Wallace's Suggested Decision Making Agenda 1987	Taylor's Information Use Environments 1991	Massey & Clapper 1995	Rosenberg & Donald 1995 Steps in EBM	Bissantz & Kuhn 1999	Wilson's 1996	Whittet Rational Decision Making 2000	Forrest Six Steps EBM 2003	Niedzwiedzka 2003 (Modified Wilson 1996)	Forsman's Decision Making Process for Healthcare Managers 2003	Multiple 2005
Uncertainty		Intelligence (problem definition and problem resolution)		Problem Identification						Uncertainty			Identification of information need		Initiation
Decision to seek information													Decision to seek information		
Problem Identification			Objective finding					Formulate a clear clinical question from a patient's		Problem Identification	Identify objectives	Transformation of the clinical problem into 3 or 4 part question			Selection
Problem definition	Formulate the problem (Identify)		Problem Finding	Problem definition (problem)	Define Problem			Construct a well built clinical problem		Problem definition					
What do we know							Sense making					Additional step: answer			
Information seeking performed by user												Finding "external" evidence" to answer the question	Information seeking performed by user		Exploration
Information seeking performed by formal and informal intermediaries					Define Selection Criteria								Information seeking performed by formal and informal intermediaries		
Define alternatives in search process					Define Alternatives						Generate a list of alternatives				
Information Seeking Strategies								Search the literature for			Search widely for information				Formulation
Location and Access			Fact finding												Collection

Study of sixteen information behaviour and decision making models, December 2005

#													
11.	Own knowledge and reference collection										Own knowledge and reference collection		
12.	Computerized search systems										Computerized search systems		
13.	Information centres, libraries, etc										Information centres, libraries, etc		
14.				Enlightenment: context information				Use of information			Selection and processing of information by intermediaries		
15.	Identify Alternative Solutions	Construct a mathematical model	Design	Idea finding	Alternatives generation	Problem Understanding: better comprehension of a specific problem	Evaluate (critically appraise) the evidence for its	Development of Alternatives				
					(potential solutions)	Instrumental: what to do and how to do	validity and usefulness						
						Factual: precise							
16.	Rate Alternative Solutions			Evaluation and selection	Rate Alternatives	Confirmational: verify a piece of information			Determine quality of alternatives			
17.	Process Information					Projective: future oriented	Action Making – Solving		Process information			
18.	Use Information	Derive a solution				Motivations: relates to personal or Political: relationships, status, reputation.				Information application		
19.	General Discussion				General Discussion				Examine pros and cons	Layered Advice	Critical appraisal of the external evidence		Get the right parties together in an appropriate environment for discussion.
20.	Reconsider Information				Vote or Straw Poll				Reconsider information				Allow for expression of divergent beliefs, opinions and values.

Presentation

#	Action										Description
21.	Identify goals										Promote an understanding of what the mutual (agreed upon) goals are.
22.	Establish the steps to achieve these mutual goals.										Establish the steps to achieve these mutual goals.
23.	Analyze Issue										Subject the issue(s) to detailed analyses in a fair and objective way.
24.	Identify and clarify values										Respect the different interpretations of the analyses based on different perspectives and values, and make these explicit (values clarification
25.	Provide appeals process					Conflict Integration					Provide an appeals mechanism to a third party when both sides feel that compromise is difficult to negotiate.
26.	Select Alternative	test the model and the	Choice (select and	Solution Finding	Implementation	Group Decision					Place closure on issues such that parties, or some
27.	Acknowledge concerns										Give voice to concerns.
28.	Allow issues to surface										Promote the surfacing of issues to prevent pre-empting of one perspective over another
29.	Eliminate possibility of	Establish controls over									Prevent insidious erosion of the quality of care
30.	Integrate findings			Acceptance Finding						integrating external and internal evidence	
31.	Implementation	Put the solution to			Decision Integration		Implement useful	Problem resolution			
32.	Solution statement	solution to						Solution statement	Develop a plan		
33.	Plan Evaluation										
34.	Monitor outcomes								Monitor outcomes	Evaluation of decision making process	

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Respondent Validation Sheet
Healthcare Decision Makers Information Needs and Uses Study (2005·2006)

Participant name: _____Date of interview: _____

 Current address, if no longer with Annapolis Valley Health: _____

Could you please review this summary and tick the response boxes as appropriate.

1. Do you think that this summary accurately represents the discussion we had during your interview? ☐Yes ☐No

If no, please explain. Please attach more pages if needed.

_____

_____

2. Can you recall any discussion related to **information and decisions** that is not included in this summary? ☐Yes ☐No

Please use the space below to tell me what has been missed and/or to point out anything that is here that does not seem to reflect the AVH environment as it was in 2005-2006. Please attach more pages if needed.

_____

_____

_____

3. Can you recall any discussion related to **information and sharing** that is not included in this summary? ☐Yes ☐No

Please use the space below to tell me what has been missed and/or to point out anything about information and sharing that is here that does not seem to reflect the AVH environment as it was in 2005-2006. Please attach more pages if needed.

_____

_____

_____

4. Can you recall any discussion related to **information** s**eeking** that is not included in this summary? ☐Yes ☐No

Please use the space below to tell me what has been missed and/or to point out anything about information and sharing that is here that does not seem to reflect the AVH environment as it was in 2005-2006. Please attach more pages if needed.

_____

_____

5. Can you recall any discussion related to **information and population health** that is not included in this summary? ☐Yes ☐No

Please use the space below to tell me what has been missed and/or to point out anything about information and population health that is here that does not seem to reflect the AVH environment as it was in 2005-2006. Please attach more pages if needed.

_____

_____

_____

6. From your own knowledge of the AVH environment, in 2005-2006, do you think that this Summary accurately represents discussion with AVH leaders? ☐Yes ☐No

If no, please tell me what does not seem to ring true. Please attach more pages if needed.

_____

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7. Other comments about this summary are appreciated. Please use the space below.

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Thank you very much. Please post this form back to me in the enclosed envelope.

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The Information Needs and Uses of Healthcare Decision Makers:
Findings of a small scale exploratory study

Validity

One way researchers can assess the credibility of their interview findings is to ask participants to review a summary of these, and comment on the accuracy of the researcher's understanding and interpretation.

In these 2005-2006 interviews, leaders from Annapolis Valley Health were asked to describe a recent critical decision and discuss the information they used to support it. Findings are summarized here according to themes and sub themes generated from analysis of interview results. From a great deal of interesting discussion, I chose four themes for exploration and analysis: information and decisions, information and sharing, information and seeking and information and population health.

Sub themes: information and decisions
Decision complexity
Work roles
Decision influences
Enough information

Sub themes: information and sharing
Motivation to share
Method of sharing
Origin of shared information
Credibility

Sub themes: information and seeking
Characteristics of seekers
Role of information
Characteristics of Sources
Barriers and Challenges to information use

Sub themes: information and population health
Knowledge
Application

Theme one: Information and Decisions

Decision Complexity

- All participants described decision situations that were unstructured or unique, meaning they were new to participants, and participants were not aware if similar situations had been encountered within the organization in the same form before.

- No participant identified a district policy that would guide their decision.

- Almost all participants described their situations as administrative decisions (for example, "Where do we put this service and how do we staff it?"). In only two divergent cases were public policy decisions described (for example, "What services should we offer?"). No participant described a clinical policy decision (for example, "Who qualifies for this service?")

- Almost all decisions were group decisions with the participant in a leading role.

- The majority of participants described situations that arose out of problems. Several participants described situations that were crises. As expected in critical incident cases, no participant described a situation that was purely an opportunity.

- The majority of participants who faced problem decisions took the opportunity to both solve the problem and improve aspects of the workplace or service.

- Some participants described decisions that were simply operational or simply tactical but no participant described a decision that was simply strategic.

> *Decisions levels* are *strategic (*far reaching and consequential for the organization*), tactical (*medium range, medium significance decisions with moderate consequences made in support of strategic decisions*) or operational (*every day decisions that support tactical decisions).

- Most participants described decisions that were complex in that they generally spanned two or more decision levels, either operational-tactical, or tactical-strategic. No participant described an operational-strategic decision.

> **Conflicting priorities**: *When I am looking at something like this, this is one of many, many things I am doing …* (Director)
>
> **Situation Matching:** *I will ask around a bit and another guy might say 'well look, you know I have been working here for the last 20 years and here's what is going to happen'.* (Director)
>
> **Time pressures:** *…one of the things that I don't think we are really good at, giving people enough time to make decisions around certain things.* (Manager)

- Participants in more senior positions described complex operational-tactical-strategic decisions that spanned all three levels.

- Almost all participants were clear about the goal in their decision situation.

- A slight majority of participants were unsure of what processes to follow to implement their decision.

- The majority of participants did not use a decision making model to guide them through a prescribed sequence of decision making phases and steps, such as selecting a range of alternatives, developing selection criteria and evaluating or comparing multiple options.

- The majority of participants relied on their expertise and experience and those of their fellow decision makers to identify, consider, evaluate and either accept or reject options for potential solutions.

- Participants considered one option at a time rather than several at a time.

- Many participants matched their current situation with previous experiences, so were able to anticipate the decision outcome and project what might happen.

Work Roles

Managers' Roles

Mintzberg (1973) groups managers activities into three roles:
Interpersonal roles, arising from formal authority and status and supporting the information and decision activities, including figurehead, liaison, leader.
Information processing roles, including monitor, disseminator, spokesman
Decision roles, involving significant decisions, including improver/changer, disturbance handler, resource allocator, negotiator.

- With the exception of participants who were board members, all participants' roles with respect to the decision could be easily classified within one or more of three broad categories of Mintzberg's managers' roles - interpersonal, decisional or informational.

- Only participants in senior positions in the organization took the role of spokesman for the organization.

- No participant described their role as figurehead.

- No participant in a senior position described their role in a way that could be classified as disturbance handler, although participants at all other position levels did.

- No participant described their role as negotiator, but several participants contracted with external facilitators to help reach consensus on a decision.

> **Interpersonal - Leader:** *…and maybe my staff don't like working after 3:00 in the afternoon … there is no way around that.* (Manager)
>
> **Informational –Monitor:** *…people are reporting to us what almost happened, and consequently would identify things that almost happened…* (Director)
>
> **Decisional – Improver/Changer**: *… so [I] have been involved in that whole new program which is based on research … on what children need to have a healthy early childhood...* (Director)

Knowledge and Information that Influenced Decisions

- Participants described how a variety of different types of information, knowledge, and other considerations influenced their decisions.

- Participants tended to identify one possible solution to their decision at a time. They would explore how well that solution might work unless/until they encountered knowledge or information that suggested it was not a good solution.

- All participants were influenced in their decision making by knowledge or information connected to or arising from a variety of considerations. These included congruence between the potential solution and organizational values, such as respect and accountability, or considerations such as mission and vision, quality, risk, ethics and safety.

- If a potential solution conflicted with organizational values, if it wasn't safe or ethical, if it contravened any regulation, if resources weren't available to implement or sustain it, it blocked a decision continuing along a particular path.

- Senior participants stressed the importance of knowing the organizational culture, its receptiveness to proposed change, and the value of not trying to make change happen when the organization is not ready.

- Some participants described aspects of their organizational culture that would be obstacles to a particular solution to just this particular decision at the particular time. These are situational variables.

- Some participants described aspects of their organizational culture that would be pervasive obstacles to other related decisions being made in the organization
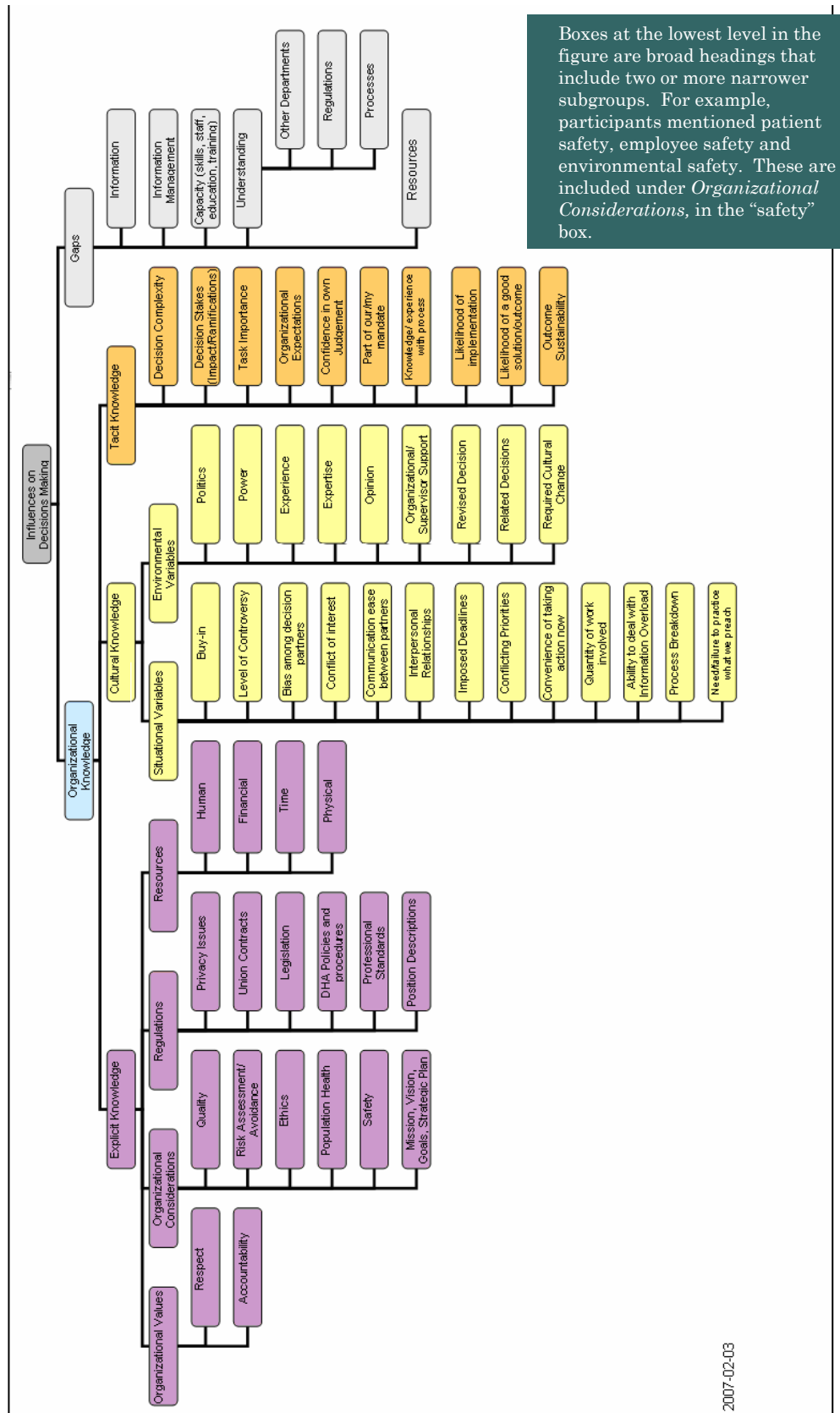
Boxes at the lowest level in the figure are broad headings that include two or more narrower subgroups. For example, participants mentioned patient safety, employee safety and environmental safety. These are included under *Organizational Considerations*, in the "safety" box.

Figure 1. Different types and sources of information and knowledge that influenced participants' decisions.

over the same general time period. These are environmental variables.

- All participants who identified gaps in internal information during the decision process, whether these were in information, information management, resources, understanding or capacity, tried to bridge these to their satisfaction. They were uncomfortable in moving forward with the decision without doing so, but sometimes had no choice.

- All participants who referred to *likelihood of successful implementation* and *sustainability of the proposed decision solution* considered these to be crucial factors in choosing a solution.

> **Organizational Principles:** …*so when we make decisions we certainly look back at the mission, vision and values (Manager)*
>
> **Regulations:** …*if we are looking at a project, or whatever we will look at what the regulatory bodies say first… (Director)*
>
> **Timing:** *… even though you have all of the information, that you could have moved forward 5 years ago with it … if it is not broadly accepted… it is very hard to affect an overall change.* (Director)
>
> **Sustainability:** *I am somewhat concerned about the sustainability of it, when we move this forward. I am concerned that we will start something that we won't have the human resources to keep going (Director)*

Enough Information

> *I said I didn't find all the information that I needed. I still don't have other policies and procedures that I wish that I had. I think I did an ok job. (Manager)*
>
> *There is also a time sensitivity to this … a decision on time is better than the right answer too late... all tied up in a nice bow … (Senior Executive).*

- All participants made the best decision they could with the information and time available, balancing objectives with least expenditure.

- The majority of participants said that they were comfortable with their decision although they didn't have all the information they would have liked. They deliberately chose to make a good enough decision in time to make a difference, rather than a perfect decision too late.

- Many participants said that the frequency of unexpected, imposed deadlines limited their information seeking and so may have an adverse impact on the quality of their decision making.

Theme Two: Information and Sharing

Motivation to Share

- Several participants who said they gathered and shared information with other staff did so to help improve a situation, or because they had expertise in an area, or to get feedback on the quality of information they wanted to share themselves.

- Some participants described being asked for information, including information outside what they might consider to be the scope of their current position and in response actively searched for information for colleagues and filtered that information for them through their own knowledge with respect to the particular decision situation.

Method of Sharing

- Most participants shared information orally, including conversations with individuals and through discussion at meetings.

- Some participants shared information in writing, including by email and posting documents on shared network drives.

Origin of Shared Information

- Some participants said that information they shared came from personal opinion, observations and experiences.

- Some participants said they shared information from the literature, and from written internal reports.

- Participants noted the need to keep up in the literature related to their field.

- Most participants said they both monitor the literature and search as needed.

- A majority of participants said they have trouble keeping up with the literature.

- One participant said that keeping up with the literature should be recognized as a management responsibility and time allotted to it, and noted that some staff members perceive reading the literature as a less valuable use of time.

Credibility

Most participants used observation, and their own experience, instinct and intuition to guide choice of people they asked to provide them with oral information. No participant mentioned using more formal guidelines to establish credibility of oral information.

Some more experienced participants said that they had no difficulty identifying which

colleagues would provide credible information and which did not keep up to date and would provide superfluous or out of date information.

> *There are some people, if they told me something, I would take it with a grain of salt and would question where they got their information. There are other people that I have respect for and know their information …is very reliable. (Director)*

Several participants in more senior positions mentioned that they were frequently asked for information, but were not always comfortable giving it because they weren't able to find time to keep up in their fields.

Theme Three: Information and Seeking

Characteristics of Seekers

- All participants described situations where some degree of uncertainty prevailed. All asked questions and looked for answers to reduce their uncertainty.

- Many participants noted that supervisor support in the decision situation, and their supervisor's interest in any information gathered influenced their own perception of task importance and their own level of effort in information searching.

- The majority of participants noted that searching for information to support decisions and tasks took less effort when they had previous related experience.

- Most participants noted that the less directly relevant experience they had, the more effort was required in searching for and using information.

- Collectively, participants described looking for information at twenty different points during the four phases of the rational decision making model, as shown in Figure 2. However, no one participant noted they looked for information at all twenty points.

- All participants looked for information in Phases I and II.

- Not all participants looked for information in Phase III.

- Only several participants described a Phase IV where the decision was implemented and evaluated. Some cases had not been concluded by the time of the interview; in others the decision process had paused or stopped.

- Participants with more years of career experience tended to look for specific information first.

- Participants with fewer years of career experience tended to search broadly first and then drill down to specific information.

Role of Information

- Participants sought information to solve problems, answer questions, address incomplete information and generally reduce uncertainty.

- No participant said that they found new research-based information that made a difference to decision outcomes.

Characteristics of Sources

- The majority of participants looked for background, mostly internal information from interpersonal sources in Phase II, and then "drilled down" to look for answers to specific questions or information to bridge information gaps in Phase III.

- The majority of participants reported consulting interpersonal sources first.

- Interpersonal sources consulted were people with both expertise and experience who would likely already have and understand the information needed, who would synthesize it with respect to the situation and provide it orally to them.

- Interpersonal sources consulted were generally people one or two levels above or below participants in the organization chart, or people in other departments with in-depth knowledge of both the subject and the situation, or peers in other organizations, or consultants contracted to support the process.

- The working definition of
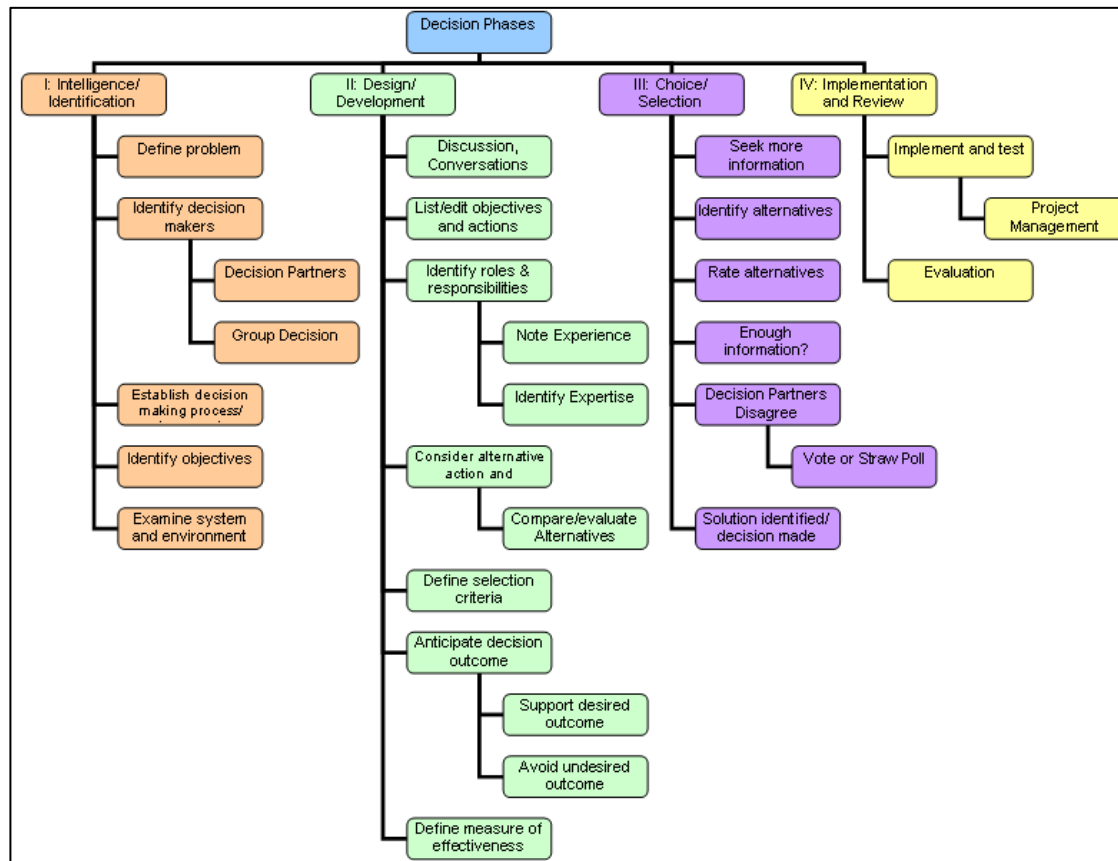
Figure 2 - Categorical Diagram for Knowledge and Information Use within Decision Phases

internal information at the beginning of this study was "information created within the organization"; *external information* was "anything created outside the organization". Most participants also considered information that had already been used or applied within the organization as internal information, including relevant legislation and professional standards.

- A number of participants looked specifically for written internal information and reported not being able to find what they expected should be available.

- Some participants did use research information to support decision making, but not all did.

- Some participants considered new, research based information in early stages of their decision if they or the people they asked for information already knew about it.

- Many participants did not specifically search for research information related to their situation.

- Some participants considered new research-based information after their more basic internal information needs were met.

- Some participants looked for new research-based information in Phase III to help them make improvements to their situation or service beyond solving the problem.

- When participants did not have time to look for new research based information, it did not hinder their progress in moving forward with a decision.

- Some participants said they would search for research based information only if they knew it would change their decision. 318

- No participant indicated that their consideration of new research-based information made a difference in the decision outcome.

- Some participants were comfortable searching for information themselves and tended to do that. Others used information intermediaries to gather information for them.

- If information they identified as required was not gathered and presented back to them very quickly, some participants did not have time to review it.

- A majority of participants preferred to read printed information over electronic information.

- A majority of participants preferred to receive written information electronically rather than on paper.

- A majority of participants preferred information synthesis and summaries over raw research information.

- Some participants preferred oral stories and anecdotes over printed research information.

Information Use - Barriers and Challenges

Barriers to Information Seeking

Wilson (1996) called these intervening variables, grouped as follows:

Personal characteristics
Cognitive dissonance
Selective exposure
Physiological, cognitive and emotional characteristics
Educational level and knowledge base
Demographic variables: age, sex & other factors

Economic barriers

Social/interpersonal barriers

Environmental/situational barriers
Time
Geography
National cultures

Information source characteristics
Access
Credibility
Channel of communication

• Of the barriers to information seeking identified in the literature, no participant suggested that personal barriers or characteristics, emotional variables, demographic variables, social/interpersonal variables or source characteristics, including credibility and channels, presented them with obstacles or challenges in information seeking or information use.

- Most participants noted that lack of time was a barrier to information use, including time spent looking for information and time spent reviewing information found by intermediaries.

- Some participants noted that the single most important barrier to effective information seeking was the lack of availability of systematically planned integrated health information management infrastructure.

- Many participants said their chief information need in decision making was performance or workload data on their own staff. No participant had all of this type of information they needed at the time of the interview, and most had no information.

- Some participants noted that less than optimal staff capacity to search for and manage information was mentioned frequently as a barrier to information seeking and organizational development.

- Research based information was not always found to be relevant to local contexts and situations. Some participants saw their geography as a barrier to information use in that there are fewer publications about healthcare issues written from the Canadian and Nova Scotia perspectives.

- Some participants believed research based information might not apply in rural settings.

- Some participants saw economic barriers to effective information use manifested organization-wide in limited access to technology and lack of information management services.

We are trying to gather information on [clinic utilization] and figure out how to interpret information - we don't have as much information and are not 100% sure of what it means. (Director)

I ask for [data] on a quarterly basis and they always forget to send it to me. So I call them and then they send it to me for the whole district. So that is useful to me, it should be by site, and I have to go through it line by line if I want it. If I want stats for a certain department, I can't do it … I would have to … think for every single name look up every single department (Other Leader)

- Some participants saw slow uptake of technology as a barrier that bridged education, geographic and environmental variables. In part this was due to some staff members not having access to networked computers, and some healthcare consumers in the District still without high speed Internet access.

Theme four: information and population health

- Some participants have had a solid understanding of population health throughout much of their career.

- A majority of participants indicated that they had developed an understanding of population health over the previous several years.

- A minority of participants stated they were still not completely clear on its meaning or value to them.

- Participants at higher levels in the organization in all portfolios stated they had a good understanding of population health.

- Population health was commonly understood and applied by participants in the Community Health portfolio.

- Population health was also understood by a majority of other participants but not necessarily applied.

- When asked about opportunities for population health-related education, most participants reported they had been exposed to concepts at least once.

- Most participants had been offered population health related education.

- Some participants perceived population health as limited in its applicability throughout the organization.

- Some participants gave examples of applying a population health approach to decision making without labeling it as such.

Methods

Study Questions:
  In what roles are healthcare managers engaged when faced with making decisions?
  Are these healthcare managers similar to general managers as described in the literature?
  What are their decisions about and how do they approach them?
  Is there a relationship between how well internal information is managed and made accessible, and decision makers' use of external research-based information?

Approach: Qualitative

Data Gathering: 19 semi-structured interviews, with a warm up question and discussion
  About the critical incident
  General information seeking
  Knowledge and application of population health

Participant Selection:
  By employer - 1 District Health Authority (DHA) or shared by 3
  By position - level on the organization chart
  By portfolio (health services work area)

Data Analysis & Synthesis:
  Taped interviews transcribed verbatim, then categorically indexed (521 terms) using ATLASti
  NATCEN 'Framework' for cross case synthesis

Data Reporting:
  Integrated results and discussion
  Explanations supported with quotations or research literature.

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Accountability

Respect

Other Organizational Values

Quality

Risk Assessment/ Avoidance

Ethics

Population Health

Safety

AVH Value - Accountability

We make rational, informed decisions based on evidence and we are accountable for our actions and effective sustainable management of resources.

In any problem or decision related to one of your areas of responsibility or where you have a leading role, to what degree would you want to know about any information that would have an impact on your ability to be accountable for your decision. For example, it might be about some part of the decision outcome that you could not control yourself that might have a negative impact somewhere within the organization.

AVH Value - Respect

We are committed to working in ways that promote dignity, fairness and respect.

In any problem or decision related to one of your areas of responsibility or where you have a leading role, to what degree would you want to know about any information that would influence respect given to others, or perceptions about respect given to others. For example, it might be finding out about closely-related work previously completed by others and involve including them going forward.

Other AVH Values – Integrity , Collaboration, Continuous Improvement, Innovation

In any problem or decision related to one of your areas of responsibility or where you have a leading role, to what degree would you want to know about any information related to it that have a bearing on other AVH Values - ethical and professional conduct, working together with our communities and other partners, quality and evaluation and change and improvement by fostering learning, inquiry and discovery. It is any information that would lead you to see your solution in a positive or negative light.

One definition for Quality is *"The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge".* In any problem or decision related to one of your areas of responsibility or where you have a leading role, to what degree would you want to know about any information that would contribute to your assessment of how well the decision or solution fit within the quality framework, or would contribute to your assessment of its quality.

RISK: In any problem or decision related to one of your areas of responsibility or where you have a leading role, to what degree would you want to know about any information related to how your solution or decision would increase or decrease risk associated with the issue.

Ethics: In any problem or decision related to one of your areas of responsibility or where you have a leading role, to what degree would you want to know about any related information related to ethics or about perceptions about ethics with respect to the decision.

Population Health information includes anything that has a bearing on the issue related to health promotion, disease prevention and information on any one of a series of health determinants - social, economic and physical environmental factors that contribute to our collective health. It might be medical knowledge, or information about medical and biological status, or lifestyle choices related to the situation, or demographic or epidemiological data on the population being considered.

In any problem or decision related to one of your areas of responsibility or where you have a leading role, to what degree would you want to know about anything that might have a bearing on safety, whether patient safety, staff safety, and environmental safety.

Mission, Vision, Goals, Strategic Plan

Privacy Issues

Union Contracts

Legislation

Professional Standards

DHA Policies and procedures

Position Descriptions

Human Resources

AVH Mission, Vision, Values, Strategic Plan
In any problem or decision related to one of your areas of responsibility or where you have a leading role, to what degree would you want to know about anything that had a bearing on, supported or conflicted with the District Mission, Vision, Values or Strategic Plan.

Privacy legislation, compliance with privacy legislation and individual perceptions about privacy may have an impact on your decision or problem. If there is information related to any aspect of privacy, would you want to know about it?

Union contracts spell out terms of employment for various groups. If there is anything in any contract that would have a bearing on your issue, would you want to know about it?

Legislation: Government legislation at any level, federal, provincial or municipal, may be relevant to your issue. If there is any legislation or associated regulations related to your situation, would you want to know about it?

Professional standards: Professional groups develop various kinds of standards including patient care standards, building and maintenance standards, service delivery standards and others. If there are any standards related to your issue, would you want to know about them?

Policies and procedures provide the operating framework for an organization. If there were any policies or procedures that were related in any way to your issue, would you want to know about them?

Position descriptions lay out position scope and responsibilities. If you were expecting certain staff to be involved in implementing or sustaining your decision and there was something in any of their position descriptions that had a bearing on that, would you want to know about it?

Human resource capacity: if there was information on the capacity of people you expected would implement or sustain your decision, whether it was time available or the skill set to do the work, would you want to know about it?

Financial Resources

Time Resources

Physical Resources

Buy-in

Level of Controversy

Bias among decision partners

Conflict of interest

Communication ease between partners

Financial resources: if there is any information about financial resources available to implement or sustain your decision, would you want to know about it?

Time: if there is information about time lines and time needed to implement or sustain your decision, would you want to know about it?

Physical resources: if there is information about space and equipment needed to implement or sustain your decision, would you want to know about it?

Buy-in: If there is information about how people involved in any aspect of implementing or sustaining your decision or solution, would you want to know about it?

Controversy: If there your issue is controversial, would you want to know about it?

Bias among partners: if anyone involved in your issue has a bias about it, about your decision or about your solution, would you want to know about it?

Conflict of interest: sometimes decision makers and stakeholders will be conflicted about issues, perhaps two departments are competing for funding, and there is a family member with a business related to the issue. If anyone directly involved in your decision or problem has a conflict of interest, would you want to know about it?

Communication ease between partners: Sometimes staff in different departments has difficulty understanding each other – they speak different languages. If there were information about communication between people involved in making, implementing or sustaining the decision or solution, would you want to know about it?

Interpersonal relationships

Conflicting priorities

Imposed Deadlines

Convenience of taking action now

Quantity of work involved

Information Overload

Process Breakdown

Failure to practice what we preach

Interpersonal relationships can have an impact on problems and decisions, the nature of the resolution as well as its implementation and sustainability. If your issue will be affected by interpersonal relationships, whether the relationships are very positive and will be of benefit, or negative and detrimental, would you want to know about them?

Conflicting priorities: Competition for resources, including time, space, staffing and budget, may be complementary – perhaps one clinic space can serve two needs. At other times, needs will conflict, and space must be assigned to one and not another. If there are other issues in play that will conflict or compete with yours, would you want to know about them?

Imposed deadlines: Imposed deadlines are not unusual in healthcare services. Some of these such as those related to business planning are expected while others arise unexpectedly. There will likely be deadlines associated with making your decision or solving your problem. If some of the people involved in your decision will need to meet other deadlines during the same time period, would you want to know about them?

Convenience of taking action: Timing is everything. Just as it would be more convenient to replace a roof in June rather than January, it might be more strategic to address a particular initiative when dealing with a series of related issues. Or it may be that there is the intention to address one or more initiatives in the future and your issue would be easier to manage if addressed at the same time. If there is information about timing and convenience of taking action on your issue, would you want to know about it?

Quantity of work: Sometimes it is difficult to accurately assess the amount of work and the resources and skill sets needed to implement or sustain an issue. It is also difficult to get information on capacity – how much work can individuals manage – and what other work are they doing. If information related to the quantity of work was available on your issue, would you want to know about it?

Information overload: this card is about information rather than information itself. Sometimes there is so much information to get through about an issue that managers get stuck and the decision is delayed or deferred. If this were the case with your decision situation and people working with you felt that there was just too much information to get through, how would you consider that? Please sort accordingly.

Process breakdown: If the process to follow to get a decision implemented or a problem solved is new or unfamiliar or changed, it may not work smoothly. Some process breakdowns can be anticipated. If there is information available to suggest how to best approach a specific process to avoid breakdown, or if someone knowledgeable can advise how to avoid process breakdown, would you want to know about it?

Failure to practice what we preach: Sometimes there is a perception that we fail to practice what we preach, that we write policies and guidelines but don`t follow them. If your issue is one where some staff involved might feel that no matter what happens, leadership will fail to follow through, would you want to know about it?

Politics

Experience

Power

Expertise

Related Decisions made

Required Cultural Change

Revised Decision

Organizational/ Supervisor Support

Politics: Every decision or problem might be affected by politics, either big P politics where local, provincial or federal government decisions have been made, or organizational politics. If there were any kind of political considerations related to your issue, would you want to know about them?
Experience: if it happened that you are new to the issue you are addressing but someone else in the organization has experience and knowledge about it, would you want to know about it?
Power: there may be someone either inside your organization or outside of it who can move it forward more quickly or tell you how to move it forward and support you on that. There may also be individuals who can effectively block progress. If there were individuals who have power related to your issue, would you want to know about them?
Expertise: Some peoples are experts on an issue because they have studied it thoroughly and handled it successfully. Others know a great deal about an issue and can speak with authority on it. If there were people with expertise related to your issue accessible to you, would you want to know about them?
Related decisions made: sometimes parallel initiatives result in related issues being addressed at different times by different people. If there are or have been similar decisions and problems to yours, would you want to know about them?
Required cultural change: Sometimes resolutions that seem straightforward are difficult to implement or sustain because the organization is not ready. Sometimes a departmental or organizational culture will need help absorbing and accepting a change. If there is information to explain why your decision or issue will require a cultural shift, would you want to know about it?
Revised decision: Some decisions are made and then not implemented or sustained. If your issue had already been addressed and resolved, and either not implemented or the implementation didn't work out, would you want to know about it?
Organizational and supervisor support: sometimes we take action, at least initially, with minimal support from our supervisors or the organization. If you are involved in an issue and either your supervisor or the organization in general has made a decision on how they value the time you invest in it, would you want to know about it?

Decision Complexity

Decision Stakes
(Impact/Ramifications)

Task Importance

Confidence in
Judgement

Organizational
Expectations

Outcome
Sustainability

Knowledge/experience
with process

Part of our/my
mandate

Decision complexity:
Some decisions are operational, affecting the only immediate situation while others may be strategic, long term and far reaching, or tactical, made in support of other strategic decisions. Many decisions that healthcare services managers make are complex in that they involve two or more levels. If there was information about your decision or problem that changed your understanding of its complexity, would you want to know about it?

Decision stakes – impact ramifications
Managers faced with a problem or decision want to accurately assess its importance and ramifications. If there was knowledge or information within or outside the organization that would contribute to what you know about your issues` importance and the ramifications of the decision or solution, would you want to know about it?

Task importance: There are always conflicting priorities among crises, problems that might become crises if not addressed, and opportunities to make improvements that move the organization forward. As you are making your decision or solving your problem, you will assign an importance to the task relative to the other work you need to do. If you could find out what importance your supervisor and other leaders in the organization assign your issue, and what importance others involved in implementing and sustaining it will assign it, would you want to know?

Confidence in judgement
Making decisions and solving problems, either with a group or individually, draws on judgement. You will realize a degree of confidence in your own judgement. would you want to know what confidence your supervisor and leaders in the organization have in your judgement or what confidence members of the group involved in making the decision have in the group`s judgement?

Organizational expectations
Sometimes problems and decision situations arise in a single department or service before others in the organization are conscious of them. At other times, leaders are anticipating issues and form expectations about how they should be addressed. If leaders in your organization have expectations about how you will address your problem or decision, would you to know about it?

Outcome sustainability
Once a solution or decision has been implemented, it will likely need to be sustained. If there is information available about the resources needed to sustain your problem or decision and their continuing availability, would you want it?

Mandate: Sometimes it is unclear as to whose jurisdiction a particular issue falls within, whether it is one DHA department or another, or one government department or another. If information to clarify mandate was available that related to your problem or decision, would you want that?

Your problem or decision may involve engaging in new or unfamiliar processes. If there was written information about these processes that would help navigate through them, or you could ask someone who successfully used these processes, would you want that information?

Likelihood of a good solution/outcome

Likelihood of implementation

Past Investment and ROI

Costing Studies

Evidenced Based Research

Utilization Data

Epidemiology

Demographics

Likelihood of implementation
Once a solution has been identified or decision reached, it will need to be implemented. If someone with experience and expertise related to the issue who knows your situation and its context could tell you what they believe is the likelihood that the decision will be implemented, would you want that information?

Likelihood of Good outcome
Once a solution or decision has been implemented, it will likely be evaluated either formally or informally to determine whether it has had a positive outcome. If someone with experience and expertise related to the issue who knows your situation and its context could tell you what they believe is the likelihood of a good outcome, would you want that information?

There may be information about resources invested in areas directly related to your problem or decision, either in your DHA, in the province or elsewhere in Canada. And there also may be some analysis done on the return on that investment. If this information was available related to your problem or decision, would you want to see it?

Likelihood of implementation
Once a solution has been identified or decision reached, it will need to be implemented. If someone with experience and expertise related to the issue who knows your situation and its context could tell you what they believe is the likelihood that the decision will be implemented, would you want that information?

There are various kinds of costing studies – cost benefit analysis are hard to do in clinical care because it is hard to value human life and quality of life, but there are other ways to compare costs of alternatives you might consider as you think about your problem or decision. If directly related costing studies are available, would you want to see them?

Evidence based research may be clinical or nonclinical and would come from studies designed and conducted using proper research and analysis strategies. The information would be objective and accurate as possible, and probably comparative, telling you which of two choices would be best in a given situation. It would be related to your decision situation or problem but probably not directly relevant to your context and culture. Evidence based information is free of biases and other noise. If there is research evidence available, would you want to see it?

Utilization data would give you information on past transactions and use of program or service resources related to your problem or decision. Would you want to see directly related utilization data?

Epidemiological information will include factors related to your decision or **problem that will** affect health and illness of populations. It may suggest whether interventions made related to disease prevention and health promotion are logical. Your problem or issue may not be a clinical one. It could be, for example, a decision on the height of a smoke stack or a decision to replace a filing system with a computer. Yet there may be relevant epidemiological information – if there is, would you want to see it?

Demographics are population numbers, generally Age, Sex / Gender, Race/ Ethnicity, Education, Location of residence, Socioeconomic status (SES), Income, Employment status, Religion, Marital status, Ownership (home, car, pet, etc.) Language and Mobility. If your decision or problem involves people, whether members of the public or healthcare workers, as you make your decision would you want to have any these figures that are relevant?

Existing Programs and Services

Local Community Organizations

Expert Opinion

Public Opinion

Existing programs and services. There may be government, nonprofit or for-profit services and programs in your community engaged in activities that are directly related to your problem or decision situation.   As you make your decision, would you want to know about them and what they do?

Local community organizations.
There may be organizations such as service groups, self help groups, health charities or other organizations active in your community. As you make your decision, would you want to know about them, group mandate and size, how frequently they meet, what their activities are?

Expert Opinion would be information related directly to your issue or problem contributed by one or more individuals who are respected authorities on the subject. They are recognized as having this expertise and their expert opinion is general – it is not being offered with consideration to your particular situation. They do not know the details of your problem or situation.

Public Opinion would be information on what members of the public think with respect to the issue. It could have been gathered by a community health board or by the media or some other way. It could represent opinions of the entire community or specific subgroups.

Appendix G. Tables from the Second Interview Study

Table G-1 "Need to Know" values assigned in the Card Sorting Exercise

			Times Chosen		
Category	Subcategory	Information Type	Need to know	Nice to Know	Not Essential
Explicit	Organizational Values	Accountability	16	1	
Explicit	Extras	Evidence based research	16		1
Explicit	Organizational Considerations	Quality	16		1
Explicit	Organizational Considerations	Safety	16		1
Explicit	Resources	Financial resources	16	1	
Tacit	-	Decision stakes (impact, ramifications)	16	1	
Tacit	-	Organizational expectations	16	1	
Tacit	-	Part of my/our mandate	16		1
Cultural	Situational Variables	Imposed deadlines	15	2	
Cultural	Environmental Variables	Experience	15	2	
Explicit	Extras	Epidemiology	15	1	1
Explicit	Organizational Considerations	Ethics	15	2	
Explicit	Organizational Considerations	Risk assessment and avoidance	15	2	
Explicit	Regulations	DHA policies and procedures	15	2	
Explicit	Regulations	Mission, vision, goals, strategic plan	15	1	1
Explicit	Resources	Human resources	15	2	
Explicit	Resources	Time resources	15	2	
Cultural	Environmental Variables	Power	14		3
Explicit	Extras	Demographics	14	2	1
Explicit	Organizational Values	Respect	14	1	2
Explicit	Organizational Considerations	Population health	14	3	
Explicit	Regulations	Legislation	14	3	
Explicit	Regulations	Union contracts	14	1	2
Explicit	Resources	Physical resources	14	3	
Tacit	-	Knowledge, experience with process	14	3	
Cultural	Situational Variables	Buy-in	13	4	
Cultural	Environmental Variables	Expert opinion	13	4	
Cultural	Environmental Variables	Expertise	13	3	1
Explicit	Extras	Existing programs and services	13	2	2
Explicit	Extras	Utilization data	13	3	1
Explicit	Organizational Values	Other organizational values	13	3	1
Explicit	Regulations	Professional standards	13	4	

Appendix G. Tables from the Second Interview Study

Category	Subcategory	Information Type	Times Chosen		
Cultural	Situational Variables	Organizational/supervisor support	12	4	1
Cultural	Environmental Variables	Conflict of interest	12	5	
Cultural	Environmental Variables	Information overload	12	3	2
Explicit	Regulations	Privacy issues	12	4	1
Tacit	-	Outcome sustainability	12	4	1
Tacit	-	Task importance	12	4	1
Cultural	Situational Variables	P/politics	11	6	
Cultural	Situational Variables	Required cultural changes	11	6	
Cultural	Environmental Variables	Conflicting priorities	11	5	1
Cultural	Environmental Variables	Quantity of work involved	11	6	
Tacit	-	Confidence in judgment	11	6	
Cultural	Situational Variables	Communication ease among partners	10	6	1
Cultural	Situational Variables	Level of controversy	10	7	
Cultural	Situational Variables	Process breakdown	10	6	1
Cultural	Environmental Variables	Revised decision	10	6	1
Explicit	Extras	Costing studies	10	6	1
Tacit	-	Decision complexity*	10	4	2
Cultural	Situational Variables	Bias among decision partners	9	6	2
Cultural	Situational Variables	Failure to practice what we preach	9	5	3
Cultural	Situational Variables	Interpersonal relationships	9	7	1
Cultural	Situational Variables	Convenience of taking action now	8	8	1
Cultural	Environmental Variables	Related decisions made	8	9	
Explicit	Extras	Community organizations	8	7	2
Explicit	Extras	Past investment and ROI	8	7	2
Tacit	-	Likelihood of implementation	8	8	1
Cultural	Environmental Variables	Public opinion	7	9	1
Explicit	Regulations	Position descriptions	6	8	3
Tacit	-	Likelihood of a good solution/outcome*	5	8	3

Table G-2 "Need to Know" values assigned in the Card Sorting Exercise

*Data were missing for values assigned to two information types

Table G-3 Pairs of information and information behaviours, by quartile

Behaviour	Paired with Information in the same transaction	Times Paired	Quartile			
			1st	2nd	3rd	4th
Answer questions	Evidence based research	2	1		1	
	Experience	1	1			
	Expertise	1	1			
	Human resources	1			1	
	Knowledge, experience with process	1			1	
	Part of my/our mandate	1		1		
Anticipate outcome	Decision making framework	1				1
	Human resources	1			1	
	Imposed deadlines	1			1	
	Invisible information	1				1
	Population health	1				1
	System stressors and pressure points	1				1
	Utilization data	1				1
Argue/defend	Communication ease among partners	1				1
	Conflict of interest	1				1
	Existing programs and services	1				1
	Legislation	1				1
Assess information for relevancy and credibility	Decision complexity	1			1	
	Knowledge, experience with process	1				1
	News media	1				1
	Population health	1			1	
	Stories of similar situations	1			1	
	Task importance	1			1	
	Utilization data	1			1	
Consider discuss and agree to go forward	Buy-in	1				1
	Conflicting priorities	1				1
	Decision complexity	1			1	
	Decision making framework	1		1		
	Ethics	1		1		
	Human resources gap	1	1			
	Invisible information	2		1		1
	Knowledge, experience with process	1			1	
	Level of controversy	1				1
	Likelihood of implementation	4				4
	Meeting records	1			1	
	Mission vision, goals, strategic plan	1				1
	P/politics	4				4
	Population health	1			1	
	Power	2				2
	Professional standards	1		1		

Appendix G. Tables from the Second Interview Study

	Report on status of current situation	1	1			
	Task importance	1			1	
	Time resources	1				1
	Utilization data	1			1	
Cross referencing	Convenience of taking action now	1				1
	Existing programs and services	1				1
Define concepts	Knowledge, experience with process	1				1
	Part of my/our mandate	1				1
Demonstrate best practices	Demonstrating best practices	1				1
	Demonstration of technical know how	1				1
Destroy information	Advertisements	1				1
	Content in popular magazines and web sites	1				1
Direct	Financial resources	1		1		
	Power	1		1		
Directive sharing	Conflicting priorities	1		1		
	Experience	1				1
	Expertise	1				1
	Quantity of work involved	1		1		
Disconnect - decision is revised; information sharing does not happen	Decision record - gap	1		1		
	Meeting record - gap	1		1		
Enlightenment	Decision complexity	1				1
	Decision stakes (impact, ramifications)	1				1
	Demonstrating best practices	1				1
	Demonstration of technical know how	1				1
	Understanding of best practices	1				1
Examine the system and its environment	Decision complexity	1				1
	Decision stakes (impact, ramifications)	2	1			1
	Human resources	1			1	
	Knowledge, experience with process	2	2			
	Population health	1		1		
	Task importance	1	1			
	Time resources	1	1			
Examine the system and its environment	Understanding other departments	1	1			
Explore/evoke preferences	Decision making framework	1				1
	Financial resources	1		1		
	Knowledge, experience with process	1				1
	Risk assessment and avoidance	1		1		
	Stories of similar situations	1				1
Factual	Report on status of current situation	1	1			
Filter /censor information	Advertisements	1				1
	Content in popular magazines and web sites	1				1
Identify commonalities between situations	Decision complexity	1				1
	Decision stakes (impact, ramifications)	1				1
Identify gaps	Costing studies	1			1	

	Decision complexity	1		1		
	Decision stakes (impact, ramifications)	2		1	1	
	Demographics	1		1		
	Financial resources	1			1	
	Gap	4		1	2	1
	Historical summary	1			1	
	Human resources	1				1
	Knowledge experience with process	1			1	
	Knowledge, experience with process	1			1	
	Process breakdown	1			1	
	Skills gap	1				1
	Time resources	1				1
	Utilization data	1			1	
Identify training	Other plans	1			1	
Identify goals and objectives	Evidence based research	1		1		
	Meeting records	1		1		
Information gathering	Buy-in	1		1		
	Conflicting priorities	1		1		
	Organizational expectations	1		1		
	Physical resources	1		1		
	Task importance	1		1		
Information gathering through visits	Existing programs and services	1				1
	Expertise	1				1
Information referral	Experience	1			1	
	Expertise	1			1	
Information referral	Knowledge, experience with process	1		1		
	Related decisions made	1			1	
Information search	Community organizations	1				1
	Conflict of interest	2	2			
	Conflicting priorities	1				1
	Expertise	1				1
	Information gap	1				1
	Mission, vision, goals, strategic plan	1		1		
	Physical resources	1		1		
	Related decisions made	1			1	
	Task importance	2	2			
	Time resources	2	2			
Information Seeking - Ask an Expert	Experience	1				1
	Expertise	1				1
Information synthesis	Conflicting priorities	1		1		
	Corporate score card	1	1			
	Mission, vision, goals, strategic plan	1			1	
	Operational plan	1			1	
	Opinion surveys	1	1			

Appendix G. Tables from the Second Interview Study

	Organizational performance evaluation	1	1			
	Quality plan	1			1	
	Time resources	1		1		
Information transfer	Content in popular magazines and web sites	1				1
	Demographics	1		1		
	Evidence based research	1	1			
	Experience	2	1	1		
	Expertise	2	1	1		
	Gap	2		1	1	
	Historical summary	2			1	1
	Imposed deadlines	1	1			
	Knowledge experience with process	1			1	
	Knowledge, experience with process	3		2		1
	Legislation	2	2			
	Meeting records	1	1			
	Process breakdown	1			1	
	Safety	1	1			
Innovate	Human resources	1		1		
Instrumental	Mission, vision, goals, strategic plan	1		1		
	Opinion surveys	1		1		
Investigate consequences	Knowledge, experience with process	1	1			
	Mission, vision, goals, strategic plan	1	1			
	Population health	1	1			
	Quantity of work involved	1	1			
	Risk assessment and avoidance	1			1	
Just in case information sharing	Task importance	1	1			
	Time resources	1	1			
Knowledge translation	Communication ease among partners	1		1		
	Human resources	1		1		
	Practical examples	1			1	
Make sense	Best practices	1	1			
	Evidence based research	1			1	
	Population health	1	1			
Outline essential information	Template for information sharing	1				1
	Understanding skills and capacity required	1				1
Prepare for meeting	Physical resources	1			1	
	Understanding goals and objectives	1			1	
	Understanding of best practices	1			1	
	Understanding other departments	1			1	
Problem identification	Community organizations	1		1		
	Costing studies	1			1	
	Course content	1			1	
	Decision complexity	1		1		
	Decision stakes (impact, ramifications)	2	1	1		

Category	Item					
	Demographics	1		1		
	Financial resources	1			1	
	Gap	1				1
	Human resources	2	1		1	
	Imposed deadlines	1	1			
	Knowledge, experience with process	2			1	1
	Mission, vision, goals, strategic plan	1		1		
	Other plans	1			1	
	Physical resources	1		1		
	Problem identification	1				1
	Public opinion	1				1
	System stressors and pressure points	1	1			
	Task importance	1	1			
	Time resources	2	1			1
Problem understanding	Course content	1			1	
	Decision complexity	1		1		
	Decision stakes (impact, ramifications)	1		1		
	Knowledge, experience with process	2			2	
	Other plans	2			2	
	Public opinion	1				1
	Understanding other departments	1	1			
Projective future oriented	Knowledge, experience with process	1		1		
	Operational plan	1				1
	Population health	1		1		
Reduce uncertainty	Cultural competency	1		1		
	Evidence based research	2	2			
	Experience	1	1			
	Expertise	1	1			
	Human resources	1			1	
	Information gap	1		1		
	Knowledge, experience with process	1		1		
	Understanding other departments	1		1		
Report	Conflict of interest	1			1	
	Conflicting priorities	1			1	
	Corporate score card	2	1			1
	Experience	1		1		
	Expertise	1		1		
	Human resources gap	1		1		
	Knowledge experience with process	1		1		
	Knowledge, experience with process	4	1	2	1	
	Legislation	1	1			
	Likelihood of a good solution/outcome	1			1	
	Opinion surveys	1	1			
	Organizational performance evaluation	1	1			

	Part of my/our mandate	1	1			
	Physical resources	1		1		
	Professional standards	1			1	
	Report on status of current situation	3	2	1		
	Rumours	1	1			
	Understanding other departments	1		1		
Report on status of current situation	Decision complexity	1		1		
	Decision stakes (impact, ramifications)	1		1		
Satisficing	Knowledge, experience with process	2			1	1
	Other organizational values	1			1	
	Professional standards	1			1	
Seek approval	Convenience of taking action now	1				1
	Knowledge, experience with process	1				1
	News media	1				1
	Revised decision	1				1
Seek alternatives	Decision making framework	1				1
	Knowledge, experience with process	3	2			1
	Stories of similar situations	1				1
	Understanding other departments	1	1			
	Utilization data	1	1			
Set priorities	Conflicting priorities	1		1		
	Demographics	1		1		
	Evidence based research	1			1	
	Existing programs and services	1			1	
	Gap	1		1		
	Organizational expectations	1			1	
	Task importance	1			1	
	Time resources	1		1		
Situation monitor	Human resources gap	1	1			
	Operational plan	1				1
	Report on status of current situation	1	1			
Social sharing	Costing studies	1				1
	Decision complexity	1				1
Strategic sharing	Knowledge, experience with process	2		1		1
	Organizational expectations	1		1		
	Population health	1		1		
	Public opinion	1			1	
	Related decisions made	1			1	
	Rumours	1		1		
	Stories of similar situations	1			1	
	Understanding other departments	3		1		2
System analysis	Understanding other departments	1		1		
Take action	Community organizations	1		1		
	Demographics	1		1		

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	Evidence based research	1			1	
	Existing programs and services	1			1	
	Human resources	1			1	
	Organizational expectations	1			1	
	Task importance	1			1	
Teach/train	Demonstration of how something works	1		1		
	Information overload	1	1			
	Stories of similar situations	1		1		
	Template for information sharing	1				1
	Understanding other departments	1	1			
	Understanding skills and capacity required	1				1
Understand goals and objectives	Mission, vision, goals, strategic plan	1		1		
	Opinion surveys	1		1		
		317	65	82	78	92

Table G-4 Pairs of information and information behaviours, by quartile