

Outcomes of the 2003-2004 Rural and Northern Networks Funding Initiative

Summary Report

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This study was conducted at the request of the Health System Planning and Research Branch of the Ministry of Health and Long-Term Care (MOHLTC). The opinions and recommendations expressed in this report are those of the key informants and researchers, and do not necessarily represent the views of the Ministry of Health and Long-Term Care or the Centre for Rural and Northern Health Research.

Outcomes of the 2003-2004 Rural and Northern Networks Funding Initiative

Executive Summary

This report presents the main findings of a research project, the objective of which was to investigate the outcomes of the 2003-2004 Rural and Northern Network Funding Initiative (RNNFI)¹. The RNNFI was a \$10M incentive program designed to facilitate the implementation of hospital networks in support of the 1997 Rural and Northern Health Care Framework (hereafter, “the Framework”)². This study was commissioned by the Ontario Ministry of Health and Long-Term Care (MOHLTC).

The 2003-2004 allocation provided funds for 14 projects proposed by 18 hospital networks, with the majority of the projects focusing on the development and implementation of various types of health information technology (HIT). Projects funded under the RNNFI were to have been completed by early 2005. With nearly four years for networks to experience the effects of the funded projects, the MOHLTC wanted to know what had been achieved by this one-time targeted funding initiative. What are the perceptions of the impact of the RNNFI among recipients? Did the funded projects advance the vision of integrated and coordinated health networks established under the Rural and Northern Health Care Framework? If so, how? If not, why not?

Methods. The research used a multi-method, qualitative approach to review the outcomes of the RNNFI. The study was designed to interpret the outcomes of the RNNF Initiative, with the funded project as the unit of analysis. There were two main sources of data: project-related documents, and key informant interviews. The document inventory yielded limited project documentation, but did provide

important contextual information. Semi-structured interviews with key informants elicited respondents’ recall of the RNNFI, reasons for choosing to utilize the funds in the selected way (e.g. why information technology projects?), the current status of the projects funded under the RNNFI, how the supported projects advanced the objectives of the Framework, and perceptions of the impact of the one-time funding. Interviews were conducted in January-February 2009 with 12 key informants involving 4 northern hospital networks.

Study limitations. Turnover of key personnel since 2004 hampered efforts to locate documents as well as knowledgeable key informants, representing a significant loss of institutional memory. Among those contacted, low response rates and limited participation by some networks indicate that results cannot be characterized as either complete or representative of all projects. Key informant interviews focused on northern networks only (North East and North West LHINs). Also, because of the time lag between the development of proposals, project implementation, and this study, recall bias (as well as lack of recall) may have affected some key informant responses.

Main outcomes. Based on available data, funds were used as planned. “Funded projects” were usually a part of a larger network initiative, and some informants described the RNNFI funds as “seed money” or a “catalyst.”

All informants reported benefits from their funded project that advanced the larger network initiative. These network initiatives in

turn advanced four of the five goals of the Framework, which were to: develop/improve network IT connectivity; improve recruitment and retention of physicians and health professionals; form partnerships with other hospitals and community-based service providers in order to enhance access to health care services; and, promote efficient use of health care resources within the network. The only goal not addressed by the RNNFI (at least in the north), improving linkages to other community based providers, was a recommended “next step.”

Informants further identified specific ways that the completed network initiatives improved service access and patient care within the community. Some networks continue to work collaboratively, others do not; this was attributed to characteristics of the networks themselves, rather than the funded projects or the RNNFI *per se*. All identified specific benefits of the one-time funding approach, and indicated an unmet need for special projects funding.

Network benefits. All key informants agreed that the RNNFI was important and benefitted their network and communities. Small hospitals were seen as having benefitted the most from both the RNNFI and the network strategy, as they would not have been able to finance IT and connectivity projects on their own, nor would they have been able to maintain operations on their own. In a given network, the strategy of targeting resources to those with the greatest needs proved beneficial for all network members.

Sustainability. Reported threats to sustainability of hospital networks included difficulty obtaining funding for the ongoing network initiatives and lack of administrative support to the networks. The RNNFI funded projects that focused primarily on infrastructure rather than network

development, and did not build in sustainability. The goals of a funding initiative should take into consideration significant costs to grantees of sustaining the project (e.g., staff training and education, completion costs, technology purchasing and depreciation). These elements that support the goals of the initiative are worthy of funding as well.

Building on success. Future initiatives should build on existing relationships and successes. Some hospital networks are still functioning, especially in the north. The MOHLTC should view this as an important opportunity to build upon these strengths. There is a need for continuous collaboration and planning across jurisdictions (community, network, LHIN, MOHLTC, and OHA) to solicit recommendations, priorities for projects, and new policy directions. Continuing hospital network activities, providing administrative supports and collaboratively clarifying the role of hospital networks in the current Ontario health care landscape will help to capitalize on the successes to date.

Northern diversity. This report focuses mainly on hospital networks of northern Ontario. As such, the findings may be difficult to generalize to all networks across the province. While the north often distinguishes itself from the south, it is also important to note that the north itself is not homogeneous. Each northern network had its unique needs and challenges. The geography of northern Ontario posed some significant obstacles in the planning and completion of the network initiatives. For example, programming information systems in one of the northern networks needs to accommodate two time zones with two different sets of rules. Implementation of a common, connected information system in such a situation is exceptionally complex.

Need to strengthen evaluation. From the researchers’ perspective, there were indeed

many good reasons to examine the outcomes of a funding initiative from a longer-term perspective, particularly given that many of the funded projects are just now reaching the endstage and coming to fruition. Strengthening of monitoring and evaluation processes, particularly at the planning stage of a new program or initiative, would result in a stronger evidence base for future studies.

Flexibility is the key. Informants expressed appreciation for the flexibility of the design of the RNNFI program, indicating it as a key factor in their success. Future policies and programs affecting the northern hospitals need to acknowledge these significant differences by supporting initiatives which allow networks to self-define needs and respond to those needs with appropriate flexibility.

Main Messages

- All key informants agreed that the RNNFI was important, benefitted their network, and the flexibility in design of the grant program was effective. Projects did not always promote the sustainability of networks, however.
- Funds were used as planned. However, in no case did the grant finance the entire network initiative. Lack of funds resulted in significant delays in completing the larger network initiatives; some initiatives have only recently been completed.
- Once the entire network initiative was completed, key outcomes were improved service access and patient care within the community. Funded projects and network initiatives advanced four of the five objectives of the Framework and contributed to the early development of regional IT infrastructure and expertise.
- Small hospitals were seen as having benefitted the most from RNNFI, as they would not have been able to finance HIT projects or maintain operations on their own. Special initiatives targeting smaller organizations can benefit the entire network.
- The goals of future hospital network funding initiatives need to consider potential costs associated with project sustainability. Sustainability is essential for project success and maximizing efficiency of funds invested.
- Continuing hospital network activities, providing administrative supports, and collaboratively clarifying the role of hospital networks in the changing Ontario health care landscape will help to capitalize on hospital network successes to date.
- There is a need for continuous collaboration and planning across jurisdictions (i.e., community, network, LHIN, OHA, and MOHLTC), to solicit recommendations, priorities for projects, and new policy directions.
- The evidence base for this research would be improved by stronger monitoring and evaluation processes. Future initiatives should strengthen the definition of measurable indicators, monitoring plans, and periodic evaluations.
- Each northern hospital network had its unique needs and challenges. Flexibility is the key. Future policies and programs affecting northern hospitals need to acknowledge these significant differences by supporting initiatives which allow networks to self-define needs and respond to those needs with appropriate flexibility.

Outcomes of the 2003-2004 Rural and Northern Networks Funding Initiative – Summary Report

INTRODUCTION

This report presents the findings on a research project investigating the outcomes of the 2003-2004 Rural and Northern Network Funding Initiative (RNNFI, or the RNNF Initiative). The purpose of this study was to investigate what was achieved by the \$10M incentive program, designed to facilitate the implementation of hospital networks in support of the 1997 Rural and Northern Health Care Framework (hereafter, “the Framework”)².

The study is a qualitative review of the RNNFI as interpreted through documentary data and key informant interviews, with the funded project as the level of analysis. Research objectives were to (1) develop an inventory of hospital network projects funded by the RNNFI, through the collection and review of project-related documents; (2) identify relevant key informants from hospital networks through documents and snowball sampling; and (3) assess key informants’ perceptions of the results of the RNNFI through face-to-face or telephone interviews. A key focus was to explore whether and how the RNNFI advanced the objectives of the 1997 Rural and Northern Health Care Framework. The findings will be used to inform the development of future rural and northern healthcare policies.

BACKGROUND

As part of Ontario’s hospital restructuring process initiated in 1996, the Framework was a policy developed by the provincial Ministry of Health and Long-Term Care (MOHLTC) to improve the integration of hospital services under the Health Services Restructuring Commission (HSRC). The Framework was developed as a guide for the MOHLTC and partners to improve access to and quality of

health care in rural and northern Ontario, in part through the promotion of horizontal integration of smaller hospitals and vertical integration of different levels of care³. At the Federal level, the Commission on the Future of Health Care in Canada recognized the Framework and reiterated the importance of developing a networked system to link rural facilities, hospitals in regional centres, and tertiary care institutions in larger cities⁴.

With the Framework as its guide, the HSRC initiated its restructuring activities in rural and northern areas in 1998, to “*facilitate implementation of the Ministry’s framework for network development in all affected communities*”⁵. In June 1998, the HSRC proposed the membership of 18 hospital networks and related organizational structures, launching two rounds of feedback and reports that established the membership of hospital networks and the parameters for network activity. In the first round, the HSRC requested feedback by August of that year on proposed network membership and structures. Based on these responses, the HSRC issued another report in March 1999, finalizing network membership and outlining a framework for implementation. Hospital networks were to then report on progress made toward the development of network organizations and the development of plans for clinical and administrative coordination.

In the final “Advice and Recommendations” report to the Minister of Health⁵, the HSRC (2000) commented, “*It is impossible to overstate the importance of establishing a supporting infrastructure and creating strong incentives to achieve highly functioning hospital networks across the province. Both are*

central to rural and northern network development” (p. 8). The report contained recommendations to fund a network development grant program and a network infrastructure grant program (p. 6-7). The study also recommended that the role of tertiary hospitals in the networks be examined.

In August 2003, the Ontario Hospital Association’s Small Hospital Provincial Advisory Group (SHPAG) produced a report which provided recommendations for enhancing access to hospital and health services for residents of rural and remote northern communities ⁶. This report emphasized the importance of promoting and supporting the development of *“community-based rural, remote and northern health care delivery models that enhance integration and co-ordination of health services at the local and regional levels, emphasizing linkages through information and communications technology”* (p. 3). Additionally this report recommended adequate and appropriate funding, particularly for capital and operating costs.

In response to these recommendations, the RNNFI was launched by the MOHLTC, with a first-year allocation of \$10 million to be awarded on a year-to-year grant basis. Proposals were solicited in 2003, with the funded projects to be launched in 2004. In 2004, the Ontario Hospital Association (OHA) and the MOHTLC jointly reviewed the implementation of the Framework ⁷, *“to ensure its currency and to provide adequate guidelines for networks to move forward with implementation”* (p. 1). The report made several recommendations, including the recommendation that the \$10 million Rural and Northern Network Funding Initiative be continued.

The RNNFI was originally intended to be an ongoing source of grant support to networks. Although usually described as a “one-time funding initiative,” this appears to be often

misinterpreted as intended for a single year of funding. Projects were proposed and funded with the understanding that first-year projects (e.g. planning projects) would be evaluated and, if successful, would be eligible for the next round of funding. However, after the first year of funding, the funds budgeted for the networks grant program were reallocated to the base funding for small hospitals, and the RNNFI discontinued.

The 2003-2004 funding allocation provided funds for 14 projects proposed by 18 hospital networks, with the majority of the projects focusing on the development and implementation of various types of health information technology (HIT). Projects funded for 2004 were to have been completed by early 2005.

RESEARCH QUESTIONS

With nearly four years for networks to experience the effects of the funded projects, the MOHLTC wanted to understand the results of this one-time targeted funding initiative. What are the perceptions of the impact of the RNNFI among recipients? Did the funded projects advance the vision of integrated and coordinated health networks established under the Rural and Northern Health Care Framework? If so, how? If not, why not?

Table 1: Funded Projects

Hospital Network(s)		Project(s)	Allocation
1	Simcoe/Muskoka	QMPLS	\$600,000
2	Grey/Bruce	a. Lab Information System b. IT connectivity	\$782,000
3	Wellington	a. Network Integration b. Child and Adolescent Health Capacity Enhancement c. Services for Elderly (Jointly with Network 18)	\$545,625
4, 17	Haldimand/Hamilton & Brant/Norfolk	a. Mental Health b. IT Connectivity	\$375,167
5	Thames Valley	Lab Information System	\$1,300,000
6	Nipissing/Temiskaming	a. Phase I-Scoping of PAC system b. Phase II-Procurement Design	\$228,709
7a, 7b, 8, 16	West Ottawa Valley, East Ottawa Valley, West Champlain, & Cornwall Area	Regional Clinical Data Linkage Project	\$3,000,000
9	West Algoma	a. Electronic Health Record b. Strategic Planning	\$337,500
10	Huron/Perth	Lab Information System	\$224,200
12, 14	Northwest	Regional Electronic Health Record	\$1,547,799
13	Northeast	a. Lab Information System b. Common Credentialing	\$295,000
15	Alliston/Newmarket	PACs Connectivity	\$65,000
18	Dufferin/Northwest GTA	a. Clinical Services and Gap Analysis b. Enhance Mental Health Capacity c. Develop Palliative Care Model (with Network 3)	\$254,000
HKPR	Haliburton-Kawartha-Pine Ridge Joint Executive Committee (JEC)	Upgrading Digital Imaging Connectivity	\$445,000

RESEARCH DESIGN & METHODS

The research took a multi-method, qualitative approach to review the RNNFI. The study was designed to interpret the outcomes of the RNNF Initiative, with the funded project as the unit of analysis. There were two main sources of data, project-related documents, and key informant (KI) interviews. The research protocol was reviewed and certified by the Research Ethics Board at Laurentian University.

Document Collection and Review

From the outset of the project, very little documentation was available to the researchers regarding the funded projects. The MOHLTC provided a summary list of 14 projects that received funding, the networks associated with each project, and the amount of funding received (reproduced in Table 1, preceding page).

The first stage of the project was to develop a project inventory by collecting these documents directly from the hospital networks, for all 14 projects. The document request specified the following types of documents:

- The project proposal to the MOHLTC
- Midterm summary/evaluation report (due March 31, 2004 for most projects)
- Final summary/evaluation report (due March 31, 2005 for most projects)
- Any related correspondence, where appropriate

Written requests were mailed, or in some cases faxed or emailed, to the current Chief Executive Officer (CEO) of hospitals identified as “project paymaster” in the available funding letters. Where funding letters were not available, the request was addressed to the current CEO of the largest hospital in the network. Letters also asked for referral to appropriate persons in the event that the letter recipient was unable to respond. If documents were not received after two weeks, a follow-up request was made in writing, and a third request made after another

two weeks. A final follow-up request was made via telephone.

Because these documents were already several years old, the potential for success was uncertain and only a partial inventory was anticipated. Ten of the 14 projects responded and provided some documentation, however only four were able to supply the original project proposal, four supplied a final report, and only one was able to locate all the specified documents. Most attempted to supply what documentation they could find, which varied by network.

Based on available documentation, in some cases supplemented with information from other external reports, a summary was prepared for each funded project. These summaries provided context for the interviews, allowing the researchers to tailor the interviews to specific networks and projects. Additional questions specific to the network/project were prepared in some cases.

Key Informant Interviews

Semi-structured interviews with key informants were planned to elicit respondents’ recall of the RNNFI, reasons for choosing to utilize the funds in the proposed manner (e.g. why information technology projects?), the current status of the projects funded under the RNNFI, how the supported projects advanced the objectives of the Framework, and perceptions of the impact of the one-time funding.

Based on the project proposals, the broad objectives of the 1997 Rural and Northern Health Care Framework were identified as:

- Improve linkages to other community-based service providers
- Develop/improve network IT connectivity
- Improve recruitment and retention of physicians and health professionals

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- Form partnerships with other hospitals and community-based service providers in order to enhance access to health care services
 - Promote efficient use of health care resources within the network

Researchers then developed an interview question guide in consultation with the MOHLTC. Questions were intended to address informants' experience from the both the hospital and network level; no personal information was collected.

Recruitment of key informants. Key informant interviews were planned to elicit perceptions of network members of the outcomes and effectiveness of the RNNFI. Because the results are intended to inform rural and northern healthcare policy, this component of the project focused on the projects of networks located in the two northern LHINs. The goal was to investigate a minimum of five projects; however, one of the northern networks failed to respond to all contact efforts. Also, delays in obtaining Research Ethics Board certification reduced the amount of time to complete the research, thus key informant interviews were conducted with four networks, supplemented by interviews with other persons who were knowledgeable about the RNNFI and able to provide contextual information.

Project documents obtained in the inventory phase proved essential to the identification of potential key informants, in that the names of persons responsible for the projects were identified in these documents. Initial contacts and contact information were identified from documents collected during the inventory. A potential key informant list was drawn up for each project, with former and current CEOs, chief information/technology officers, relevant project managers, and other key hospital executives were identified for the initial list. The researchers were unable to locate current contact information for all identified persons. Because of the time lag between this

assessment and the planning and implementation of the projects, a key challenge involved the identification of personnel who may have had direct knowledge of, and involvement with, the projects. As anticipated, staff turnover at the hospitals was a significant issue.

Initial contact with potential informants was made via telephone. During this contact, a researcher screened for the informant's recall of the project, and if appropriate, requested permission to send an information package. Some interviews were scheduled at that same time; in other cases the researcher followed up with a phone call or email approximately one week after mailing the information package. The information packet contained a letter of introduction, an information and instructions sheet, a preview copy of the question guide, a "consent to participate in research" form, and a prepaid return envelope for the consent form. Per the research ethics protocol, a maximum of two follow-up telephone calls could be made to each potential informant, at which point a lack of response resulted in removal of the potential informant from the sample.

Once a key informant was identified for a given project, a snowball sampling approach was also employed to identify other potential key informants for each project. In many cases, the initial contact declined to participate and provided a different contact within the same hospital who was more directly involved in the project. Informants who participated in interviews were also asked to identify other knowledgeable persons within the network. As the initial contact was usually made at the larger urban referral hospitals within the network, emphasis was placed on recruiting key informants from smaller, rural hospitals within each network. Where documents and/or requests for referrals failed to yield a sufficient number of appropriate informants, a purposive approach was used to select hospitals (again with an emphasis on the smaller and more

remote hospitals in the network), and a researcher attempted to identify a knowledgeable person via telephone contact with a hospital administrator.

Informed consent. Informed consent procedures were planned to maximize convenience for respondents. Respondents were asked to complete and return the written consent form in advance via mail or fax. If an informant had not returned the written consent form before the scheduled interview, the interviewer obtained verbal consent by reading the consent form to the respondent and obtaining verbal agreement. The interviewer also requested that the informant complete the form at the same time and return it that day.

Sample size. The goal was to identify a maximum of 10 key informants as potential respondents, and complete 5 interviews per project. While the research team was able to meet the goal of potential key informants, the team succeeded in completing only 2-3 interviews per project. As anticipated, turnover of key personnel since 2004 hampered efforts to locate documents as well as knowledgeable key informants. Of 50 potential key informants that were contacted, 14 did not respond, and 18 declined to participate. Most declined on the grounds that they were not at the hospital or network at the time of the project, or simply did not recall the project or RNNFI. Two initially agreed to participate but later cancelled the interview, explaining that they did not feel comfortable answering the questions. Although the number of participants is smaller than planned, the amount of new information obtained with each additional interview had diminished to the point where the researchers

believed the “saturation” point had been achieved.

A total of 12 key informants were interviewed in January-February 2009. All interviews were conducted over the telephone, with most lasting approximately 20 minutes. All key informants gave consent for the interviews to be recorded.

Data analysis and reporting. The recorded interviews were transcribed verbatim for analysis. Key informant interviews were analyzed through an iterative process to identify key themes. Using these themes, transcripts were coded using NVivo v.8 software. Data from key informant interviews were supplemented with information from project documents, where relevant.

Where verbatim quotes were selected to illustrate important ideas in the report, key informants were contacted for permission to include the quote in reports, publications and presentations. Nearly all responded and granted permission.

Study limitations. Turnover of key personnel since 2004 hampered efforts to locate documents as well as knowledgeable key informants, representing a significant loss of institutional memory. Among those contacted, low response rates and limited participation by some networks indicate that results cannot be characterized as either complete or representative of all projects; there may be significant response bias skewed toward positive responses. Also, because of the time lag between the development of proposals, project implementation, and this study, recall bias (as well as lack of recall) may have affected key informant responses.

RESULTS

The results of the key informant interviews are presented thematically in three main sections:

1. **Projects:** Key informant perceptions concerning the impact of the RNNFI on the specific initiatives proposed by the networks;
2. **Networks:** Key informant perceptions on the development and functioning of networks, the impact of the funding on the network, and vice-versa;
3. **Key Informant Recommendations:** Recommendations and suggestions for future funding initiatives and hospital network initiatives and support.

1. PROJECTS

Definitions. The use of the term “project” within the research design referred to set of activities that the RNNFI was intended to finance. However, in no case did the RNNFI funds cover a “complete” network project through all stages of project management (initiation/analysis, planning & design, implementation, monitoring and evaluation, closing) ¹. In some cases, the hospital network initiatives were large and multi-phased; for example, one funded project covered the first year of the first phase of a 3-phase, 10-year project.

When discussing “the project,” key informants usually referred to the larger, complete network project. However, for clarity in this report, it was important to differentiate between the complete network project (*hereafter, “network initiative”*) and the project stage or component funded through the RNNFI (*hereafter, “funded project”*).

Relation of funded projects to network initiatives. RNNFI funds supported network initiatives at different stages in the project cycle. For the purpose of this study, it was useful to classify project stage as either **planning**

(planning and design stages, including needs assessments, feasibility studies, implementation plans, procurement, etc.) or **implementation**.

In the document review, there was sufficient information to classify 10 funded projects by the project stage within the network initiative, with four classified as planning, four as implementation, and two as both planning and implementation (including one pilot project). In two networks, RNNFI funds were used to bring specific expertise (i.e., consultants) to conduct needs assessments and feasibility analyses to plan for the network initiatives.

Because no network initiative was fully funded by the RNNFI grant, networks had to self-finance and/or obtain additional resources to complete their initiatives. Several informants indicated receiving additional funds from other agencies, such as FedNor or Canada Health Infoway. However, all of the network initiatives required significant amounts of self-financing as well.

For those networks funded at earlier stages of the project cycle, an indicator of success might be one that the initiative progressed to the next stage (e.g. from planning to implementation). All four networks had in fact progressed to the “next stage” in the planning process, and in fact all had essentially completed the larger network initiative; however, this was quite recent for some networks.

Some informants indicated that, although the RNNFI assisted advancing the network initiative, the costs of completing and sustaining the initiatives, and hence achieving of the goals behind the funding initiative, were covered by the network hospitals themselves. Most initiatives were delayed, some by several years, due to lack of funds (in part related to the cancellation of the RNNFI’s second year of funding). Although all would have experienced greater benefits from RNNFI if the funding

program had continued, overall the grants were seen as essential catalysts, enabling networks to launch projects earlier than otherwise would have been possible.

Types of projects. Most of the RNNFI funded projects were associated with initiatives focusing on improving aspects of health information technology (HIT) and connectivity across the northern hospital networks. Some networks proposed multiple projects, and the MOHLTC chose which one(s) to fund (some networks received funding for more than one project). A number of KIs noted that the province was promoting the development of IT in health services, and thus selected projects fit within these policy goals.

Given that “develop/improve network IT connectivity” was only one of the five Framework objectives, the researchers wanted to know why so many chose to use this funding opportunity to propose IT projects. Three explanations were offered. First, IT connectivity was seen as the precondition or essential infrastructure that enabled other networking processes. Second, most HIT projects not only improved network connectivity but simultaneously addressed most or all of the other objectives as well. For example, one project proposal indicated that the proposed Lab Information System “*Supports all 5 priorities as listed in the application guidelines.*” Finally, at the time of the call for proposals in late 2003, although there was an increasing policy interest in HIT, there were no other sources of funding available for HIT projects. HIT was too expensive and complex to be undertaken by individual hospitals, and by nature and necessity, HIT was a collaborative investment that matched the network-level activity targeted by RNNFI.

Two main rationales were provided for the projects proposed: improving providers’ access to information; and streamlining of processes and services. Both served the downstream objectives of improving patient quality of care

and services, sharing of resources and reducing duplication, and attracting and retaining physicians, particularly specialists.

“...that was the big driver, making sure that the physician population had the data and the information to be able to care for the patient.”

“And, our thinking was that that this would improve patient care, as it would allow physicians, particularly specialists... to move more easily back and forth between the hospitals [where] they provide service.”

The RNNFI Initiative did not provide funding for sustainability of the projects, for example, costs associated with training staff and physicians in the use of new technologies, or maintaining hardware and software. Network hospitals had to absorb these costs to sustain their initiatives.

Project impacts. The overall informant perceptions regarding the impact of the funding were quite positive. Informants indicated that they felt the investment provided a valuable contribution, whether “*seed money*” or substantial implementation funds, and the RNNFI’s \$10 million was money well spent.

In the proposals, networks were asked to identify how the project would advance the broad objectives of the 1997 Rural and Northern Health Care Framework. In this study, key informants were also asked to discuss the impact of the RNNFI in relation to how the funded projects supported these objectives.

As previously noted, key informants tended to describe the impacts of the complete network initiative, rather than the specific stage of the funded project, as the outcomes could not be attributed to only that portion funded by RNNFI. Although informants agreed that the RNNFI contributed to these outcomes, caution is warranted against attributing all credit to the RNNFI, or direct impact to RNNFI. There is

insufficient data to directly link the funded projects to the distant outcomes described. Given the number of additional funding sources and other external influences, RNNFI should be seen as a contributing factor to these outcomes.

i. Improve linkages to other community-based service providers, and

ii. form partnerships with other hospitals and community based-service providers in order to enhance access to health care services.

The majority of the network initiatives focused on improving within-network IT capacity and efficiencies. As such, the funded projects and initiatives (in the north) did not directly address linkages to service providers outside of the hospital networks. Enhancing linkages with community-based service providers was seen by informants as a later stage of network development, to come after the hospital networks were sufficiently developed (this later staging of community providers' involvement was consistent with the design of the Framework). However, most networks did involve other community partners (e.g. community care access centres (CCACs), provider groups) in meetings and project planning. Where networks remain active, a growing number of community-based partners are active members. If the RNNFI had continued after the first year, this objective would likely have been addressed as well.

The initiatives supported by RNNFI funding did result in enhanced patient access to hospital-based health care services. Increased service volumes and improved access to specialists were specifically cited as direct impacts of RNNFI investments and completion of the larger network initiatives. More specifically, improved turnaround times for diagnostic test results, decreases in wait-times for CT services, less patient travel, access to patient health information and increased hours of service provision were all mentioned as resulting directly from the implementation of the network initiatives. These improvements in services were

clearly cited as directly resulting in improved services to patients and communities.

iii. Develop/improve network IT connectivity.

The impact of the RNNFI was described by a number of key informants as providing a necessary catalyst to initiate network IT initiatives. The RNNFI likely resulted in many of the new systems being implemented years sooner and across many more of the network hospitals than could have been possible without the funding. Network IT initiatives further contributed to the development of regional IT infrastructure and expertise.

The benefits to smaller hospitals were mentioned repeatedly by the key informants, who emphasized the fact that many of the smaller hospitals could not have participated in the network initiative without the funding provided through RNNFI. In one network, larger hospitals with old-but-functional systems elected to wait for their upgrades until after the smaller hospitals with no connectivity were brought online. KIs from larger centres noted that, for the network initiatives to be successful, the involvement of smaller hospitals was essential, as the inability to bring smaller organization "online" was often the limiter in achieving true network connectivity. By allowing the networks the flexibility to target resources to those parts of the network that required it most, the entire network benefitted.

KIs frequently mentioned building on earlier IT initiatives, as well intentionally choosing to implement an IT initiative that would serve as the building block for future IT components. But while pre-existing structures could facilitate the implementation of new systems, old systems could also serve as a barrier to increasing network connectivity, as debates over IT platforms and interoperability could stall projects. Disagreements over the merits of tried-and-true systems with heavy prior investments, vs. newer state-of-the-art systems that "*push the envelope*" for those just coming

online, posed challenges and resulted in delays for some networks.

The rapidly changing IT environment also had an impact on network initiatives. In one case, the delay in implementation turned into a benefit, as a major change in the availability of the planned IT system resulted in switching to a different system. One KI observed that, without the delay, the new system would have been obsolete by the time it was implemented. In this case, the delay was seen as a benefit because it avoided an all-too-common problem in information technology.

iv. Improve recruitment and retention of physicians and health professionals.

Several of the informants indicated that the network initiatives also had a positive impact on physician and hospital staff satisfaction levels. Many of the network initiatives reportedly had a positive effect on physician recruitment, retention and continuing provision of service between locations. Regarding HIT, KIs expressed the view that the newer physicians “*expect it,*” and the availability of HIT in the northern hospitals made them more desirable as employers.

HIT also addressed physicians’ need for back up and relief services, as it created connections to distant sites (e.g. Toronto, Vancouver) for extended coverage. Another benefit was that HIT allowed physicians to “*get away,*” as they could remain in connected to their hospital system and provide essential care from a distance (e.g. on vacation).

Because specialists in the north often provide coverage to multiple hospitals within a network, information systems that facilitated working across multiple sites was particularly important to recruitment and retention. It also reduced the frequency that specialists needed to travel, an important consideration on northern roads, particularly in the winter.

Not all initiatives were IT-focused. For example, one addressed the issue of physician credentialing, which could be an arduous and costly process for a physician across multiple independent sites. A standardized credentialing process was developed by one network to reduce this disincentive to working in the north. One KI from a small hospital noted an additional benefit, in that the standardized network process greatly improved the rigor of the individual hospital’s own credentialing process.

v. Promote efficient use of health care resources within the network.

All the projects and initiatives were reported to improve the efficiency of resource use. HIT initiatives such as picture archiving and communication systems (PACs) for diagnostic imaging, for example, reduced the duplication of tests and reduced the need to physically transport films, which resulted in reduced waiting times for results and increased patient throughput.

Some network initiatives were specifically focused on the streamlining of processes (e.g., physician credentialing) and services (e.g., common laboratory systems), that KIs viewed as key to ensuring efficiencies by preventing duplication of activities and equipment. The streamlined physician credentialing was designed to enable physicians to move more easily between hospitals across a network, by reducing administrative duplications and improving network-wide credentialing standards. The common laboratory systems enabled efficiency gains by increasing the sharing of resources and reducing the need for each network member to individually supply supply all laboratory equipment.

2. NETWORKS

Network configuration and geography.

Networks were designed so that a single large hospital would serve as the hub of a network, yet this design resulted in different sets of issues in the North East and North West LHINs. In the North West, a single “large” hospital served as the referral centre and hub for all hospitals in the region (with the possible exception of one hospital near the Manitoba border, which has stronger ties to Winnipeg). In the North East LHIN, however, five networks had been established, with both secondary and tertiary level hospitals serving as hubs. However, those tertiary level hospitals additionally provided referral services to other networks, without being members of those networks.

As the HSRC pointed out, the role of the tertiary hospital for each of the networks in its region needed to be clarified. This study reinforced this point, as smaller hospitals had established mixed referral patterns and service arrangements with its assigned hub and the tertiary hospital outside of the network.

Moreover, small hospitals that lie midway between two hubs also had mixed patterns of referral and specialist services, depending partly on what services were available at which hospital. This could create some tension for a small hospital, which, depending on the objective of a given initiative, could perceive that its interests would be better served by an alliance outside of its assigned network, at least with regard to that particular service. It also created tension between two networks when one network was seen as interfering in its project and “poaching” member hospitals, with subsequent consequences to the project, and the network.

Geography also played a role in the continuation of hospital participation in a network. One hospital that was located between 2-3 hours away from other network hospitals drifted away

from their designated network. This was perceived as a legitimate reason for not participating in the network’s activities and establishing linkages elsewhere. The ability for network members to meet was viewed as a key ingredient for network sustainability. Another KI emphasized the importance of members committing and agreeing to meet on a regular basis, suggesting that if the network members do not meet, then projects and collaborations will not happen.

Participation. In all but one network initiative, key informants described planning and decision-making processes that were participatory and democratic. Where funded projects did not directly benefit some hospitals, they nonetheless agreed as to the use of the funds as decided by the network.

Despite some initial concerns over “*the elephant in the room*” (e.g. the possibility of the “big” hospital dominating group decision-making), all agreed that the big hospitals had provided leadership without dominating or silencing the smaller hospitals, that all network members had an equal voice and benefited from the project, and that the smaller hospitals in the network benefited the most. One network emphasized the importance of maintaining autonomy to the smaller hospitals, particularly in the context of “rationalizing” initiatives that could result in the elimination of jobs in a small community.

There was one exception to the generally effective collaboration and participation. One network initiative started out that way, until the project committee’s selection of an IT platform and vendor (the outcome of the funded project) conflicted with another network’s choice of IT vendor. Despite their participation in the initial selection, some network members were ultimately convinced that the initial choice was not the best for them and rejected the committee’s decision. This led to a divided network, with some hospitals joining the other network for related activities.

Trust vs. contracts. All of the informants placed great emphasis on trust among partners, even where trust had been lost. Among the two most “highly integrated” networks, trust among partners was seen as the key ingredient of their success. One informant went so far as to suggest that the absence of formalized agreements was the reason for success, and that contracts were the reasons that other networks had stumbled. However, at the time of the interview, this particular network had arrived at the point of needing a formalized arrangement and was in the process of incorporating as a hospital alliance with a legal contract.

However, the other two “less integrated” networks also reported high levels of trust. In one of these networks, formalized agreements were deemed unnecessary as a result of this trust. In hindsight, this was viewed as a mistake by one KI, as disagreements within the network resulted in some members backing away from initiative commitments and their network partners, ultimately damaging relationships. Thus, trust can be seen as a necessary-but-insufficient ingredient to the successful functioning of networks.

Despite the HSRC’s efforts to elaborate governance models for networks, it is noteworthy that only one informant recalled an agreement being in place at the time of the RNNFI (others in the same network did not), and that nine years later, another network is currently in the process of instituting a legal arrangement.

Impact of funding on network function. Of the four networks participating in interviews, two were already well-established and had undertaken successful collaborative projects prior to the RNNFI. To the extent that the projects funded under the RNNFI strengthened in the infrastructure underpinning the networks, the RNNFI arguably has contributed to the advancement of the network. However, among the other two networks, there is little evidence

that the projects contributed toward network integration. In one case, the project served to divide the network; in the other, the independence of network members appears to have been maintained.

It appears more likely that the outcome of the RNNFI was dependent on the strength of the network than the other way around. This is possibly due to a funding focus on “projects” instead of network organizational development. Both the 2000 HSRC report and the 2004 OHA/MOHTLC review recommended funding of network organizational development as distinct from the funding of projects. The 2003/04 funds did allow for both types of support, with at least one project (in a southern network) focusing on network development. However, without a distinct focus on, or funds for organizational development, networks were left to their own devices, with varying degrees of success.

Networks with ongoing activity had established a mechanism for funding network-related activities, through “dues” or membership fees that all partners contributed. One network had a paid network coordinator. However, these networks also had a larger number of members than the other two networks. These networks also continue to meet on a regular basis, either bi-monthly or quarterly. For the “less integrated” networks, there were mixed reports on whether the networks continued to exist, and although all agreed that members had not met in a long time. As was mentioned above, meeting on a regular basis was suggested as a key factor in successful network collaboration.

Collaboration as northern culture. Most of the KIs indicated a strong belief in the network concept, and framed it as part of northern culture. There was a general consensus that the northern hospitals functioned well within a network structure due to necessity, and that collaboration was “*a mode of survival*” in the north.

Networks were not viewed as “new” in the eyes of the key informants, but rather a normal way of doing business in the region. The huge geographical challenges and limited population necessitate that northern networks collaborate together to provide better service for less cost for more people. By providing policy and financial support to what they were already doing, the RNNFI was viewed as particularly beneficial to the north.

At the same time, successful project implementation was viewed, in part, as the result of this history of working together. Hospital networks that had successful collaborations prior to the RNNFI were more able to “*take this initiative and run with it*”.

3. KEY INFORMANT RECOMMENDATIONS

Key informants were also asked to make recommendations regarding future funding initiatives.

Key informant recommendations covered three categories:
(A) recommended projects or initiatives that merit funding,
(B) recommendations about networks, and
(C) recommended funding strategies.

The recommendations in this section strictly reflect the responses of the key informants. The researchers' conclusions can be found in the final section of the report.

The recommendations and conclusions in this report do not reflect official MOHLTC policy or program directions.

A. Recommended Projects/Initiatives

Further improvements in IT and connectivity. Most of the specific projects or initiatives mentioned by informants were related to e-health strategy projects on which their respective networks were currently working at various stages. Several informants mentioned that generally, any project that would advance the objectives of the ICT blueprint, ONe-Health Strategy, a common EMR/EHR, or the provincial e-health strategy, were appropriate projects for special funding initiatives. Specific projects and equipment needing funding included digital image repositories, telepharmacy, telepathology, telehealth units, and EMR workstations, as well as education and training for end users.

This was linked to the current lack of, and need for capital funding for hardware and software. For example, one informant noted that a new one-time funding could provide immediate support for activities planned under the provincial e-health strategy.

“So there's all kinds of things that ... from establishing appropriate connectivity between

agencies to new applications that could be delivered, e-referral systems as an example. . . And you know, providing contributions on a one time basis, I think is a good thing. The province essentially doesn't fund this directly to health service providers and it's a challenge.”

According to one informant, the lack of connectivity remained “*the biggest bottleneck*” for advancing e-health initiatives that required two-way information exchange. This informant recommended that funds to complete the “*roadway*” were the highest priority. This included not only ICT infrastructure, but ways to provide support for the infrastructure in remote areas.

Moving beyond hospitals. A couple of informants identified the need to expand the focus of network activities beyond the hospitals to start including community-based partners. This was one of the objectives of the Strategy, however, the early network efforts focused on the hospital networks, viewed as a first stage that would later enabling the inclusion of community-based partners.

One specific need identified was linking emergency physicians with FHTs/family practice physicians/community-based physicians, to enable ER docs to access a family physician's patient history.

“Another initiative that would support hospitals in a big way would be the linkage between our Emerg physicians and Family Health Teams, or family practitioners... If we had access to their data. Because they have a history on the patients that we don't, when they present into the Emerg. And if they had access to that individual's file in a physician's office it could save them a lot of guessing... from a drug regime to care plans... Because there would be big bang for the buck.”

Non-urgent patient transfers. Informants from two networks recommended funding to address the issue of transporting patients between hospitals, and each linked it to the Alternate Level of Care (ALC) situation.

"I think we've got to be working on our ambulance transfers, that's a big issue. And I know there's been a lot of dialogue on how we can do that . . . And I think that that ties in with our, our Alternate Level of Care patients too. It's the big issue that our main hospital is plugged up and can't accept people into it. You've got people in hallways and things like that. And there may be hospitals within the region that can take those patients. So those are two issues that are being discussed at the present time."

Shared services. Although mentioned by fewer informants, one-time funding was seen as particularly important for shared services projects, such as pharmacy services, laundry services, or central supplies. Unlike the "business case" for some ICT projects that resulted in cost savings to repay for start-up costs, one informant commented that shared services projects did not necessarily result in lower costs. However, they did result in improved quality. Because of the lack of a "business case" for shared services, where the quality outcome was desirable, one-time funding to cover the initial costs was important to overcome partners' reluctance to attempt shared services.

B. Recommendations about Networks

Continue and support the networks. Even where networks were less active, informants strongly supported "the network" as an organizing and coordinating body. The KIs felt that the network structure is effective and has a role to play in improving health care coordination and integration. Some indicated a need for continued funding and administrative support in order to continue the success of networks.

"And so it's a structure that works. It simply needs to be supported and ... it is in need of administrative support in terms of making it work."

Administrative and/or financial support for networks could also extend to special networking activities. Two key informants emphasized the value of strategic planning activities for networks. For example, one stated:

"[The network] has had a couple of ... retreats, where we've talked about mission and vision ... And I think that those are useful exercises."

Clarify the role of the networks. Several of the KIs were uncertain about the status of their networks given the significant changes in the province's health care landscape since the network strategy became policy (i.e., dissolving of the District Health Councils (DHCs), implementation of the LHINs), and desired guidance from the MOHLTC regarding their role in this new environment.

"I think that the network is at risk at this point, because we really have no clear indicator from, from any areas of authority."

"And, we have inquired from the Ministry, we have inquired from the LHIN, as to what they see the role of the networks to be. And that has not been communicated back to us. In that there really is no response, because in many parts of the province, the networks are doing nothing... They've, they've essentially ceased to exist... Whereas, ours continues to undertake initiatives..."

Acknowledge network successes and build on them. Some informants expressed a tremendous amount of pride in their network and its accomplishments, and wanted to share their successes with the MOHLTC and others:

“... come and see what we're doing with it, and use us as an example. Because I really do believe... there's not that level of joint venture and collaboration between institutions anywhere else in the province.”

Importantly, prior successful experiences were often cited as one reason for the success of the funded project and network initiative. Successful experiences reportedly helped to build trust among partners and develop the interorganizational structures for necessary for collaboration. And, perhaps most importantly, success provided network members with tangible ‘proof of concept’ of the benefits of the network and motivated them to continue network activities beyond the initial support.

C. Recommended Funding Strategies

Sustainability and ongoing funding. The issue of sustainability was raised most often in the context of one-time funding. When asked about the value and limitations of one-time funding, informants emphasized that *“it's better than no funding.”*

“I mean, I'm against one-time funding when I have something set up and it's going to cost me a lot of dollars each and every year that I don't have in my budget, then that doesn't help me.”

“Well obviously the best situation is ... funding provided for capital, i.e. on a one time, but also sustainability funding. That would, obviously, be ideal. But umm, one time funding is better than no funding! So yeah, I would recommend that they continue to do this.”

Without exception, informants were able to identify numerous benefits of the one-time funding initiative.

Still, many struggled to obtain funding to see the larger network initiatives through to the end.

One network initiative was delayed by three years while it sought additional funding, although it did succeed. All key informants recommended more funding, and continuity in funding initiatives for multi-year, multiphase projects. Particularly for projects funded at the planning stage, the lack of funds for implementation was perceived as a real threat to sustainability.

Sustainability and flexibility. The issue of sustainability was also discussed with regard to the importance of flexibility for eligible costs. For example, KIs perceived a contradiction between the province’s vision of electronic health records, which promote the implementation for electronic health records, but fail to provide capital funds for either hardware or software. Recommendations included funding for capital costs of ICT initiatives, like medical equipment:

“We're going to Electronic Health Records on the floor. Well guess what? I need work stations on the floor... Guess what? They're not eligible.”

Recommended ICT initiatives varied on whether the costs were largely associated with hardware or software needs, but KIs recommended that both should be eligible for funding. Informants named a couple of specific ICT equipment needs where funding could advance their networking objectives, such as telehealth units to increase access to specialists, or work stations for the EHR.

In addition, education for end-users to learn the new technology was seen as an important funding need. The lack of skills to use the technology could threaten the sustainability of ICT initiatives. For example an EHR initiative when doctors or nurses are not *“computer savvy”* could result in the technology not being used appropriately resulting in inefficiencies in care provision and ICT investment.

Many of the informants expressed appreciation for the flexibility of the RNNF initiative, which allowed the networks to identify their own projects to meet their own needs. One contrasted the RNNFI with “more typical” province-wide grant programs that targeted specific project types or outcomes. While these targets may benefit the majority, these targets were often irrelevant to a minority and left them unable to benefit from the program. In particular, projects that were seen to benefit the south very often had limited benefits to the north, and vice-versa.

“...What was very good about this, was we were allowed to decide what our priorities were. And, what projects, initiatives would best meet our needs and serve our patients.”

The messages “Don’t be prescriptive” and “One size does not fit all” succinctly capture this point.

Funding for planning and needs assessments.

Some informants commented that it was often easier to find funding for implementation than the planning stage, however those who received funds for projects at the planning stage emphasized that funding as particularly useful where local expertise was not available and outside expertise (e.g. consultants) needed to be brought in.

“...it would have been nice to be able to get to implementation...but you’ve got to have planning. And, and getting straight through to the proposal development was ideal, because then you can get onto the next stage...”

“...the [research] projects aren’t sustainable, but the investigations can lead to projects that may be sustainable. And, and because it’s investigation, then it allows us to basically open the window on some new opportunities. It still takes a lot of work to find the funding though.”

Funding level. Because the RNNFI funded projects at the hospital network level, we also asked about the appropriateness of funding at the network level and recommendations for the future. Although most informants qualified their statements in terms of the type of projects being discussed, most agreed that the network level (or higher) was the appropriate level to fund special projects. Funding at the network level would improve integration and reduce fragmentation. Depending on the type of project, some viewed the LHIN rather than the network as the more appropriate level.

“...the LHIN level is the natural grouping for [system planning] at this point. And it would certainly be welcoming to have a one-time infusion to be able to move...coordination of information a step further.”

“If it was at the LHIN level...you might eliminate the situations where people will be doing different things that might eventually have impact on the others.”

For some informants, the LHIN geography matched the network geography (NWLHIN); for others, the difference in scale between the network and LHIN in the NELHIN presented a dilemma for KIs in terms of identifying an appropriate level of funding.

“...the North East LHIN has divided itself up into seven planning areas. And the Timmins Cochrane area is one of those planning areas. However, the Temiskaming District is another planning area. So two of our partner hospitals, Kirkland and Englehart, are outside of the LHIN geographical planning area. So, there’s some incongruence there.”

Some pointed out that hospital-specific projects were sometimes necessary to get all hospitals to the same level for effective networking, and that each hospital may have its own particular issues when working toward a common goal.

Nevertheless, most argued that funding collaborative projects remained critical to the goals of integration, and that funding for network- or regional-level projects was often more difficult to obtain than for individual organizations.

CONCLUSIONS & RECOMMENDATIONS

Main outcomes. Based on available data, funds were used as planned. “Funded projects” were usually a part of a larger network initiative, and some described the RNNFI funds as “seed money” or a “catalyst.”

All informants reported benefits from their funded project that advanced the larger network initiative. These network initiatives in turn advanced four of the five goals of the Framework, which were to: develop/improve network IT connectivity; improve recruitment and retention of physicians and health professionals; form partnerships with other hospitals and community-based service providers in order to enhance access to health care services; and, promote efficient use of health care resources within the network. The only goal not addressed by the RNNFI (at least in the north), improving linkages to other community based providers, was a recommended “next step.”

Informants further identified specific ways that the completed network initiatives improved service access and patient care within the community. Some networks continue to work collaboratively, others do not; this was attributed to characteristics of the networks themselves, rather than the funded projects or the RNNFI *per se*. All identified specific benefits of the one-time funding approach, and indicated an unmet need for special projects funding.

Network benefits. All key informants agreed that the RNNFI was important and benefitted their network and communities. Small hospitals were seen as having benefitted the most from both the RNNFI and the network strategy, as they would not have been able to finance IT and connectivity projects on their own, nor would they have been able to maintain operations on their own. In a given network, the strategy of targeting resources to those with the greatest

needs proved beneficial for all network members.

Sustainability. Reported threats to sustainability of hospital networks included difficulty obtaining funding for the ongoing network initiatives and lack of administrative support to the networks. The RNNFI funded projects that focused primarily on infrastructure rather than network development, and did not build in sustainability. The goals of a funding initiative should take into consideration significant costs to grantees of sustaining the project (e.g., staff training and education, completion costs, technology purchasing and depreciation). These elements that support the goals of the initiative are worthy of funding as well.

Building on success. Future initiatives should build on existing relationships and successes. Some hospital networks are still functioning, especially in the north. The MOHLTC should view this as an important opportunity to build upon these strengths. There is a need for continuous collaboration and planning across jurisdictions (community, network, LHIN, MOHLTC, and OHA) to solicit recommendations, priorities for projects, and new policy directions. Continuing hospital network activities, providing administrative supports and collaboratively clarifying the role of hospital networks in the current Ontario health care landscape will help to capitalize on the successes to date.

Northern diversity. This report focuses mainly on the hospital networks of northern Ontario. As such, the findings may be difficult to generalize to all networks across the province. While the north often distinguishes itself from the south, it is also important to note that the north itself is not homogeneous. Each northern network had its unique needs and challenges. The geography of northern Ontario posed some

significant obstacles in the planning and completion of the network initiatives. For example, one of the northern networks needs to accommodate two time zones with two different sets of rules. Implementation of a common, connected information system in such a situation is exceptionally complex.

Need to strengthen evaluation. From the researchers' perspective, there were indeed many good reasons to examine the outcomes of a funding initiative from a longer-term perspective, particularly given that many of the funded projects are just now reaching the endstage and coming to fruition. Strengthening of monitoring and evaluation processes, particularly at the planning stage of a new program or initiative, would result in a stronger evidence base for future studies.

Flexibility is the key. Informants expressed appreciation for the flexibility of the design of the RNNFI program, indicating it as a key factor in their success. Future policies and programs affecting the northern hospitals need to acknowledge these significant differences by supporting initiatives which allow networks to self-define needs and respond to those needs with appropriate flexibility.

ENDNOTES

ⁱ There are a number of taxonomies of the project cycle or stages of project management. Another common taxonomy of the 5 stages is: initiation; planning or development; production or execution; monitoring and controlling; and closing.

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