Using Evidence to Meet Population Healthcare Needs: Successes and Challenges

INVITED ESSAY

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ABSTRACT

In order to respond effectively to the health needs of Canadians, healthcare planners must directly consider these needs when planning and delivering services. However, Canada's various healthcare systems have traditionally been organized based on historical levels of service provision as opposed to population health needs. A number of innovations in care delivery redesign in Canada have already been developed as part of efforts to foster a more effective and sustainable healthcare system. This paper presents two of these as case studies illustrating some of the main challenges in trying to identify and address healthcare needs, as well as some potential solutions to those challenges.

Healthcare planning in Canada – including health human resources (HHR) planning – has tended to be organized on the basis of historical levels of service provision as opposed to the health needs of populations (Birch and Chambers 1993; Cameron 2009; Tomblin Murphy et al. 2007). Most recently, there has been a growing awareness that to be effective and equitable, healthcare planning – including HHR planning – must be more systematically based on actual healthcare needs (Birch et al. 2007; Bloor and Maynard 2003; Duckett et al. 2012; Eyles and Birch 1993; Kephart and Asada 2009; Newbold et al. 1998; Tomblin Murphy et al. 2012c). In fact, a number of Canadian governments (Advisory Committee on Health Delivery and Human Resources 2004, 2007; Alberta Health and Wellness 2008; British Columbia Ministry of Health 2012; HealthForceOntario 2008; Manitoba Health 2006; Nova Scotia Department of Health 2005; Nunavut Health and Social Services 2005; Saskatchewan Ministry of Health 2011) and other healthcare stakeholders (Canadian Institute for Health Information, Health Canada, Statistics Canada 1999; Canadian Nurses Association/ Canadian Medical Association 2005; Health Action Lobby 2006; Pan American Health Organization 2005) have endorsed needs-based approaches to HHR planning. Despite this apparent support, however, much decision-making in Canada about healthcare resource allocation in general (Smith et al. 2013) and HHR specifically (Nova Scotia Health Research Foundation 2012) is done on the basis of historical and political factors as opposed to healthcare needs. Continuing to plan in this way will perpetuate existing inequities and inefficiencies in how healthcare is planned and delivered (Birch et al. 2007; Evans 2009; Lewis 1998). Improving equity and efficiency in healthcare planning and delivery will become even more imperative as growth in Canadian healthcare spending continues to outpace economic growth (Canadian Institute for Health Information 2012).

> *Continuing to plan on the basis of historical and political factors as opposed to healthcare needs will further result in inequities and inefficiencies in how healthcare is planned and delivered.*

Consistent with this imperative, governments across Canada have invested in a wide range of programs aimed at improving the effectiveness and efficiency of their respective healthcare systems. During recent meetings of the Federal/Provincial/Territorial Advisory Committee on Health Delivery and Human Resources, members spoke to the importance of needs-based planning for the health system and the workforce. They shared a number of innovative care delivery programs aimed at better meeting healthcare needs in their respective jurisdictions. In this article, we present the cases of the two of these programs, implemented on opposite sides of the country, whose effectiveness has been or is presently being evaluated. We will thereby identify some of the challenges that may be encountered in implementing such approaches, as well as some potential strategies for overcoming these difficulties. The first program – the Model of Care Initiative in Nova Scotia, or MOCINS – was implemented at the provincial level. The second – Care Delivery Model Redesign, or CDMR – was designed and implemented by the Vancouver Island Health Authority (VIHA).

The Model of Care Initiative in Nova Scotia

Background

MOCINS began in March 2008 as a partnership between the Department of Health and Wellness, district health authorities (DHAs) and the Izaak Walton Killam Health Centre (IWK). The impetus for MOCINS was to achieve health system sustainability in the face of the growing HHR challenge being experienced within the province, across Canada and internationally. The MOCINS mandate was to design, implement and evaluate a viable provincial model of care for acute care in-patient services that was patient centred, of high quality, safe and cost-effective (Province of Nova Scotia Health Transformation 2008).

Design

A conceptual framework for the model of care, referred to as the collaborative care model (CCM), was designed early in the initiative by a provincial inter-professional design team. The framework was used to guide local implementation of new care delivery models in acute care in-patient units, and more recently in other sectors such as maternal child programs. The model is designed to "align the care delivery system with the health needs of Nova Scotians and orient providers to work to their optimal scope of practice collaboratively within inter-professional teams" (Cruickshank and Snyder 2010).

Key principles of the CCM are the following:

- People – having the right people do the right work, collaboratively within inter-professional teams in which the roles of the healthcare providers are optimized to meet the needs of patients and their families
- Process – redesigning processes to eliminate waste, prevent duplication of effort by the healthcare team and enable patient and family self-care
- Information – ensuring timely access to information that supports care delivery, research and academic mandates
- Technology – utilizing modern technology to provide safe and timely care
- Engagement – ensuring effective change management and stakeholder engagement

Implementation

Guided by a Senior Advisory Committee, a Provincial Leadership Team made up of local DHA/IWK leads and provincial project leaders at the Department of Health and Wellness facilitated the phased implementation of this model, beginning with 14 showcase units (expansion is ongoing). This initial implementation (referred to as the "first wave") of the CCM included a variety of activities aimed at understanding patient care needs and aligning staffing and care processes accordingly. For example, a template for capturing patient health needs was developed, and provincially standardized role descriptions reflective of current education and legislation were developed to help guide staffing mix changes to meet those needs. Implementation of these changes varied depending on the unit and the patient population.

In all cases, the Provincial Implementation Team emphasized an inter-professional approach, and the role of allied healthcare providers was strengthened. In addition to the people changes described above, under the new model process changes were instituted to reduce inefficiencies and to provide greater access to information and equipment to support care delivery; in some cases, the use of modern technology increased (e.g., an automated medication delivery system and a new call bell system).

Evaluation

It was expected that a successful implementation of the CCM would result in a higher-quality experience for patients and better utilization of healthcare providers and other resources. It was also anticipated that the CCM would provide a healthcare environment that was safe and satisfactory for both patients and providers. To that end, an external evaluation of MOCINS was conducted to determine its impact, if any, on patients and families, providers and the system overall (Tomblin Murphy et al. 2010). It was hoped that, as a result of an improved care delivery model, acute care costs could be stabilized; however, cost reduction was not the motivation for MOCINS, nor was it part of the evaluation.

The evaluation was conducted using a modified outcome mapping (Earl et al. 2001) approach to measure impacts of MOCINS across the showcase units, and simulation modelling (Tomblin Murphy et al. 2009) to estimate the potential of MOCINS to affect provincial HHR shortages in the future. The evaluation incorporated the perspectives of all those directly impacted by MOCINS: patients and families, healthcare providers, unit staff and managers, district administrators or some combination of these.

The evaluation results, published in a recent paper in the *International Journal of Health Planning and Management* (Tomblin Murphy et al. 2012b), indicate that the first wave of MOCINS had a generally positive impact on patients and their families, healthcare providers and the health system. The evaluation data indicate that on units where staff were more involved in MOCINS professional development activities, staff-assessed working conditions – for example, in terms of team climate and role clarity – improved over time. In turn, there were better outcomes on units where care was more coordinated, the team climate was more positive and providers' various roles were clear. Such outcomes include shorter lengths of stay in the hospital and fewer repeat admissions for patients, as well as fewer shifts missed due to staff injury. At the same time, provider job satisfaction also improved.

Further, investments made through MOCINS in supporting team-delivered care models that involve the patient and family in care planning and use evidence to inform care planning and delivery were associated with fewer medical errors, fewer patient deaths per acuity-adjusted hospital cases, fewer Occupational Health and Safety incidents for providers and better health status reported by patients after discharge. MOCINS units maintained or improved the quality of the care they provided while using fewer resources, as measured by the number of resource intensity–weighted patient days of care they provided. Some of these effects mean potentially significant savings to Nova Scotia's healthcare system. In addition, incorporating these reduced resource requirements into simulation modelling showed that the improved efficiency of resource use associated with MOCINS means that fewer HHR are required to deliver the same amount of care, of the same quality or better, thereby reducing HHR shortages on these units. If the improvements achieved on MOCINS units were extended to all acute care units in the province, provincial HHR shortages could be substantially reduced, thus further improving the ability of the provincial healthcare system to respond to the health needs of its population.

In summary, findings of the MOCINS evaluation indicated that almost all outcomes for patients and families, providers and the system overall were maintained or improved during MOCINS implementation. Further, improved outcomes were associated with a greater involvement of unit staff in specific MOCINS activities, indicating that

MOCINS has been at least partially responsible for these improved outcomes (Tomblin Murphy et al. 2012b). Informed by the findings of this evaluation, the implementation of MOCINS has continued and expanded to other units and sectors in Nova Scotia (Province of Nova Scotia 2012).

Challenges

The front-line staff, managers and leads tasked with implementing MOCINS faced a number of challenges, the most significant of which were not related to MOCINS itself. These challenges were in existence for some time prior to the beginning of MOCINS and included issues such as shortages of staff, equipment and supplies; difficulty engaging physicians; and communication with other districts. Of the challenges related to MOCINS itself, the most significant appears to be related to communication about the initiative. A number of units reported feeling inadequately informed about MOCINS prior to – and, for some during – its implementation. Several units also reported that staff within and outside the showcase units have been blaming problems on MOCINS that have nothing to do with the project. Increased and improved communication about the project was identified as being critical to improving the awareness and understanding of MOCINS by staff, patients, unions and other stakeholders.

The main concern of the providers implementing MOCINS was that their commitment to making the initiative work should be demonstrated by DHA and provincial leadership in continuing to move the MOCINS forward. However, given the issues that the evaluation of MOCINS brought to light – including a number of units reporting insufficient resources to meet the needs of their patients – it appears that, while MOCINS is helping, it is not enough on its own to solve all the problems currently facing the healthcare system.

Care Delivery Model Redesign

Background

In 2006, similar to other Canadian healthcare organizations, VIHA was experiencing challenges related to HHR. Trends such as an aging workforce and scarcity of health professionals, coupled with an increasing demand for health services, were driving the need to redesign the way care was delivered. To address these challenges, VIHA developed the CDMR in 2007. In 2008, the BC Ministry of Health Services provided targeted funding to VIHA to support provincial research in the development of CDMR and to begin the spread of CDMR to the other health authorities (HAs) in British Columbia. Interior Health, Fraser Health, Northern Health, Providence Health, Vancouver Coastal and VIHA have all been involved (VIHA 2010a).

Design

The overall goal of CDMR is "care delivery that is able to respond to the care needs of patients, reflects inter-professional practice, and is built on data and evidence" (VIHA 2009: 2). Specific objectives within that goal include the following:

- Improved patient care quality and safety
- Optimized role, scope and function of all care team members
- Increased productivity
- Cost avoidance (e.g., overtime, injuries)

CDMR evolved quickly based on the findings from its first phase of implementation, which involved a comprehensive analysis of staff activities during work hours. This study was conducted using a proprietary data collection tool called Function Analysis; this tool quantifies the time spent and activities performed by each care provider with each patient. These data were collected by trained data gatherers who were equipped with a predefined data dictionary loaded onto a personal

digital assistant (PDA). Continuous observation was performed, with one data gatherer assigned to each staff person, 24 hours per day. Baseline data were collected on 930 staff on 15 medical/surgical units for a total of approximately 40,000 person-hours (VIHA 2010a, 2010b).

The findings of this investigation indicated that the issues affecting VIHA's health workforce were not simply related to the numbers of providers but, rather, extended to the way care was being delivered. In other words, even if every HHR shortage in the region could be solved, the care needs of patients would still not be adequately met. This was because care decisions were being informed by history, habit and tradition and not in response to actual changes in patient needs. It also became clear, through this investigation, that staff were not working to their respective scopes. A focus on patient needs and quality, safe, efficient care thus became the overall emphasis of CDMR. To date, the initiative has largely been focused on VIHA's three major hospitals and five smaller, regional hospitals, with additional expansion in its early stages.

Implementation

At the core of the CDMR activities are the concepts of elder-friendly care, inter-professional practice and care-related communication. To help integrate these concepts into its care delivery planning and practice, VIHA facilitated a provincial structured learning collaborative (SLC) from December 2009 to December 2010. Teams consisting of front-line staff from in-patient medical, surgical, rehabilitation and neurosciences teams participated in five learning sessions and completed tests of changes during "action periods"' between the learning sessions. Key goals of this process were to increase inter-professional practice, enhance elder-friendly care and provide staff with a systematic approach to testing and implementing changes to practice (Allen and Young 2011).

An evaluation of the SLC was conducted using quantitative and qualitative data from multiple sources (Allen and Young 2011). The evaluation found that staff had adopted and were making use of the systematic approach to testing and implementing practice changes, with each unit trying out half a dozen or more changes during the year of the SLC. These changes most commonly related to establishing or strengthening inter-professional practice or improving care planning and communication (e.g., through the use of whiteboards or team huddles). It was also found that teams of providers participating in the SLC improved in their compliance with CDMR principles (e.g., elder-friendly care) over its duration, although patient satisfaction surveys indicated that patients still desired to be more involved in their care. Measures of staff satisfaction were maintained or improved throughout the SLC.

A second VIHA-specific learning collaborative was launched in November 2011 in partnership with leaders of the VIHA Care Continuum Transformation Initiative, another strategic initiative within VIHA aimed largely at improving the transitions between acute care and community or long-term care experienced by older adults aged 75 years or more. Central to this learning collaborative were the education and support of staff about the importance of assessing six key attributes of patients' functional ability – cognition, medication, pain, bowel/bladder, nutrition/hydration and mobility – and documenting the pre-hospital status of each within 48 hours of admission as a means of getting to know the real person behind the patient that is presenting in hospital. An internal review of evidence concluded that addressing these areas is critical to preventing functional decline and facilitating timely discharge in the senior population. Ensuring such processes are

in place is thus anticipated to have a positive impact on lengths of stay, to improve patient satisfaction and to optimize discharge disposition. This round of the learning collaborative has been reported as going well, with the managers and the leaders indicating the importance of moving forward with the next phase of CDMR.

In addition to improvements in front-line delivery of care, CDMR leaders are also creating a new staffing model based on the care needs of the patients as the starting point of all decisions, and the identification of skills, attributes and processes needed to ensure those needs are met. The model is guided by three questions:

1. What are the care needs of the patients?
2. What are skills, knowledge and aptitudes required to meet those needs?
3. Of those with the skills, who is the most appropriate provider to meet the care needs?

Patient demographics and administrative data are used to describe each unit's typical patient population. Most of these populations are elderly, often with multiple co-morbidities and other social and cognitive factors requiring complex interventions and a high level of assistance with day-to-day functional activities. Functional analysis data and various staff roles/scopes/functions were studied to describe the work of the different care providers. This information was then combined with clinical expertise from managers and practice consultants and evidence from the literature about what "good care" should be in order to guide the development of a staffing model that is more aligned with the care needs of typical in-patient populations, while supporting staff to work to their full scopes of practice. This new model aims to promote the optimal utilization of staff resources in response to patient needs and to decrease inefficiencies (VIHA 2010a).

Evaluation

CDMR is one of a series of strategic initiatives being implemented in VIHA to promote sustainability and improve patient care, working conditions for staff and system efficiency. Other initiatives focus, for example, on improving infection control and reducing infection rates, on promoting safe work environments for staff and on facilitating the return of hospitalized seniors home as soon as possible (VIHA 2010c). A broad evaluation of the system-wide integration of these initiatives is currently being conducted to determine their impacts, if any, on outcomes for patients and families, providers and the system overall, and to identify the factors that supported or hindered these initiatives in bringing about the desired improvements in care outcomes.

Challenges

One of the most significant challenges reported by staff implementing CDMR was competing priorities for staff – to change their practice in general but also to participate in CDMR workshops designed to help them learn how to do so. Pre-existing staff shortages were identified as exacerbating this challenge. Particular concern was noted about competing priorities for managers, preventing them from devoting sufficient time to the initiative. Physician engagement was cited as another challenge to CDMR, though it is not directly related to the initiative itself. While several physicians have provided considerable leadership and support to the initiative, others have had very little involvement.

Communication about CDMR was cited as being critical to its uptake, and therefore its success, across units. There were concerns among some front-line staff about the under-

lying motivation for CDMR – for example, that it is merely an excuse to reduce registered nurse positions or otherwise cut the budget, as opposed to being about providing better care. More practically, while the initiative was designed to be "customizable" to the different contexts and needs across units, some staff expressed a desire for more concrete guidance on "what CDMR means."

Barriers and Enablers

There were a number of challenges common to both these initiatives. Chief among these was the limited resources with which to make the desired change to the way healthcare services were planned and delivered. Pre-existing staff shortages and competing priorities for participants, particularly those coming from the front lines, hindered the implementation of both initiatives. For significant organizational change to be achieved, it is imperative that dedicated change management supports be provided to those leading the change.

Resistance to change continues to be a challenge in both initiatives. There is considerable concern, particularly among front-line staff, about moving from what VIHA terms the "old right way" to the "new right way." Further, there is suspicion that any change directives coming from organizational leaders are motivated chiefly by fiscal restraint – that "this is just an excuse to cut the budget." Critical to overcoming this challenge is the foundation of these initiatives in a desire to better understand and respond to the healthcare needs of patients and, just as importantly, the clear communication of this foundation to all those involved. In both initiatives, the explicit use of measures of patient or population healthcare needs in driving staffing decisions and other planning allowed for more direct responses to these needs – through the management of both human and non-human resources – at the unit level. Similar use of information on patient and population healthcare needs at the system level would allow for better alignment of HHR and other resource management with those needs.

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Just as critical to success is regular, consistent and effective communication about the initiatives. This would allow key stakeholders (patients, families and other community representatives; front-line staff, managers and administrators; unions and professional associations) to have a clear understanding of what the initiatives are and are not, why they are being implemented and how they are being evaluated.

Rigorous, ongoing monitoring and evaluation of these initiatives has helped them evolve and adapt to the challenges faced during implementation. Evaluation must be considered as part of the process of planning such initiatives from their inception. Monitoring and evaluation require dedicated resources themselves; but without them, there is no way to determine the effectiveness of care planning and delivery and, thus, no way to plan in an informed manner. Monitoring and evaluation findings can also be of value in engaging stakeholders who are concerned about the changes that are under way.

Essential to effective monitoring and evaluation, and thus critical to informed planning, is the systematic collection of data measuring the inputs, outputs and outcomes of health-

care delivery processes across the continuum of care. Despite substantial investment in information systems and data collection by many jurisdictions, data sources remain fragmented and critical gaps still exist. Without additional and continued investment in the data collection and analysis infrastructure necessary to facilitate evaluation and inform planning, decisions about healthcare will continue to be made on the basis of politics and tradition as opposed to evidence.

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Critical to the success of both MOCINS and CDMR has been effective engagement of key stakeholders, particularly front-line staff, upon whom care delivery is ultimately dependent. In both cases, front-line staff have held a prominent place in the development and implementation of redesigned models of care delivery; however, they have also indicated that improvements to their engagement are needed.

Conclusion

Comprehensive needs-based healthcare planning is required to improve the performance of Canada's healthcare system. This type of planning requires will, leadership and commitment at all levels – from the front lines of care delivery to the highest levels of organizations and government – to overcome the various challenges associated with fundamental organizational change. It also requires the investment of dedicated resources to achieve and sustain change. Further, it requires investment in producing the evidence necessary to inform that planning, evidence about the process of implementing change and the outcomes associated with it.

There is confirmation that needs-based planning can be and is being done in Canada, to the benefit of patients, providers and the healthcare system overall. However, many changes to healthcare policy and planning approaches in Canada are not evaluated (Smith et al. 2013). This makes it difficult for the policy and decision-makers responsible for these approaches to know how effective they have been or how they could be improved. Moreover, without evaluation, it is hard for planners in other jurisdictions to benefit from any lessons that could have been learned from these programs.

Healthcare policy and decision-makers may be reluctant to invest in evaluations of their programs for any number of reasons. They may find it difficult to justify the additional expenditure during times of fiscal restraint, or they may be wary of the risk of finding that a program they had publicly touted did not live up to expectations. Also, conducting a scientific evaluation may not be within the capacity of some institutions.

It is our view, however, that these reasons are largely invalid. Traditional methods of healthcare planning in Canada have produced a system whose costs are becoming unsustainable (Canadian Institute for Health Information 2012; Skinner and Rovere 2011). Meanwhile, the chorus of calls for more efficient planning and delivery of healthcare in Canada are growing (Birch and Chambers 1993; Bloor and Maynard 2003; Canadian Federation of Nurses Unions 2011; Canadian Medical Association 2010; Eyles and Birch 1993; McGinley 2012; Muzyka et al. 2012; Newbold et al. 1998). The "old right way" of doing things is becoming increasingly impractical.

As for evaluation, it seems only prudent to invest perhaps 5% of a program's cost to find out exactly what was purchased with the other 95%. Even in the event that an evaluation finds a program to have been ineffective, the

same evaluation will identify ways of improving it. Further, an organization that lacks the capacity to adequately assess its own programs is incapable of improving.

A renewed focus on actual healthcare needs, combined with a commitment to systematic evaluations of healthcare policies and programs, would not only greatly enrich the evidence base available to guide healthcare planning, it would be a major contribution to improved healthcare in Canada. Most Canadian healthcare databases were originally developed for much different purposes than measuring healthcare needs, such as paying healthcare providers and monitoring healthcare system use (Wolfson 1994). While national surveys of population health, such as the Canadian Community Health Survey (Statistics Canada 2012a) and the National Population Health Survey (Statistics Canada 2012b), gather data on several dimensions of individuals' health status, most of the data currently collected on Canadians' health are still focused on monitoring healthcare utilization (Bryant 2009: 3) as opposed to identifying and responding to healthcare needs. This may explain, in part, the tendency to plan healthcare based on historical utilization. Although the measurement of population healthcare needs remains an inexact science, the availability of data and tools for measuring them have grown considerably in both quantity and comprehensiveness in the past few decades. As these measures and tools are used more widely, further improvements in them may be expected.

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In addition to the two case studies discussed in this paper, the wide range of other Canadian healthcare initiative evaluations published in the past few years alone (e.g., Barrett et al. 2007; Glazier et al. 2012; Gooch et al. 2009; Jeffrey et al. 2010; Manns et al. 2012) demonstrate that such evaluations are possible within the complex contexts of Canadian healthcare organizations. They also provide valuable insights not only for the planners and policy makers responsible for them, but for their colleagues in other jurisdictions who may be facing similar challenges. Only by investing in such ongoing evaluation can we maximize the return on the investments made in such programs and identify the programs that will best meet the healthcare needs of populations.

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