Managing changes in First Nations’ health care needs: Is telehealth the answer?

Josée Gabrielle Lavoie
Associate Professor, Community Health Programs,
University of Northern British Columbia
<jlavoie0@unbc.ca>

Donna Williams
Keewaytinook Okimakanak Telemedicine
<donnawilliams@knet.ca>
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The health care needs of First Nations living on-reserve have changed dramatically over the last decades. In the late 1960s, disparities in the infant mortality rate were dramatic, at 46 per 1000 live births for First Nations compared to 21 for all Canadians (Young, 1994, for the time period of 1965 to 1970). Immunization rates were poor and mortality from infectious diseases common. The 2000 Statistical Profile on the Health of First Nations in Canada reported an aging trend among First Nations living on-reserve, where growth is seen mostly among the 15-64 years of age (Health Canada (FNIHB), 2001). Chronic diseases now account for most hospital admissions (Health Canada (FNIHB), 2001). Non-insulin dependent diabetes mellitus in the First Nations population is on the rise; at three to five time that of non-First Nations. By the time First Nations reach the age of 30, 5 percent have developed the disease (Adelson, 2005). This data suggests that an increasing number of First Nations will be living their life with complex morbidity, requiring access to specialised care and secondary/tertiary prevention.

Current demographic and health need trends are widely recognized (Adelson, 2005; Bobet, 1998; First Nation and Inuit Regional Health Survey National Committee, 2005; 2001; Johnson et al., 2002; Martens et al., 2002; 2005; Young, 1994). Constraints associated with access to provincial services have been identified, and include issues of isolation, scarcity of specialists, challenges associated with cross-cultural communications, etc. Less attention has been paid to the current on-reserve services’ ability to meet these changing needs. Further, while telehealth1 is increasingly seen as a solution to address access issues (British Columbia First Nations, 2005; First Nations and Inuit Health Branch of Health Canada e-Health Solutions Unit, 2004; Hendry, 2005), demonstrating value to funders has been challenging.

This paper argues that on-reserve health care services are facing increasing challenges in attempting to meet First Nations’ needs. This is partially due to disinvestments by the federal government (Lavoie et al., 2005), and partially due to a lack of alignment between funded programs and changing needs. If left unaddressed, this will result in increases in avoidable hospitalization and associated provincial health expenditures. We argue that telehealth can assist in addressing these concerns, to some extent. Realizing telehealth’s full potential in achieving health gains is constrained by a lack of First Nations-specific telehealth indicators that can demonstrate value. This paper shows how the Keewaytinook Okimakanak Telemedicine program is helping to close this information gap, through the creation of a First Nations-specific Balanced Scorecard. This is an important step forward. Still, investments in telehealth

1 Telehealth and telemedicine are used interchangeably in this paper to include store-and-forward solutions; video-conferencing with or without the use of peripherals (dermatoscope, document cameras, etc.); and internet-based solutions.
should not detract from broader policy issues related to the financing of on-reserve health services.

Understanding the issues

Broadly speaking, barriers to recognizing current needs exist at two levels. A first is related to the design of the on-reserve First Nations health care system as funded by the First Nations and Inuit Health Branch of Health Canada (FNIHB). A second relates to federal-provincial jurisdictional issues. Both will be examined in turn.

A. The on-reserve First Nations health care system

The foundation of the current on-reserve health system goes back to the turn of the century. The federal government began to offer on-reserve health services in the 1920s following pressures from the settlers associated with the spread of tuberculosis (Waldram et al., 2006). These services were initially provided by nurses assisted by translators. Following a 1969 study, services were expanded to include Community Health Representatives (CHRs) and addictions workers (Booz•Allen & Hamilton Canada Ltd, 1969). The focus was on providing a limited complement of community-based services to alleviate the impact of illness, as was the current practice at the time. Public health interventions were largely limited to immunization. Prevention focused on prenatal and perinatal care. These services were prioritized and deployed to match the health needs and priorities of the time.

Following the 1966 Supreme Court of Saskatchewan decision, the federal government has taken the policy position that these services emerged for humanitarian reasons, and not as a result of Treaty obligations (Backwell, 1981). Further, the federal government has shaped its responsibility in matters of First Nations health care to simply complement provincial health services geographically accessible to First Nations. As a result, the type of services currently accessible on-reserve depends on the size and level of isolation of the community, relative to provincial services. As shown in Table 1, the majority of First Nations communities are served by Health Offices, Health Stations or Health Centres. Each designation reflects the type of services offered or funded by the First Nations and Inuit Health Branch of Health Canada (FNIHB). The mandate of these services is public health and primary prevention. In contrast, Nursing Stations are staffed by nurses with an expanded scope of practice. This allows them to provide a spectrum of secondary and tertiary prevention interventions not available in other communities. Collectively, the population served by nursing stations represents less than 11 percent of the Canadian on-reserve population.

2 Broadly speaking, primary prevention focuses on education to promote healthy life choices. Secondary prevention involves education and monitoring once a chronic disease has been diagnosed. The goal of secondary prevention is to prevent or delay the development of complications. Tertiary prevention focuses on managing and minimizing the health impact of complications once they occur.
Table 1, Types of services available in First Nations and Inuit communities, based on community type (Health Canada (FNIHB), 2004)

<table>
<thead>
<tr>
<th>Type of Facility</th>
<th>Type of services</th>
<th>Scope of services</th>
<th>Resident nursing staff</th>
<th>Total population served, 2002 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Office</td>
<td>Prevention services</td>
<td>Less than 5 days a week</td>
<td>Generally no</td>
<td>5,537 (5.6%)</td>
</tr>
<tr>
<td>Health Station</td>
<td>Screening and prevention</td>
<td>Less than 5 days a week</td>
<td>Generally no</td>
<td>5,016 (5.0%)</td>
</tr>
<tr>
<td>Health Centre</td>
<td>Emergency, screening and prevention</td>
<td>5 days a week</td>
<td>Yes</td>
<td>78,540 (78.8%)</td>
</tr>
<tr>
<td>Nursing Station</td>
<td>Treatment, nursing care, emergency care and prevention</td>
<td>24/7 services</td>
<td>Yes</td>
<td>10,573 (10.6%)</td>
</tr>
</tbody>
</table>

Since the mid 1990s, FNIHB has introduced a number of new on-reserve programs. As shown in Table 2, these programs largely focus on primary prevention. A notable exception is the First Nations and Inuit Home and Community Care program. This program’s ability to meet the needs of people living with chronic diseases is however constrained by provincial regulations that define the nursing scope of practice (Health Canada (FNIHB), 2003).

Table 2, New programs (Health Canada, 2003)

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Creation Date</th>
<th>Focus in Health Stations, Health Offices and Health Centres</th>
<th>Focus in Nursing Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicable Disease Control</td>
<td>1979</td>
<td>PP, SP</td>
<td>PP, SP</td>
</tr>
<tr>
<td>Tuberculosis Elimination Strategy</td>
<td>1992</td>
<td>PP, SP</td>
<td>PP, SP</td>
</tr>
<tr>
<td>Brighter Futures</td>
<td>1993</td>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>Canada Prenatal Nutrition Program</td>
<td>1994</td>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>FASD (old FASD/FAE)</td>
<td>1994</td>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>Building Healthy Communities (community mental health)</td>
<td>1994</td>
<td>PP, SP</td>
<td>PP, SP</td>
</tr>
<tr>
<td>Solvent Abuse Program</td>
<td>1994</td>
<td>PP, SP</td>
<td>PP, SP</td>
</tr>
<tr>
<td>Tobacco Control</td>
<td>1997</td>
<td>PP</td>
<td>PP</td>
</tr>
<tr>
<td>HIV-AIDS Strategy</td>
<td>1997</td>
<td>PP</td>
<td>PP, SP, TP</td>
</tr>
<tr>
<td>Dental/Oral Health Strategy</td>
<td>1997</td>
<td>PP</td>
<td>PP</td>
</tr>
<tr>
<td>FN/I Health information System</td>
<td>1997</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Aboriginal Head Start on Reserve</td>
<td>1998</td>
<td>PP</td>
<td>PP</td>
</tr>
<tr>
<td>FN/I Home and Community Care</td>
<td>1999</td>
<td>PP, SP and TP depending on scope of practice</td>
<td>PP, SP, TP</td>
</tr>
<tr>
<td>Aboriginal Diabetes Initiative</td>
<td>2000</td>
<td>PP</td>
<td>PP, SP, TP</td>
</tr>
</tbody>
</table>
B. Impact The international health care literature has long recognized that underinvestment in community-based health services leads to an increase in emergency care and avoidable hospitalizations (Macinko et al., 2003; Starfield et al., 2005). As shown in the diagram below, on-reserve health services represent only a portion of health care services accessed by First Nations to meet their needs. Priority setting in one segment of the First Nations health care system will have repercussions on overall patterns of service utilization. This is precisely what has been documented in the First Nations environment, resulting in increased avoidable hospitalization and increased costs for provincial health care budgets.

i. Avoidable hospitalizations Ambulatory Care Sensitive Conditions are health conditions that are responsive to interventions available through community-based health services. The Manitoba Centre for Health Policy lists 12 such conditions, including Asthma, Angina, Pelvic inflammatory disease, Gastroenteritis, Congestive heart failure, Severe ENT infections, Epilepsy, Bacterial pneumonia, Pulmonary/other tuberculosis, Iron deficiency anemia, Dental conditions, Cellulitis (Manitoba Centre for Health Policy, 2003). For these conditions, adequate access to health care services at the community level generally reduces the need for hospitalization and/or emergency care. Conversely, access to limited community-based services generally leads to a rise in avoidable hospitalizations. Shah et al. (2003) documented that on-reserve residents in northern Ontario have a much higher rate of hospitalization for Ambulatory Care Sensitive Conditions (ACSC) and a lower rate for Referral Care-Sensitive (RCS) procedures (renal transplantation and invasive cardiac procedures, for examples) than other residents of Ontario. Likewise, in Manitoba, Martens et al. (2005) documented that the rate of first referral to specialist for First Nations were only 7 percent higher than those of other Manitobans, this despite a much higher disease burden. The overall rate of specialist consult was 70 percent that of all other Manitobans. Martens et al. (2002) also documented that the rate of hospitalization for Manitoba registered First Nations was double that of all other Manitobans (348/1000 compared to 156/1000). The same study documented that the rate of lower limb amputations in the Manitoba First Nations population was 16 times that of other Manitobans. These studies concluded that barriers to access an appropriate complement of community-based health services, including secondary and tertiary prevention, played a major role.
ii. Impact on provincial health care systems A study by Lavoie and Forget (2006) estimated that the total health expenditures for Manitoba First Nations for the sample year 2004 to be $479 million for those living on-reserve, and $211 million for those living off-reserve. Maintaining the current level of services, given current trends in health status and utilization, the same study estimated a 57% increase in health expenditures for First Nations living on-reserve, and in a 49% increase for those living off-reserve by 2029. Overall, First Nations health expenditures will take on a larger proportion of the overall Manitoba public sector health expenditures, from 18.6 percent in 2004 to 23.6 percent in 2029.

Further, a study by Martens et al. (2002) showed that the per-person costs for hospital care was 70% higher for Manitoba First Nations people than that for other Manitobans. If the number of days spent in hospital by registered First Nations people could be reduced to the number of hospital days required by the rest of the population, Manitoba Health could have saved $989 per FN person, or $113 million dollars in 2004. By 2029, the potential savings in 2004 dollars would increase to more than $190 million per year. Over 25 years, this excess cost to the provincial health care system imposed by poorer health and poorer access for First Nations people was estimated to be almost $3.8 billion dollars.

A similar scenario emerged from an analysis of health expenditures related to diabetes mellitus and its complications (DMC). In 1995, the cost of DMC to the Manitoba health care system was estimated at $193 million per year, or 18% of the total health care budget. These costs were estimated to increase by 130% for all Manitobans and by 330% for Registered First Nations people by 2025 (Hallett et al., 2000; Jacobs et al., 2000). Complications due to diabetes are significant and debilitating. They include kidney failure, cardiovascular disease,
blindness, lower limb amputation, increased susceptibility to infection, and increased risk of tuberculosis reactivation. The rate of amputations related to DMC is 16 times higher (3.1 vs. 0.19 per thousand for ages 20 through 79) for Registered FN people in Manitoba relative to non FN (Martens et al., 2002).

This analysis shows that the needs of First Nations living with complex morbidities are not being met. Unless this changing environment is managed, the cost of providing care to First Nations will continue to soar, because the population is aging, lives with complex morbidities, and experiences barriers to access responsive community-based health services. Current FNIHB policies promote a greater reliance on secondary and tertiary care (hospitals). The human cost is considerable (Lavoie, 2008).

Managing change: Is telehealth the answer?

According to a report from FNIHB (2000), telehealth is seen as having the potential to: (a) improve access of patients and health care providers to varied applications and services; (b) provide support to patients, health care providers and communities; (c) facilitate linkages among individuals and groups, places and knowledge; and (d) contribute to effective administration/management of health-related program and resources. Others suggest that telehealth can also reduce direct costs to the health care sector and patients, and reduce indirect costs related to absenteeism (Ohinmaa et al., 1999).

The telehealth field remains under-researched (Jennett et al., 2003; Hersh et al., 2001; Roine et al., 2001), especially in the First Nations context. A recent literature search of references on Canadian First Nations and Inuit telehealth/telemedicine yielded only four references (Jennett et al., 2003; Jong, 2004; Jong & Kraisi, 2004; Muttitt et al., 2004). While helpful, these studies focused on cost-effectiveness to assign value to telehealth. To date, significant work documenting the overall value of telehealth has come from First Nations and Inuit organizations themselves. Demonstrating values has however been challenging for two reasons. First, overall impact on health status can only be demonstrated through accessing off-reserve service provincial utilization data (general practitioners, specialists and hospitalization data). While it is reasonable to assume that improved access to services at the community level will reduce off-reserve service utilization, the impact may only become visible in years, because of small numbers. Further, access to off-reserve service utilization data remains an issue for many First Nations organizations, preventing such an analysis to take place.

Second, there is a lack of First Nation-specific indicators. Recent efforts have been made to develop national indicators for telehealth/telemedicine. The National Telehealth Outcomes Indicators Project (Scott et al., 2007) and the Telehealth Supplementary Criteria developed by the Canadian Council on Health Services Accreditation (Canadian Council on Health Services Accreditation, 2006) reflect service delivery issues as they exist in urban and many Canadian communities. There are however important gaps, in that these indicators are quite limited in terms of ‘capturing’ the broad range of health and social services that can best produce health gains in First Nations communities.
Keewaytinook Okimakanak Telemedicine (KOTM) is one organization which is working on closing this important information gap. KOTM is the largest First Nations-controlled telemedicine network in Canada. KOTM began to provide telemedicine services in 2000. It serves 29 First Nations communities located across northwestern Ontario. KOTM uses telemedicine workstations equipped with patient cameras, stethoscopes and otoscopes to deliver a variety of telemedicine services that supplement and complement community-based health services. Its main goals are to improve First Nations access to health professionals, enhance the level and quality of services and to reduce professional and social isolation for community-based health workers and other community members.

In April 2007, KOTM embarked on the development of a Balanced Scorecard (BSc). BScs seek to translate the strategic objectives of an organization, in this case KOTM, into a coherent set of performance measures while minimizing information collection and analysis overload (Institute for Clinical Evaluative Sciences, 2004). The creation of a First Nations-specific BSc was part of an overall change management process funded by the Canada Health Infoway. The KO BSc was intended to serve as a communication tool for four broad categories of stakeholders: First Nations communities, government-funders, clinicians and partner organizations. Guiding the process were the following principles:

a. The KO Balanced Scorecard is a KO-led and KO-driven initiative;
b. The priorities, values and beliefs of communities are reflected in the KO BSc, and speak to individual, family and community interests in quality of care and access;
c. The KO BSc is a meeting place where stakeholders can recognize their own priorities, and understand the priorities of other partners;
d. The KO BSc is designed to educate stakeholders and to generate information that supports KO’s sustainability strategies;
e. The KO BSc is a practical tool;
f. The indicators chosen are designed to reflect a best practice model, to be shared with other First Nations: as a result, some indicators are numerical while others are narrative;
g. Whenever possible, the selected indicators rely on data reporting mechanisms already in existence;
h. Where this was not possible, workload and sustainability were considered;
i. The selected indicators are useful from a community service provision point of view; and
j. Selected indicators are useful from the funders’ point of view.

For the purpose of developing KO’s BSc, possible indicators were derived from a variety of sources, including:

- The indicators identified by Dr. Ricardo Ramirez, Tina Kakepetum-Schultz and Nancy Muller in discussions with community members and providers (Ramirez et al., 2007);
The Keewaytinook Okimakanak Telemedicine Evaluation report (CRaNHR, 2006);
The financial indicators identified by CRaNHR, based on the collated work of various stakeholders (Hogenbirk & Pong, 2007);
The First Nations and Inuit Health Branch of Health Canada (First Nations and Inuit Health, 2007);
The Ontario Telehealth Network (Ontario Telemedicine Network, 2007a; 2007b); and
The grey and published literature on telehealth/telemedicine (N=57 references, see Lavoie & Mitchell, 2007 for details).

A total of 56 possible indicators was produced through this exercise. This was then reviewed by KO staff and stakeholders. Indicator selection was based on four broad factors including: relevance to KO, relevance to stakeholders, availability of data and workload. The final count was 14 indicators, organized along their relevance to specific stakeholders, as shown below.

The KOTM BSc brings together both narrative indicators (3) and numerical indicators (11).
<table>
<thead>
<tr>
<th>STAKEHOLDERS</th>
<th>FOCUS</th>
<th>INDICATORS</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community utilisation</td>
<td>First Nation Leadership</td>
<td>1. Number of First Nation advisory committee meetings</td>
<td>Numerical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Number of community engagement visits/community</td>
<td>Numerical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Number of family visits sessions</td>
<td>Numerical</td>
</tr>
<tr>
<td></td>
<td>Community utilisation</td>
<td>4. Number of consults cancelled as a result of clinical failures</td>
<td>Numerical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Percentage of growth rate in telemedicine activities/community</td>
<td>Numerical</td>
</tr>
<tr>
<td></td>
<td>First Nation broadband technology</td>
<td>6. Percentage of technically successful consults/sessions (not cancelled due to technical problems)</td>
<td>Numerical</td>
</tr>
<tr>
<td>Government</td>
<td>Innovation</td>
<td>7. Telemedicine consults used in an innovative way by KO communities and staff</td>
<td>Narrative</td>
</tr>
<tr>
<td>Cost avoidance</td>
<td>8. Avoided travel cost (participants, federal government, provincial government, including escorts) by type of session, by payees</td>
<td>Numerical</td>
<td></td>
</tr>
<tr>
<td>Policy</td>
<td>9. KO’s contribution to policy development</td>
<td>Narrative</td>
<td></td>
</tr>
<tr>
<td>Clinicians</td>
<td>Access</td>
<td>10. Percentage of clinicians willing to continue offering services via telemedicine after their first experience</td>
<td>Numerical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Percentage of potential consults for which no provider could be recruited to meet new needs or special/low recurring needs</td>
<td>Numerical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. New telemedicine-enabled clinical service areas introduced</td>
<td>Narrative</td>
</tr>
<tr>
<td>Partnerships</td>
<td>Capacity building and integration</td>
<td>13. Number of educational sessions per month with breakdown showing % from accredited events: % that are based on formal partnership and the # of new partnership</td>
<td>Numerical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14. Number of new education areas being introduced</td>
<td>Numerical</td>
</tr>
</tbody>
</table>

While this tool cannot capture impact on health status, the KOTM BSc is a first step in the creation of a First Nations-focused BSc and in the development of First Nations-specific telehealth indicators. With this tool, KO plans to systematically document and demonstrate value to communities, government-funders, clinicians and partner organizations.

The KOTM BSc project was completed April 1st 2008. The BSc will now be integrated into the organization’s core functions. The information it generated during the piloting of the tool (using 2007 figures) has already provided useful feedback on what works, and on areas that require attention. This tool will
provide stakeholders with meaningful information on strengths, trends and opportunities for improvements to the KO telemedicine program. The information generated through this tool will make an important contribution to KO demonstrating value and advocating for telehealth sustainability. Other First Nations and Inuit organizations will find benefit from reviewing this tool and adapting it to their needs.

Conclusions

First Nations living with complex morbidities face considerable challenges in accessing appropriate care. A key issue resides with the complement of on-reserve health programs funded by FNIHB, especially in communities that are not served by Nursing Stations. This results in avoidable hospitalizations, and increased health care costs for the provinces. Perhaps more important, the current system results in pain and suffering, that could be avoided at least to some extent with improved local access to secondary and tertiary prevention (Lavoie, 2008).

Telehealth provides an opportunity to address some of these issues. Arguing for the deployment of telehealth in First Nations communities is challenging, and the creation of appropriate indicators is key. It remains however important to recognize that telehealth will realize its full potential as an intervention if, and only if shortcomings in the financing of on-reserve health service programs are addressed. Researchers and practitioners working to promote telehealth in the First Nations environment need to take a whole system approach when assessing the potential health gains to be accomplished. Shortcomings to the system itself should not be attributed to telehealth. And shortcoming to this system will not be resulted by telehealth. Both strategies are important, and must be pursued concurrently in order to improve outcomes for First Nations.

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Policy, Department of Community Health Sciences, Faculty of Medicine, University of Manitoba.


