

INTEGRATING TELEHEALTH INTO ABORIGINAL HEALTHCARE: THE CANADIAN EXPERIENCE

ABSTRACT

Telehealth, the use of information communication technologies to deliver health care over distance, has been identified as a key mechanism for improving access to health services internationally. Canada is well suited to realize the benefits of telehealth particularly for individuals in remote, rural and isolated locations, many of whom are of Aboriginal descent. The health status of Canada's Aboriginal population is generally lower than that of the non-Aboriginal population emphasizing the need for new health care solutions. The challenges associated with implementing telehealth are not unique to Aboriginal settings but, in many instances, are more pronounced as a result of cultural, political and jurisdictional issues. These challenges are not insurmountable however, and there have been a number of successes in Canada to serve as a blueprint for a national strategy for sustainable Aboriginal telehealth. This review will highlight challenges and successes related to telehealth implementation in Canadian Aboriginal communities including: geography, technical infrastructure, human resources, cross-jurisdictional services, and community readiness. The need for champions within government, community and health care settings and the use of a needs-driven and integrated approach to implementation are highlighted. Several Canadian examples are provided including lessons learned within the MBTelehealth Network. (*Int J Circumpolar Health* 2004;63(4):401-414)

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Sarah Muttitt^{1,2}
Robert Vigneault³
Liz Loewen^{1,4}

¹ MBTelehealth,
Winnipeg Regional
Health Authority, Canada

² Department of Pediatrics and
Child Health, University of
Manitoba, Canada

³ SIS Business Alliance,
Kanata, Ontario, Canada

⁴ Faculty of Nursing, University
of Manitoba, Canada

INTRODUCTION

Telehealth, defined as the use of information and communications technology (ICT) to deliver health services, expertise and information over distance, geographic, time, social and cultural barriers, has been identified as a key mechanism for improving access to health services (1). Canada, with its widely dispersed population is well suited to realize the benefits of telehealth particularly for individuals in remote, rural and isolated locations, many of whom are of Aboriginal descent. While telehealth may have not yet reached the volume and maturity required for large-scale randomized studies, consumers and health care providers alike have recognized the clinical value of telehealth. In a recent literature review, telehealth in rural and remote locations has been found to improve access to services, to be well accepted by patients and community members, and to reduce costs related to travel for health services (1). Despite potential benefits resulting from telehealth implementation, there are a number of challenges related to infrastructure, organizational, and jurisdictional limitations which must be addressed to continue to expand telehealth in remote Aboriginal communities.

Background

The Canadian Constitution recognizes three groups of Aboriginal people – First Nations, Inuit and Métis (2). The largest percentage of the Aboriginal population is the First Nations (Registered and Non-Registered Indians with respect to the Indian Act) who comprise approximately 62% of the total population. The Métis (of European and First Nations descent) population constitutes approximately 30% of the Aboriginal population, while the Inuit (Indigenous peoples of the Arctic) population accounts for an estimated 5% of Canada's Aboriginal peoples. In total, the Aboriginal population comprises 4% of the Canadian population of over 31 million (3,4). Aboriginal groups are distinctive in language, culture and tradition. Importantly, from a telehealth perspective, Aboriginal populations are also unique from each other as they fall into distinct health jurisdictions each with policies related to health services.

Geography

Canada covers a vast land area of just under 10 million square kilometers(km²) (5). The delivery of health services to Canada's relatively

small population across this large geographic area is a considerable challenge. This challenge is particularly evident within Northern Canada as the climate is harsh, transportation options can be limited, and most large health centers and specialty services are located in Southern Canada. Aboriginal communities are among the most geographically remote and isolated communities in Canada. Using Health Canada's definition of community status, more than 95% of the Inuit communities are classified as remote-isolated or isolated, while 235 of the 626 of the First Nations communities (also known as reserves) are classified as semi-isolated, isolated or remote-isolated. A significant percentage of Métis communities also fall under the semi-isolated, isolated or remote isolated categories (see Table I) (6).

Table I. Community status definitions (6).

Type	Title	Description	% of Communities
Type I	Remote Isolated	Communities have no scheduled flights or road access and minimal telephone or radio service.	3.5%
Type II	Isolated	Communities have scheduled flights, good telephone services, but no road access.	17.9%
Type III	Semi-Isolated	Communities have road access, but have physician services greater than 90 kilometres away.	14.4%
Type IV	Non-Isolated	Communities are accessible by road and are less than 90 kilometres from physician services.	64.2%

Health care system

In Canada, the majority of health services are publicly financed through a national health insurance plan administered at the Provincial and Territorial level (7). The Canada Health Act sets out five key principles to which each province/territory must adhere: public administration, comprehensive coverage, universal coverage, portability and accessibility. The expectation that all Canadians will have access to health services has been a key driver for the growth of telehealth in Canada. In two recent reports reviewing the health care system in Canada, telehealth was identified as a central mechanism for improving care for individuals living in rural and remote locations of the country (8,9).

Funding for Aboriginal health differs as it falls under multiple jurisdictions. With respect to First Nations persons, the Government of Canada assumes all health care costs for the on-reserve population through the First Nations and Inuit Health Branch (FNIHB), and assumes costs for providing access to off-reserve medical services being provided by Provincial or Territorial governments through the Non-Insured Health Benefits program. The Inuit population, largely located within the geographical borders of Canada's northern territories (Yukon, Northwest Territories & Nunavut), receive the majority of their health care services directly from the territorial government, although FNIHB does directly deliver wellness based programs including addictions counseling, and education in diabetes, fetal alcohol syndrome/effects and tobacco reduction. Currently, there is no direct federal government funding and very few health programs directed at the Métis population. The Métis, depending on their location, receive health services directly from either the provincial or territorial governments (10).

Health status

There are marked differences between the health status of Canada's Aboriginal and non-Aboriginal populations. The life expectancy of Aboriginal peoples in Canada is lower than the non-Aboriginal population. Additionally, the Aboriginal population has higher prevalence of diseases such as diabetes, human immunodeficiency virus (HIV) and tuberculosis than non-Aboriginal populations, and there are recent studies that indicate that mental health and addictions issues are much more prevalent in Aboriginal peoples than in any other segment of the Canadian population. Alarming, child infant mortality rates for the Aboriginal population are three times the Canadian rate, and the suicide rate is up to six times the rate of non-Aboriginal populations. Poor health status is further compounded by issues such as geographic isolation, poor environmental conditions, inadequate housing and inconsistent delivery of health care services in the community. Access to health care does not fully explain differences in health status as Aboriginal peoples access the health care system at a higher rate than non-Aboriginals yet demonstrate poorer overall health status (3,6,11). Telehealth provides a tool to facilitate more effective and appropriate delivery of health services in Aboriginal jurisdictions.

Aboriginal telehealth

Sustained telehealth activity in Canada started in the Province of Newfoundland in 1975 with a satellite based, one-way video/two-way audio network providing education and consultation between one referral centre and four remote hospitals (12,13). Since that time, telehealth in Canada has grown with all Provinces and Territories currently having some type of telehealth program in place. Canada Health Infoway has identified 34 different networks across Canada reaching 10-15% of rural and remote communities in Canada and approximately 5% of First Nations communities (14). Statistics on telehealth utilization by Aboriginal peoples are also difficult to access due to the multiple jurisdictions and funding sources and the fact that Aboriginal patients frequently access telehealth services in non-Aboriginal health care facilities or communities.

The Canadian experience: challenges and critical success factors

Many of the challenges faced in implementing telehealth are not unique to Aboriginal settings, but, in many instances, they are more acute due to cultural, political and jurisdictional issues. The challenges are not insurmountable, however, and there have been regional and community successes in Canada to serve as a blueprint for a national strategy for Aboriginal telehealth. Table II provides a summary of selected telehealth programs with services directed towards Aboriginal persons in Canada.

Geography

Many of the challenges related to implementing telehealth in Aboriginal communities are directly attributable to geography. As isolated communities lack consistent road access, telehealth initiatives in remote communities incur high costs related to moving equipment and/or resources to and from the communities. Given the geography, it is not inconceivable for travel and shipping to account for up to 40% of the cost of a telehealth project focused on a northern Aboriginal community and irregular transportation access adds to the time required to implement new sites. In a competitive climate, where various jurisdictions are competing for dwindling telehealth dollars, higher costs in isolated communities

Table II. Selected telehealth programs in Canada (25).

Program	Location	Start Date	Current Funding Source/Type	Telehealth application		connectivity		Types of Services					# of Sites		
				Video-conferencing	Store and Forward	IP	ISDN/SW 56	Satellite	Clinical	Continuing Education	Admin	Visitations	Aboriginal	Non-Aboriginal	
Alberta First Nations TeleHealth Program ¹	Alberta	2001	Federal – ongoing	yes	-	no	yes	no	yes	yes	yes	-	-	24	0
Ikajuruti Inungnik Ungasiktumi (IIU) Network ²	Nunavut	1999	Territorial – ongoing	yes	yes	yes	-	yes	yes	yes	yes	yes	yes	15	-
Keewaytinook Okimakanak/NORTH Network Partnership Pilot ³	Ontario	2001	Federal – project	yes	-	yes	no	yes	yes	yes	yes	yes	yes	12	-
MBTelehealth Network ⁴	Manitoba	2001	Provincial – ongoing	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	2	21
Western NWT Health Network (WestNet) ⁵	Northwest Territories	1998	Territorial – ongoing	yes	yes	yes	-	yes	yes	yes	-	-	-	12	0
Yukon Telehealth Network ⁶	Yukon	2001	Territorial - ongoing	yes	yes	yes	-	-	yes	yes	-	-	-	9	0

URL

¹ http://www.hc-sc.gc.ca/fnihb/phcph/telehealth/alberta_telehealth.htm² <http://www.gov.nu.ca/hsssite/telehealth.shtml>³ <http://health.knet.ca/index.html>, <http://www.northnetwork.com>⁴ <http://www.mbtelehealth.ca>⁵ http://www.hlthss.gov.nt.ca/Features/Programs_and_Services/progandserv.htm⁶ <http://www.hss.gov.yk.ca/prog/cn/telehealth.html>

acts as an inhibitor to acquiring project dollars. Despite this, telehealth continues to expand into some of Canada's most Northern and isolated Territories due to community demand and as a result of Federal initiatives to support health care reform and technology expansion. As the number of telehealth sites increases, some issues related to distance and geography are mitigated and the costs related to connecting and supporting additional sites decrease although telehealth has not yet reached the volume required for maximum benefit.

Technical infrastructure

Technical infrastructure is a key challenge related to telehealth implementation in Aboriginal communities. Only 28 of 625 First Nations communities currently have access to broadband services and many Aboriginal communities are still connecting, if at all, to the Internet over dial-up plain old telephone systems (POTS). The lack of broadband access in Aboriginal communities is related to geography and also to limited financial incentives for private sector investment. With the exception of government facilities such as the health center, police station or local band office, there has been little consumer demand for broadband. Private sector estimates indicate that as few as 2% and as many as 5% of Aboriginal homes have personal computers (15). From a telecommunications perspective, there is not sufficient volume for a viable business case for providing broadband to these small, remote communities.

For some of the Aboriginal communities, satellite has become a viable, although sometimes cost-prohibitive, alternative for acquiring broadband. In response to this, the public sector through Industry Canada has launched programs aimed at providing broadband solutions to rural, northern and isolated communities through the Broadband for Rural and Northern Development (BRAND) and the National Satellite Initiatives (NSI) (16). These initiatives may provide much needed broadband access to Aboriginal communities, but it will be through a dependency on government funding both for implementation and sustainability dollars and this cannot be considered a stable basis for continued growth.

Human resources

Retention and recruitment have been identified as a major obstacle to providing health care services to First Nations communities (17). While telehealth and informatics have been identified as a solution to retention, the majority of telehealth programs in Canada utilize a telehealth site coordinator, often a nurse or community health worker, thus requiring additional human resources in each site. Communities become dependent on a designated telehealth resource when one person holds responsibility for that role and when that resource leaves, the program suffers greatly or may cease to exist. The Alberta First Nations Telehealth Project (AFNTP) utilized a new framework to avoid a dependence on dedicated human resources. The AFNTP is an e-health/telehealth network serving 41 First Nations in the province of Alberta with a focus on developing the technical infrastructure (both

connectivity and equipment), training users in equipment operations, implementation of programs focused on community needs such as diabetes, and continuing education for remote health care workers. The program emphasized training and ensuring technical confidence for all health care professionals in the community. Now entering its fourth year of operations without site coordinators, this model provides a successful example of an alternate solution for the deployment and sustainability of telehealth programs in Aboriginal communities.

Cross jurisdictional services

First Nations communities are unique within Canada's model of insured health services. Located geographically within one legal and political jurisdiction, First Nations peoples receive health services on-reserve from one jurisdiction, the Federal government, but receive off-reserve specialty care from another (Province or Territory). The capacity for telehealth to deliver specialty services to First Nations communities 'virtually', without physically leaving the reserve, blurs traditional jurisdictional lines and can be a significant barrier to smooth telehealth implementation. While only the physical location of service delivery changes, funders and service providers must reexamine already complex relationships and obligations in order to support seamless integration of specialty services into telehealth programs.

The AFNTP successfully reduced the need to address cross-jurisdictional issues by initially deploying community-based wellness programs aimed at disease prevention and education rather than tertiary specialty services. With successful programs serving as the foundation for telehealth in the communities, the network is now better positioned to expand programming to include access to specialty services and is in the process of developing a Memorandum of Understanding with the province for the provision of these services via telehealth. Despite this precedent, there remains an urgent need to strive for new cross-jurisdictional agreements that recognize that information technology is making health less about geographic space and more about enhanced health care to communities.

Readiness

Prior to telehealth investment, there is a clear need to determine the 'telehealth readiness' of communities, in order to reduce the risk of failure and losses in time, money and effort. Although there is a fundamen-

tal requirement for sufficient bandwidth to support telehealth, non-technical organizational factors are equally important to successful telehealth implementation (18). The perception of need and the ability and willingness of users to adapt to the changes associated with the introduction of telehealth can have enormous impact on adoption and utilization. Telehealth success depends upon selecting communities or organizations that are aware of telehealth and its benefits, have a genuine need for and commitment to telehealth, and can provide or acquire the capacity to support and resource telehealth beyond implementation.

The National First Nations TeleHealth Research Project, initiated in 1998, was not the first initiative to implement telehealth in First Nations communities, however it was the first concerted effort on a Pan-Canadian scale (19). With communities in five different provinces, each reflecting regional variation associated with healthcare delivery to First Nations, the project offered a unique opportunity to identify and address both readiness and cross-jurisdictional issues. Despite careful selection, not all communities selected were able to sustain telehealth. Fort Chipewyan, the most successful of the five communities chosen for the project, demonstrated readiness across a broad spectrum of factors including an identified telehealth service need, community and health care provider 'buy-in', collaborative partnerships in place, and network connectivity. The program was soon integrated into a larger telehealth initiative providing the structures, processes and support to ensure longer-term sustainability.

Government, community, and health care champions

There has long been a recognition of the need for clinical champions to spearhead clinical telehealth activities for new projects and programs. In addition to clinical champions, multiple advocates in senior positions of influence within government, organizations, and communities contribute significantly to the success and sustainability of telehealth services (20). Telehealth was initiated in the province of Saskatchewan by the Ministry of Health as a strategy to enhance recruitment and retention of healthcare workers and is included in the Saskatchewan Action Plan for Health. The Government of the Northwest Territories intends to 'telehealth enable' all communities and is actively engaged in WestNet Telehealth Strategic Action Planning to restructure governance and operations to better serve the te-

lehealth role in primary community care. There is strong commitment from the Department of Health and Social Services in Nunavut to expand telehealth to more sites and develop the service agreements with other jurisdictions that will drive telehealth utilization. This level of senior government support reflects the desire to develop telehealth as a fully integrated component of healthcare and contributes significantly to more widespread telehealth adoption and long-term sustainability.

Community engagement is also a high priority for successful telehealth programs. Keewatinook Okimakanak (KO) Telehealth provides telehealth connectivity to numerous locations in Ontario, including 12 First Nations Communities with expansion to an additional 12 sites in the Sioux Lookout Zone underway. Prior to deployment, KO participated in an intensive telehealth information and education program including meetings with Health Committees, Band Councils, and the general public to introduce the telehealth concept, identify opportunities and respond to concerns. KO Telehealth harnessed the interest generated in telehealth to build a grassroots network that is owned and operated by the First Nations communities themselves as a catalyst for community empowerment and ownership. These communities access a wide range of clinical and educational services from neighboring networks, NORTH Network in Ontario and MBTelehealth in Manitoba, including specialist care, ophthalmology, radiology as well as family visitations (21,22).

Needs driven

Engaging clinical staff and promoting buy-in will ensure that clinical needs are the primary focus of telehealth programs and provide optimal benefits to patients and providers. Clinical information and understanding must guide decision-making and on-going activities should focus on the areas of greatest clinical need that will have the highest impact on health care for the population being served (23). Most telehealth programs have embraced the importance of a regular and ongoing Needs Assessment process to support telehealth service development. However, there is a more recent recognition that the approach and tools applied during a Needs Assessment require modification to meet the unique requirements of Aboriginal communities. Reflective of the growth and continued interest in Aboriginal telehealth in Canada, a special interest group has developed, the Aboriginal Telehealth Knowledge Circle (ATKC). The group is supported by FNIHB and

includes participants from various First Nations Networks and sites with a goal of sharing/transferring knowledge, and developing reusable telehealth toolkits. The ATKC is also considering the potential for a pan-Canadian Aboriginal network that can provide culturally specific health care services focused on traditional approaches such as tele-spirituality, and is looking to create specialized communities that can become referral centres for other Aboriginal telehealth sites.

Integration

There has been steady growth of telehealth activities in Aboriginal communities in Canada over the past three to four years but the full potential of telehealth as a solution for healthcare needs has yet to be realized. The success of telehealth is dependent on a full and seamless integration of telehealth as part of the healthcare delivery system (24). At an organizational level, this demands that telehealth be consistently offered as a viable alternative for healthcare service delivery where appropriate. At the local health care facility level, the technology and processes must be adapted to fit with daily workflow and resources. At a telehealth program level, this involves innovative partnerships and business relationships with health and telehealth providers.

KO Telehealth is a provincial partner of NORTH Network, one of the largest and most successful telehealth networks in Canada. The relationship between NORTH Network and KO Telehealth has been successful as the applications in these communities have been developed with a First Nation focus, specific to the disease entities and needs of those communities, including wellness and prevention. NORTH Network provides the network infrastructure to support the services however, the responsibility for growing the service within the First Nations communities rests with the Band Leaders and healthcare providers in each region promoting a high level of ownership and involvement. Prior to KO Telehealth, there was an assumption that any telehealth activity would have to be heavily sponsored and developed by the federal government, as there is a lack of capacity to deploy and maintain telehealth programs in the communities themselves. KO Telehealth's ability to deploy and maintain a broadband network, develop and deliver telehealth programs, hire and train resources for the various support requirements, and successfully integrate with the larger NORTH Network serves as a strong model for the future development of First Nations telehealth.

Sustainability

While considerable time and effort is spent on the planning and implementation of telehealth, until recently, limited time and resources have been devoted to sustainability. The lack of focus on sustainability explains, in part, why many telehealth projects in health fail or falter after pilot project or grant funding ends. Although sustainability is linked to other critical success factors, planning for sustainability from the outset is a critical activity, made all the more complex in remote, isolated, under-resourced and largely 'unconnected' Aboriginal communities. Lack of funding continues to be the most profound barrier to the ongoing sustainability of telehealth in remote and isolated Aboriginal communities, where operational costs, particularly those related to infrastructure, are significantly higher. Sharing infrastructure costs between multiple communities as well as other possible network users, such as education, justice, or government, will improve the viability of telehealth in small, remote communities and result in affordable telecommunications costs which are critical to the expansion and sustainability of telehealth in many of Canada's neediest areas.

Lessons learned for MBTelehealth

Manitoba has the largest concentration of First Nations of all provinces in Canada, and, as such, serves more First Nations clients through the provincial health care system than any other Canadian province. Given that the Manitoba First Nations have a higher prevalence of diabetes, higher rates of injury and higher hospitalization rates than non-First Nations, the provincial health care system has historically struggled to meet the needs of First Nations clients within the existing system (11). MBTelehealth, a 24 site province-wide telehealth network, is looking to the Canadian experiences with Aboriginal telehealth to guide a proposed expansion to First Nations communities in an effort to enhance the delivery of health services. In assessing 'telehealth readiness', an environmental scan has been conducted with a primary focus on identifying those communities with more immediate access to the prerequisite broadband infrastructure as well as a strategy for sustainability funding. A broader readiness assessment will follow and serve as an opportunity to engage and educate community stakeholders and identify specific clinical needs that could potentially be met through the use of telehealth. MBTelehealth has added a dedicated resource of First Nations descent to assist with site and servi-

ce development and lead the development of community capacity to support telehealth. In order to ensure cross-jurisdictional cooperation, relationships are being built at multiple levels including Manitoba Health, Health Canada's First Nations and Inuit Health Branch, and the University of Manitoba's J.A. Hilde Northern Medical Unit (NMU), which provides on-site physician services throughout Northern Manitoba and Nunavut. The partners share a vision for the integration of telehealth into current regional and provincial health service delivery to support health and wellness in First Nations communities. By integrating these new First Nations sites into MBTelehealth operations from the outset, the communities will have access to existing provider services and telehealth program management which will contribute to early utilization and success. By building on the Aboriginal telehealth experience from across the country, it is hoped that Manitoba will avoid many of the pitfalls that impacted long term success in earlier projects and demonstrate the real opportunity for telehealth to contribute to the better health status of First Nations peoples.

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Sarah Muttitt, MD, FRCPC, FAAP, MBA
 Department of Pediatrics and Child Health
 University of Manitoba
 536 John Buhler Research Centre, Winnipeg, MB R3E 3P4
 Canada
 Email: smuttitt@ms.umanitoba.ca