Technology-Enabled Hubs in Remote Communities: Project Update

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INTRODUCTION

The purpose of this project update is to inform key stakeholders, funders and interested parties of the progress being made toward developing a pilot-ready opportunity for information and communication technology to be used in supporting collaborative risk-driven intervention efforts in remote communities. While some of the preliminary findings shared in this update may very well shape the design of the final pilot project, additional research that is currently underway may also have a significant impact on the final outcome. Therefore, readers of this project update should consider this to be an exploratory glance at potential options for tech-enabled Hubs in remote communities. Additional interviews and consultation with key stakeholder groups will help to narrow some of the options presented herein.

The next section in this update provides a brief background on the project and what is to be accomplished. The third section outlines the activities undertaken to date. Next, this update identifies some of the successes and challenges of the project so far. The fifth section outlines some of the key findings of the literature scan on three topics: the Hub model, adaptations of other human service initiatives, and information and communication technology solutions that best facilitate real-time, cross-sector collaboration. The sixth section outlines some of the major themes appearing in the consultation interviews with three key cohorts: Hub practitioners, human service initiative adapters, and information and communication technology stakeholders. The seventh section of this project update offers some potential designs for a future pilot project. The final section outlines the remaining work required within this current project.

PROJECT BACKGROUND

The purpose of this project is to conduct a feasibility and planning exercise that supports effective operations of technology-enabled Hubs in remote communities. The project aims to outline a pilot-ready ``in remote Saskatchewan communities.

The Hub model, rapidly expanding across Canada, provides a venue for human service professionals to share limited information in order to plan and deploy an intervention team to mitigate multiple risk factors before crisis occurs. The Hub model, through a highly-disciplined discussion process, allows for face-to-face collaboration to occur between different sectors of the human service delivery system. In

remote communities however, accessible face-to-face interaction among human service providers is not always an option. When individuals or families are facing situations of acutely-elevated risk, it is critical that support be mobilized to mitigate such risk. Geographic barriers often prevent this type of support from being mobilized effectively.

Finding a way for ICT to enable human service providers to apply the Hub model in remote communities could improve opportunities for risk reduction. The purpose of this project is to conduct research on ICT options in Saskatchewan, explore adaptations of the Hub model to fit the nee ds of remote communities, consult with key ICT and CRDI professionals, and lay out a detailed plan for community safety and well-being stakeholders in Saskatchewan to move forward with technology-enabled Hubs in remote communities.

Overall, this project is driven by the following objectives:

1) Develop understanding for how the Hub model can be applied in remote communities by intersecting collaborative risk-driven intervention with advanced information and communication technologies.

2) Develop a body of knowledge on information and communication technologies that have enabled similar collaborative interactions in Canada and beyond.

3) Determine how a virtual environment for cross-sector collaborative risk-driven intervention can occur in Saskatchewan.

4) Provide a go-forward plan for community safety and well-being stakeholders to consider in piloting a technology-enabled Hub for remote communities.

PROJECT ACTIVITIES TO DATE

To date, a number of activities have been undertaken to prepare for the development of a pilot project that will see ICT enable CRDI efforts in a remote community. Although not in the original design of this project, a majority of these activities will end up occurring twice—once in an *exploratory* stage and one in a *planning* stage. This doubling of activities is the result of a number of dynamics realized during implementation of the original methodology:

- Information and communication technology literature itself is often out-paced by rapid and continuous changes in technology and innovation. This will require a revisit to key literatures in this field towards the end of the project.

- During consultations with Hub practitioners, it became clear that there was a lot more behind the configuration and design of the Hub itself than originally forecasted. In other words, technology aside, finding the right people from the right areas of the province to work together in a Hub environment will require additional consultation and verification from potential partners.

- Both the literature and consultation process highlighted the importance of making sure that services were accessible post-intervention. Otherwise, any efforts to mobilize an intervention without guaranteeing access to services could potentially be destined for failure. Therefore,

exploratory dialogue with human service professionals identified the willingness of providers to consider providing services to remote clients through various ICT formats. Follow-up verification will be required to confirm both capacity and willingness among agency partners to actually provide these services in a virtual environment.

With respect to the two stages of activities, much of the work to date has focused on *exploratory* activities. At the time of this project update, 80 individuals and 125 literature contributions have contributed to the development process. Table 1 provides a summary of these activities to date.

Table 1. **Exploratory Activities Undertaken to Date**

ACTIVITY	DESCRIPTION
Project Planning	Identified key project stakeholders who will use the final deliverable in their implementation of a technology-enabled Hub pilot project. These include RCMP, Building Partnerships for Community Safety and Well-Being, Ministry of Social Services, Ministry of Health, Ministry of Justice, Ministry of Education, Ministry of First Nations, Metis and Northern Affairs, Public Safety Canada, Aboriginal Affairs and Northern Development Canada, Health Canada.
Literature Scan	Initial activities included a literature scan on three different topics: • The Hub model, including its formation, process, past evaluation results and adaptations from the original model. • Other human service model adaptations made to overcome geographic and resource barriers for remote communities. • ICT solutions that best facilitate real-time, cross-sector collaboration.
Hub Adaptation Consultations	Consulted with several key Hub stakeholders, including: • 3 key advisors on the Hub model • 1 of 2 principal architects of the Hub model • 4 early adapters/champions of the Hub model • 12 Hub discussants in Prince Albert (representing police, education, justice, victim services, mental health, addictions, social welfare, child protection) • 10 Hub discussants in Lloydminster (representing education, justice, victim services, social welfare, child protection) • 11 Hub discussants in Saskatoon (representing police, education, justice, victim services, mental health, addictions, social welfare, child protection)
Technology Format Consultations	Consultations with several ICT stakeholders, including: • 1 respondent from the Canadian Association of Chiefs of Police ICT Committee • 4 respondents from various ICT development companies • 1 respondent from Saskatchewan Ministry of Justice • 1 respondent from Health Canada • 2 respondents from northern industry corporations
Human Service Stakeholder Consultations	Consultations with several human service professionals, including: • 12 members of The Regina Intersectoral Partnership (representing police, education, justice, mental health, youth support, social services) • 7 members of Community Mobilization Prince Albert's Centre of Responsibility • 2 respondents from Keewatin Yatthé Regional Health Authority • 3 respondents from Saskatchewan Ministry of Justice • 3 respondents from RCMP "F" Division • 1 respondent from Northern Sport Culture and Recreation District • 1 respondent from University of Regina
Data Analysis	Preliminary analysis of data collected to date

SUCCESSES AND CHALLENGES

Throughout the first few months of this project, a number of successes and challenges have been presented. While none of these have a tremendous impact on the project, good or bad, they are certainly worth sharing with key stakeholders, funders, and interested parties reading this report. Table 2 summarizes the successes and challenges encountered so far.

Table 2. **Successes and Challenges of Project to Date**

SUCCESSES	CHALLENGES
- strong interest among Hub practitioners to participate in the consultation process - access to comprehensive information and expertise on the Hub model - interest among northern stakeholders to participate in the consultation process - growing application of ICT in other human service fields across Canada/United States - wide enthusiasm for the intent of the project - energization of respondents following participation in the consultation process	- getting Hub practitioners to think outside the table concept of the conventional Hub model - identifying relevant non-sales oriented ICT professionals - connecting with higher level government officials - respondents tend to concentrate on ongoing logistics of resourcing a tech-enabled Hub and securing service access post-intervention - by starting with no pre-conceived notions of an optimal ICT format, the process of identifying a preferred format is taking longer than expected

KEY LITERATURE REVIEW FINDINGS

The literature reviewed in preparation of this project provided a solid foundation of knowledge on three key areas: the Hub model of collaborative risk-driven intervention, adaptations of other human service initiatives in remote communities, and applications of ICT in the human service sector[1]. The literature in each of these three areas helped to identify concept, definition, practice, and both key ingredients and lessons learned in each respective area. The information gathered through the literature scan helped to formulate the consultation process, and will certainly help to shape the development of a pilot project being planned through this effort. To summarize the key findings of the literature scan, Table 3 provides the key points offered in each body of literature.

Table 3. **Summary of Literature Findings***

AREA	SUMMARY OF LITERATURE FINDINGS
Collaborative Risk-Driven Intervention	- The Hub model involves a multi-sector collaborative process of risk detection, disciplined and limited information sharing, and rapid intervention aimed at mitigating risk before harm occurs. - The Hub model was first launched in Prince Albert, SK in 2011. Since then, it has been replicated nation-wide with very little deviation from the core model. - The Hub model involves four key principles: protection of privacy, commitment, collaboration and action. - In practice, nearly all Hub tables operate through in-person, regularly-scheduled meetings. - Many Hubs serve a mix of urban and rural areas where services are accessible. - Some adaptations of the model involve single-sector interventions and healing circles; on-demand Hub meetings that may occur over the telephone when the need arises; and linkages

[1] For scan results, see Nilson (2016).

	between the Hub discussion process on ongoing coordinated case support. - Past evaluations of the Hub model focused on satisfaction, benefits, impact on service, service access, collaboration, risk mitigation, challenges, successes, and improvements.
Adaptations of other Human Service Initiatives in Remote Communities	- The literature on adaptations of other human service initiatives identified a number of key factors to consider: capacity, resources, language, culture, infrastructure, transport, and technology. - Case studies on 5 human service initiatives that were adapted in remote communities revealed a number of key lessons to consider: • Be prepared to adjust expectations and roles. • Strive for equal ownership and a shared value of the initiative among community partners. • Allow for more time in the preparation stage than in other less remote environments. • Be willing to adjust training and logistical needs to meet service provider capacity and need. • Look within the community to find and mobilize what resources are available (as opposed to focusing on resources that are not available). • Consider a regional perspective for expanding service access and resource availability. • Implement video communication technology to overcome limitations in service access or quality. • Incorporate culture and tradition into delivery of the model. • Be prepared for variation in the adaptation practices across rural and remote communities. • Keep the model simple and easy to implement. • Make sure ongoing support is accessible and responsive to community needs. • Allow cultural infusion, which will foster community ownership, stakeholder buy-in, and target group engagement.
Information and Communication Technology	- The field of ICT changes and expands much more rapidly than other fields of science and technology. - ICT is an inherently multi-disciplinary field with very few global definitions or concepts. - The most general consensus is that ICT refers to a technology with diverse applications, that—via appropriate infrastructure and device(s)—enables real-time communication between two or more recipients through text, voice and/or video signal. - The most common applications of ICT in the human service field include video-conferencing, tele-conferencing, text-based interaction, and remote presence technology. - Two of the most important aspects to consider in applying ICT solutions within a community project are capacity and leadership. - The used of ICT solutions in human services differs per sector and jurisdiction. Some uses include data collection and storage, service provider communication, training, information sharing, client access, and service delivery. - Evaluations of ICT applications in the human services reveal increased client access to service, reduced service provider workload, and bridged geographic distances.

*Literature sources reviewed in this scan are available in appendix.

Overall, the literature review has helped identify some of the key pieces of knowledge required to plan a pilot project involving tech-enabled applications of collaborative risk-driven intervention in remote communities. The key themes of the literature review have not only helped shape the consultation process, but have prompted attention to less obvious but important details in successful applications of ICT solutions within human service delivery.

PRELIMINARY CONSULTATION FINDINGS

Throughout the consultation process, a number of key themes and questions were pursued with each of the respondent cohorts. These include *key ingredients*, *potential barriers*, *significant factors*, *technology considerations*, *appropriate formats*, *adaptability*, *Hub meetings*, *collaborative intervention*, and *service provision*. In addition to these themes, three main concerns were highlighted by several consultation respondents.

First, many of the Hub practitioners were initially resistant to the idea of a virtual Hub, simply because it lacks *conventional human interaction*. However, when confronted with the reality that some communities literally have no services, many respondents were quick to realize the utility of a tech-enabled Hub. In the end, there grew considerable enthusiasm and support for the concept of a tech-enabled Hub among consultation respondents.

Another major concern during the consultation process was the fact that not only are remote communities lacking resources for a proper onsite intervention, but they have no services for ongoing support post-intervention. As a result, a lot of dialogue during the consultation process focused on the actual day-to-day service provision to clients engaged through a tech-enabled Hub. To date, many of the consultation respondents were favorable to exploring ways in which they could provide services to remote clients in an ongoing virtual capacity.

A third major concern among consultation respondents was the resource makeup of a so-called tech-enabled Hub. Assumingly regional and/or provincial in nature, there were numerous questions around who would make up the tech-enabled Hub, and more significantly, who would fund it. This sparked conversation around a number of different options, designs, locations and governance structures. Ultimately, several consultation respondents favoured a purely virtual Hub with discussants located in different parts of the region (or province). This allows for more physical coverage of at least one team member, to be accompanied by a local human service provider (e.g. referring agent), and the rest of the virtual intervention team.

Overall, there was a variety of suggestions and ideas provided during the consultation process completed to date. These suggestions provide a lot of new questions to consider in planning a pilot project. In aggregate form, feedback from respondents in the Hub stakeholder, general human service provider, and ICT cohorts is summarized within Table 4.

Table 4. **Summary of Preliminary Consultation Findings by Theme**

THEME	FEEDBACK FROM CONSULTATION RESPONDENTS
Key Ingredients	- Partners must have the understanding that the investment in technology and people up front will save both harm and cost in the long-run. - Local community leaders who will support and champion the initiative. - Buy-in to the idea that this initiative will better serve community needs, simply because driving human service professionals in and out of the community is not an option. - Considerable communication that is clear and understood, both during the planning and implementation stages of the project. - The project will require a central coordinator to plan meetings and mobilize the right partners. - There must be a willingness among agencies to commit to the project. - Developers must point out key aspects of the Hub model that cannot be adjusted or changed to meet local and/or technology needs. - The pilot team needs to be supportive and flexible.

	- The community must have ownership over the process. - Clear role understanding among the partners and their staff/management. - Clear protocol and structure around use of technology and Hub activities. - Proper training and both accessible and continuous support. - Discussants in a tech-enabled Hub must be experienced, comfortable with technology, and dedicated to developing professional and client relations in a virtual environment.
Potential Barriers	- In many communities, the only onsite agency to make a physical appearance may be the RCMP—which may present initial resistance from unsuspecting clients. - Turnover of staff and leadership in remote communities is a constant threat to new initiatives. - Constant lack of anonymity and confidentiality in northern communities. - Local dynamics and changing priorities may drift attention away from the project. - Suspicion, unfamiliarity and/or a lack of confidence in technology within remote communities. - Historical distrust for government agencies among remote community members. - Access to local databases/records to identify client services/needs during intervention. - Ability to form synergy among a team of remote human service providers. - Difficulty forming a bond or rapport with clients through a screen. -Technological connectivity is a challenge in remote communities[2]. - Additional safeguards for privacy and information sharing may be required in a virtual environment.
Significant Factors	- Small remote communities want the same services as larger communities. - Social problems know no geographic barriers or jurisdictional boundaries. - Role out of pilot must be slow and supported; not a massive 'dump and replicate' exercise.
Technology Considerations	- It is important to consider what is *available now* vs. what is *available in the future*[3]. - Important to consider technology access, strength, reliability, capacity, acceptance, support. - The technology will be used across various agencies, so it may involve joining separate IT infrastructures. - It may be ideal to identify a single leader from the tech side to provide both a system and ongoing support. This could be government or a private vendor. - Technology capacity in the North is limited and inconsistent. - Many northern communities have existing Telehealth infrastructure in a clinical setting. Their upkeep, use and application vary per community. - It is critical to minimize interruptions and maintain consistent performance of the solution. - Local technology capacity including bandwidth, data coverage, network access. - Complete proper testing of the technology before introducing it to the community. - People of all ages and socioeconomic backgrounds are becoming increasingly comfortable with technology—so take advantage of that. - Both human service providers and clients will need training and support in using the technology. - The technology itself must be dependable and supported by experienced technicians.
Appropriate Technology Formats	- Mobile devices are critical for the intervention (e.g. satellite video), whereas more stationary applications could be used for ongoing services (e.g. Internet video). - Teleconferencing is not a preferred format, as it is not very engaging or personal. - Videoconferencing is a preferred format for many human service professionals. - The solution must be mobile-friendly, durable and can withstand extreme climates and battery dependence. - Involve industry partners in realizing the technology format best suited for this application.
Adaptability	- Although a privacy impact assessment has been conducted on the conventional Hub model, a second one may be required for a tech-enabled Hub. - Although conventional Hubs are resourced locally, a remote Hub may have to be regional or

[2] Also supported in findings by Jewell et al. (2016).
[3] Ibid.

	provincial in its resourcing and location of discussants.
Tech-Enabled Hub Meetings	- So long as technology can accommodate a live discussion process, very little should change during the actual application of the Hub's *Four Filter Process*. - It is important to establish a team that can continue working together on different discussions. - May increase human service provider presence and frequency of contact with clients and one another. - The team itself should be dedicated, consistent and provided with sharing opportunities.
Tech-Enabled Collaborative Intervention	- May be convenient and the only option, but is very impersonal. - Can potentially be mobilized much quicker than even an in-person intervention. - Has the potential to involve others on-demand as new needs are discovered. - Clients may feel that the intervention is less invasive when some service providers appear virtually. - In a virtual environment, less time is wasted among human service providers when a client is not home. It would be easier to do a 2nd or 3rd door knock if need be.
Tech-enabled Service Provision	- Partner agencies must commit to the ongoing provision of services through ICT. - Services will be provided from human service professionals outside of the community. This brings both opportunity (e.g. anonymity) and challenge (e.g. mistrust). - There must be a real change in mindset around service provision and the in-person legacy that follows it. Both human service providers and clients must be comfortable with an ICT format. - It may be beneficial for those human service providers who participated in the virtual intervention to also be the service provider to that client post-intervention. - Tech-enabled service provision could very well be expanded to support rural clients who do not have access to transportation required for regular visits to their human service provider. - Tech-enabled service provision may overcome many of the traditional barriers to service that clients face currently (e.g. transportation, childcare, confidentiality, comfort).

POTENTIAL PILOT DESIGNS

Throughout the consultation process, a number of different design options have started to emerge. For the most part, there was usually consistency in the delivery of service post-intervention. That almost always involved a human service provider continuing the client-care provider relationship using an ICT solution. Where differences emerged was in the actual structure, resourcing, and location of the Hub team itself. As Table 5 illustrates, it is proposed that there are three different models under which a tech-enabled Hub could operate in Saskatchewan.

Table 5. **Potential Design Types of the Tech-Enabled Hub Concept**

DESIGN TYPE	DESCRIPTION
Single Location Hub	The Hub team may be comprised of human service providers located in a single community, where they can work together in-person, but serve clients virtually. The benefit of this is strong team synergy. The challenge with this is lack of client contact and a threat of low risk detection. Depending on the number of new discussions, this design may require full-time resources to the Hub table.
Regional Virtual Hub	The Hub team is comprised of human service providers from different locations within a specific region of the province. Each Hub discussant may play the lead role in interventions within their service area, while also being supported virtually by the remaining Hub discussants. This design may allow for home agency responsibilities as well as Hub duties.
Provincial Virtual Hub	The Hub team is comprised of human service providers from different locations throughout the province. Each Hub discussant may play the lead role in interventions within their service area, while also being supported virtually by the remaining Hub discussants. Depending on the number of new discussions, this design may require full-time resources to the Hub table.

Beyond the design of the tech-enabled Hub, a number of suggestions for a technological format have also been offered. Many of the consultation respondents converged around the notion that the ICT solution can differ depending upon the stage of collaborative risk-driven intervention. As Table 6 illustrates, actual Hub meetings would be suitable in stationary videoconferencing environments like Telehealth, Goto or Skype. Actual interventions however, must be done using mobile technologies such as satellite video or 4g Internet. The actual post-intervention service provisions could be done using a variety of formats—depending upon client comfort, interest, and capacity.

Table 6. **Appropriate Technology Formats for Each Stage of Collaborative Risk-Driven Intervention**

STAGE	FORMAT(S)
Hub Discussion Process	stationary conventional web-based or institution-based videoconferencing (e.g. Skype, Goto, Telehealth)
Intervention Planning	stationary conventional web-based or institution-based videoconferencing (e.g. Skype, Goto, Telehealth)
Intervention Deployment	Remote presence technology/mobile video solutions (e.g. satellite video signal, doc-in-a-box; 4G tablet)
Post-Intervention Service Provision	Combination of stationary web-based videoconferencing (e.g. Skype, Goto); institution based videoconferencing (e.g. Telehealth); text-based communication (e.g. cell phone)

REMAINING ACTIVITIES

In the coming months, the following activities are planned for the remainder of this project:

- The first of these includes completion of remaining *exploratory* interviews. Some of these include additional consultations with ICT stakeholders, advisors and experts, along with a few human service providers currently engaged in remote presence service delivery.
- The next set of activities includes *planning* interviews with human service managers, northern community leaders and ICT service providers.
- Once the *exploratory* and *planning* consultation interviews are complete, analysis of the findings will provide direction for the design, nature, location and structure of an implementation-ready pilot project.

- The research lead will work with key project stakeholders to identify a suitable workshop format, time, and location to help launch collaborative efforts to pilot a tech-enabled Hub in one or more remote communities.
- Finally, the logistics, supporting evidence, suggested practice and design of a tech-enabled Hub pilot will be assembled into a final report made available to key stakeholders, funders and interested parties.

REFERENCES

Jewell, L., Mathias, K., Pilon, A., Brown, K., Ferguson, M., Truswell, K., Wirove, R., and Wormith, S. (2016). *A Jurisdictional Scan of the Programs and Services Available to Support the Community Reintegration of IRCS Youth in Northern Saskatchewan.* Saskatoon, SK: Centre for Forensic Behavioural Science and Justice Studies – University of Saskatchewan.

Nilson, C. (2016). *Tech-Enabled Hubs in Remote Communities: A Review of Research and Practice*. Saskatoon, SK: Centre for Forensic Behavioural Science and Justice Studies – University of Saskatchewan.

LIST OF SOURCES REVIEWED IN LITERATURE SCAN

Akomea-Bonsu, C. (2012). The Impact of Information and Communication Technologies on Small and Medium Scale Enterprises (SMEs) in the Kumasi Metropolis, Ghana, West Africa. In *European Journal of Business Management*, v.4, n.20:152-158.

Alkhaldi, G., Hamilton, F., Lau, R., and Murray, E. (2016). The Effectiveness of Prompts to Promote Engagement with Digital Interventions: A Systematic Review. In *Journal of Medical Internet Research*, v.18, n.1:e6.

Angeleski, M., Mitrevski, P., and Janeska, M. (2009). Composite Index of e-Business Strategy Readiness of the Enterprises in the Republic of Macedonia. In Davcev, D., and Gomex, M. (eds). *ICT Innovations 2009*, pp: 265-275. Berlin, Germany: Scientific Publishing Services.

Avgerou, C. (2003). The Link Between ICT and Economic Growth in the Discourse of Development. In *Proceedings of the International Federation of Information Processing.*, v.9: 373-386.

Babayan, A., Landry-Thompson, T., and Stevens, A. (2015). *Evaluation of the Brant Community Response Team Initiative: Six-month Report*. Brantford, ON: Brant County Health Unit.

Barnett, J., and Scheetz, K. (2003). Technological Advanced and Telehealth: Ethics, Law and the Practice of Psychotherapy. In *Psychotherapy: Theory, Research, Practice, Training.* V.40, n.1-2:86-93.

Bee, P., Bower, P., Lovell, K, Gilbody, S., Richards, D., Gask, L., and Roach, P. (2008). Psychotherapy Mediated by Remote Communication Technologies: A Meta-Analytic Review. In *BMC Psychiatry*, v.8, n.60.

Boniface, K., Shokoohi, H., Smith, R., and Scantlebury, K. (2009). Tele-Ultrasound and Paramedics: Real-time Remote Physician Guidance of the Focused Assessment with Sonography for Trauma Examination. In *American Journal of Emergency Medicine*, v.29: 477-481.

BPRC Implementation Team. (2013). *Building Partnerships 2013: A Forward Looking Strategy for Continued Success and Broader Outcomes Arising From the 2011 Building Partnerships to Reduce Crime Commitment*. Regina, SK: Saskatchewan Ministry of Justice.

BPRC. (2016). Building Partnerships to Reduce Crime Website. Retrieved from www.saskbprc.com.

Braga, A., and Weisburd, D. (2012). *The Effects of "Pulling Levers" Focused on Deterrence Strategies on Crime*. Cambridge, MA: Campbell Systematic Reviews.

Brannigan, N. (2010). Enhancing Leadership Capacity in ICTs in Education through Technology Enabled Collaboration. Retrieved from www.gesci.org.

Broad, G., and Doxtater, L. (2015). *Neighbourhood Resource Centre: Preliminary Report*. Sault Ste. Marie, ON: NORDIK Institute.

Brown, J., and Newberry, J. (2015). *An Evaluation of the Connectivity Situation Tables in Waterloo Region.* Evaluation report submitted to Waterloo Region Connectivity Partnership. Guelph, ON: Taylor Newberry Consulting.

Call, V., Erickson, L., Dailey, N., Hicken, B., Rupper, R., Yorgason, J., Bair, B. (2015). Attitudes Toward Telemedicine in Urban, Rural, and Highly Rural Communities. In *Telemedicine and eHealth*, v.21, n.8:644-652.

Canada, K., Angell, B., and Watson, A. (2010). Crisis Intervention Teams in Chicago: Successes on the Ground. In *Journal of Police Crisis Negotiations,* v.10, n1-2:86-100.

Caperna, A. (2010). Integrating ICT Into Sustainable Local Policies. In Silva, C. (ed.), *Handbook of Research on E-Planning: ICTs for Urban Development and Monitoring*, pp.340-364. Hershey, PA: Information Science Reference.

Chan, S., Torous, J., Hinton, L., and Yellowlees, P. (2014). Mobile Tele-Health: Increasing Applications and a Move to Hybrid Models of Care. In *Healthcare*, v.2:220-233.

Chen, S., and Macredie, R., (2010). Web-based Interaction: A Review of Three Important Factors. In *International Journal of Information Management*, v.966: 1-9.

Christensen, J. (2012). They Want a Different Life: Rural Northern Settlement Dynamics and Pathways to Homelessness in Yellowknife and Inuvik, Northwest Territories. In *The Canadian Geographer*, v.56, n.4:419-438.

Christensson, P. (2010). *ICT Definition*. Retrieved from www.techterms.com.

COACH. (2013). *2013 Canadian Telehealth Report: Based on the 2012 Telehealth Survey.* Toronto, ON: Canada's Health Informatics Association.

Cohen, D., Garibaldi, P., and Scarpetta, S. (eds.) (2004). *The ICT Revolution: Productivity, Differences and the Digital Divide*. Oxford, UK: University of Oxford Press.

Coleman, A. (2015). *Housing First Pilot Programme Evaluation*. Wellington, ON: County of Wellington Social Services.

College of Nursing. (2015). *Innovation: Remote Presence*. Retrieved from www.usask.ca/nursing/remote.

Del Grosso, P., Kleinman, R., Mraz Esposito, A., Sama Martin, E., & Paulsell, D. (2011). *Assessing the Evidence of Effectiveness of Home Visiting Program Models Implemented in Tribal Communities*. Washington, DC: U.S. Department of Health and Human Services.

DelliFraine, J., and Dansky, K. (2008). Home-based telehealth: A Review and Meta-analysis. In *Journal of Telemedicine and Telecare*, v.14:62-66.

Dimitrios, B., and O'Connor, P. (2005). Information Communication Technology: Revolutionizing Tourism. In *Tourism Recreation Research*, v.30, i.5: 7-16.

Double Robotics. (2016). *Double 2.* Retrieved from www.doublerobotics.com.

Economic Action Plan. (2014). *Homelessness Partnering Strategy*. Retrieved from www.actionplan.gc.ca.

Ehrenreich, B., Righter, B., Rocke, S., Dixon, L., and Himelhoch, S. (2011). Are Mobile Phones and Handheld Computers Being Used to Enhance Delivery of Psychiatric Treatment. In *Journal of Nervous and Mental Disease*, v.199, n.11:886-891.

Engel, R. (2013). *Establishing Partnerships to Reduce Violence: The Cincinnati Experience*. CEBCP-SIRP Joint Symposium held at George Mason University Arlington Campus. Retrieved from http://cebcp.org/wp-content/Symposium2013/Engel.

Family Service Kent. (2015). *F.I.R.S.T Terms of Reference*. Chatham-Kent, ON: Family Service Kent.

FBI. (2015). *Information Technology Strategic Plan: FY 2010 - 2015*. Washington, DC: United States Department of Justice.

Fowles, T. (2009). *Preventing Recidivism with Cell Phones: Telehealth Aftercare for Juvenile Offenders.* Dissertation submitted to University of Utah.

Gaggioli, A., and Riva, G. (2013). From Mobile Mental Health to Mobile Wellbeing: Opportunities and Challenges. In *Studies in Health Technology Information*, v.184:141-147.

Gardner, J. (2015). As Early as 2016, Robot Cops Will be Patrolling Your Streets...No, Seriously. In *The Free Thought Project*. Retrieved from www.thefreethoughtproject.com.

Gill, S., Dutta-Gupta, I., Roach, B. (2014). *The Technology Opportunity for Human Services*. Cambridge, MA: ASH Centre – Harvard Kennedy School.

Global Network for Community Safety. (2016). Global Network for Community Safety website. Retrieved from www.globalcommunitysafety.com.

Greene, K. (2016). *50 Apps for Teachers: Must-have Apps for Your Smartphones and Tablets.* Retrieved from www.scholastic.com/teachers.

Groton, D. (2013). Are Housing First Programs Effective? In *Journal of Sociology & Social Welfare*, v.XL, n.1:51-63.

Haselmayr, M. (2014). Here's Why Your Business Needs Its Own Mobile App. In *Forbes*, November 17. Retrieved from www.forbes.com.

Health Canada. (2004). *Telemental Health in Canada: A Status Report*. Ottawa, ON: Health and Information Highway Division - Health Canada.

Healthy Families BC. (2016). Action Schools! BC. Retrieved from www.actionschoolsbc.ca.

International Telecommunication Union. (2011). *Measuring the Information Society*. Geneva, Switzerland: International Telecommunication Union.

International Telecommunication Union. (2015). *Measuring the Information Society*. Geneva, Switzerland: International Telecommunication Union.

InTouch Health. (2016). *Why InTouch Health?* Retrieved from www.intouchhealth.com.

Jones, D., Anton, M., and Gonzalez, M. (2013). Incorporating Mobile Phone Technologies to Expand Evidence-Based Care. In *Cognitive and Behavioural Practice, v.22:281-290.*

Kalinowski, B. (2015). *CBO Engagement in Models of Collaborative Risk-Driven Community Safety.* A Report Prepared for the Ontario Working Group for Community Safety and Well-being. North Bay, ON: SUM-C Consulting.

Kalinowski, B. (2016). Getting the Right Care, At the Right Time: If we want to Change the Outcomes, we may have to Change Ourselves. In *Canadian Police Chief Magazine*, Winter 2016: 25-26.

Kozma, R. (2005). National Policies that Connect ICT-Based Education Reform to Economic and Social Development. In *Human Technology*, v.1, n.2:117-156.

KYRHA. (2015). *The Strength of Our Family: A Home-Based, Family-Centred, Multi-Sector Program for Helping Children and Families Exposed to Violence – Facilitation Manual*. Buffalo Narrows, SK: Keewatin Yatthé Regional Health Authority.

Masuda, Y. (1980). Computopia: Rebirth of Theological Synergism. In Masuda, Y. (ed.). *The Information Society as Post-Industrial Society*, pp.146-154. Tokyo, Japan: Institute for the Information Society.

McFee, D., and Taylor, N. (2014). The Prince Albert Hub and the Emergence of Collaborative Risk-Driven Community Safety. In *Change and Innovation in Canadian Policing - Canadian Police College Discussion Paper Series.* Ottawa, ON: Canadian Police College.

McGarrell, E., and Chermak, S. (2003). Problem Solving to Reduce Gang and Drug-Related Violence in Indianapolis. In Decker, S. (ed.). *Police Gangs and Youth Violence*, p.77-101. Belmont, CA: Wadsworth Publishing Company.

McNickle, M. (2012). 5 Ways Mobile Apps Streamline Patient-Doctor Communication. In *Healthcare IT News*, August 6. Retrieved from www.healthcareitnews.com.

Mendez, I., Jong, M., Keays-White, D., and Turner, G. (2013). The Use of Remote Presence for Health Care Delivery in a Northern Inuit Community: A Feasibility Study. In *International Journal of Circumpolar Health*, v.72:1-8.

Mendez, I., Song, M., Chiasson, P., and Bustamante, L. (2012). Point-of-Care Programming for Neuromodulation: A Feasibility Study Using Remote Presence. In *Neurosurgery*, v.72, n.1: 99-108.

Ministry of Corrections, Public Safety and Policing. (2011). *Building Partnerships to Reduce Crime*. Regina, SK: Government of Saskatchewan.

Mitra, S. (2009). Remote Presence: Technologies for 'Beaming' Teachers Where They Cannot Go. In *Journal of Emerging Technologies in Web Inteligence*, v.1, n.1:55-59.

Mwawasi, F., (2014). Technology Leadership and ICT Use: Strategies for Capacity Building for ICT Integration. In *Journal of Learning for Development*, v.1, n.2.

Nardelli, G. (2012). The Complex Relationship between ICT and Innovation in Services: A Literature Review. In Keller, C., Wiberg, M., Agerfalk, P., Jenny, S., and Lundstrom, E. (eds.), *Nordic Contributions in IS Research*, pp.1-24. Berlin, Germany: Springer.

Naylor, P., McKay, H., Scott, J., Bridgewater, L., Drummond, J., and Panagiotopoulos, C. (2009). *Exploring the Implementation and Potential Adaptation of Action Schools! BC for Rural and Remote First Nations Communities.* Vancouver, BC: Canadian Council on Learning.

Nelson, G., Stefancic, A., Rae, J., Townley, G., Tsemberis, S., Macnaughton, E., Aubry. T., Distasio, J., Hurtubise, R., Patterson, M., Stergiopoulos, V., Piat, M., and Goering, P. (2014). Early Implementation Evaluation of Multi-site Housing First Intervention for Homeless People with Mental Illness: A Mixed Methods Approach. In *Evaluation and Program Planning*, v.43: 16-26.

Ng, S., and Nerad, S. (2015). *Evaluation of the FOCUS Rexdale Pilot Project*. Delivered to the City of Toronto and Toronto Police Service. Toronto, ON: Vision and Results Inc. and SN Management.

Nilson, C. (2014a). *Risk-Driven Collaborative Intervention: A Preliminary Impact Assessment of Community Mobilization Prince Albert's Hub Model.* Saskatoon, SK: Centre for Forensic Behavioural Science and Justice Studies – University of Saskatchewan.

Nilson, C. (2014b). *Common Practices in Collaborative Risk-Driven Intervention: Preliminary Findings from a Forthcoming Report on Filter Four Activities of the Hub Model*. Saskatoon, SK: Centre for Forensic Behavioural Science and Justice Studies – University of Saskatchewan.

Nilson, C. (2015). Developing a Regional Initiative to Support Children and Families Exposed to Violence: Community Consultation Findings. Prince Albert, SK: Living Skies Centre for Social Inquiry.

Nilson, C. (2015a). *The Original Game Changers: An Evaluative Report on Prince Albert's Centre of Responsibility and its Role in the Advancement of Community Mobilization Efforts to Improve Community Safety and Wellness*. Saskatoon, SK: Centre for Forensic Behavioural Science and Justice Studies – University of Saskatchewan.

Nilson, C. (2015b). *Measuring Change: A Framework to Support Evaluation of Collaborative Risk-Driven Community Safety and Well-Being in Ontario*. Delivered to the Ontario Working Group on Collaborative Risk-Driven Community Safety. Prince Albert, SK: Living Skies Centre for Social Inquiry.

Nilson, C. (2016a). *Collaborative Risk-Driven Intervention: A Study of Samson Cree Nation's Application of the Hub Model*. Ottawa, ON: Public Safety Canada.

Nilson, C. (2016b). *Evaluation Framework: Creating a Pathway for Performance Monitoring and Outcome Measurements of Collaborate Barrie*. Toronto, ON: Global Network for Community Safety.

Nilson, C. (2016c). *Chatham-Kent's Fast Intervention Risk Specific Team: An Evaluation Plan*. Toronto, ON: Global Network for Community Safety.

Nilson, C. (2016d). *Privacy and Information Sharing in Muskoday Intervention Circle*. Prince Albert, SK: Living Skies Centre for Social Inquiry.

Nilson, C. (2016e). *Muskoday Intervention Circle: Summary*. Prince Albert, SK: Living Skies Centre for Social Inquiry.

Nilson, C. and Taylor, N. (2016). *Moving Forward Collaboratively: A Strategic Overview of Opportunities to Maximize the Combined Leverage of Ottawa's Community Safety and Well-Being Initiatives.* Toronto, ON: Global Network for Community Safety.

Nilson, C., and Okanik, K. (2015). *Home-Based Family Programming in Northern and Aboriginal Communities: A Literature Review in Support of Programming Development for Families Exposed to Violence*. Prince Albert, SK: Living Skies Centre for Social Inquiry.

Nilson, C., Winterberger, M., and Young, T. (2015a). *Hub Chair Discussion Guide: A Tool Designed to Help Hub Chairs Run Data-Friendly Hub Discussions.* Prince Albert, SK: Community Mobilization Prince Albert/ Centre for Forensic Behavioural Science and Justice Studies – University of Saskatchewan.

Nilson, C., Winterberger, M., and Young, T. (2015b). *Hub Discussant Guide: A Tool Designed to Help Hub Discussants Run Data-Friendly Hub Discussions.* Prince Albert, SK: Community Mobilization Prince Albert/ Centre for Forensic Behavioural Science and Justice Studies – University of Saskatchewan.

North Bay Parry Sound District Health Unit. (2014). *North Bay Gateway Hub: Evaluation Matrix.* North Bay, ON: North Bay Parry Sound District Health Unit.

O'Donnell, S., Johnson,L., Kakepetum-Schultz, T., Burton, K., Whiteduck, T., Mason, R., Beaton, B., McMahon, R., and Gibson, K. (2013). Videoconferencing for First Nations Community-Controlled Education, Health and Development. In *The Electronic Journal of Communication*, v.23, n.1.

Okanik, K., and Nilson, C. (2016). *Collaborative Risk-Driven Intervention and Multi-Agency Coordinated Support: Literature, Theory and Practice.* Prince Albert, SK: Living Skies Centre for Social Inquiry.

Papachristos, A., Meares, T., and Fagan, J. (2007). Attention Felons: Evaluating Project Safe Neighbourhoods in Chicago. In *Journal of Empirical Legal Studies*, v. 4:223-272.

Pelgrum, W. (2001). Obstacles to the Integration of ICT in Education: Results from a Worldwide Educational Assessment. In *Computers & Education*, v.37, i.2:163-178.

Petelen, J., Nelson, M., and Goodman, J. (2007). *Deployment and Early Experience with Remote-Presence Patient Care in a Community Hospital.* In Surgical Endoscopy, v.21:53-56.

Primary Health Care. (2014). Robotics Technology Increases Access for Patients in Northern Saskatchewan. In *Success Stories from Saskatchewan's New Framework for Primary Healthcare*. Regina, SK: Saskatchewan Ministry of Health.

Reese, R., Conoley, C., and Brossart, D. (2006). The Attractiveness of Telephone Counselling: An Empirical Investigation of Client Perceptions. In *Journal of Counselling & Development*, v.84:54-60.

Rehman, S. and Khilji, N. (2014). Fast Pace of Change in ICTs (Information & Communication Technologies) and Knowledge Workers' Training Issues. In *Asian Journal of Business and Management*, v.2, n.5:454-460.

Reynolds, E., Grujovski, A., Wright, T., Foster, M., and Reynolds, N. (2012). Utilization of Robotic "Remote Presence" Technology Within North American Intensive Care Units. In *Telemedicine and e-Health, v.18, n.7: 507-515.*

Rincon, F., Vibbert, M., Childs, V., Fry, R., Caliguri, D., Urtecho, J., Rosenwasser, R., and Jallo, J. (2012). Implementation of a Model of Robotic Tele-Presence (RTP) in the Neuro-ICU: Effect on Critical Care Nursing Team Satisfaction. In *Neurocrit Care*, v.17:97-101.

Ritter, C., Teller, J., Munetz, M., and Bonfine, N. (2010). Crisis Intervention Team (CIT) Training: Selection effects and lon-term changes in perceptions of mental illness and community preparedness. In *Journal of Police Crisis Negotiations*, v.10: 133-152.

Roberts, J. (2013). *Police Apps for Law Enforcement Officers & Future Crime Fighters*. Retrieved from www.rasmussen.edu.

Rouse, M. (2005). *ICT (Information Communications Technology)*. Retrieved from www.techtarget.com.

Rouse, M. (2008). *Teleconference*. Retrieved from www.techtarget.com.

Russell, H., and Taylor, N. (2014a). *New Directions in Community Safety-Consolidating Lessons Learned about Risk and Collaboration: An Interpretive Guide to Information Sharing Practices in Ontario…Within the Context of Collaborative, Risk-driven Community Safety and Well-being*. Ontario Working Group on Collaborative Risk-Driven Community Safety.

Russell, H., and Taylor, N. (2014b). *New Directions in Community Safety-Consolidating Lessons Learned about Risk and Collaboration*. Ontario Working Group on Collaborative Risk-Driven Community Safety.

Russell, H., and Taylor, N. (2014c). *New Directions in Community Safety-Consolidating Lessons Learned about Risk and Collaboration: Mitigating Acutely-Elevated Risk of Harm Considerations in Adopting "The Situation Table".* Ontario Working Group on Collaborative Risk-Driven Community Safety.

Russell, H., and Taylor, N. (2015). Gaining Momentum: Multi-Sector Community Safety and Well-Being in Ontario. Report Prepared for the Ontario Working Group on Collaborative Risk-Driven Community Safety and Well-being. Ottawa, ON: Ontario Association of Chiefs of Police.

Schectman, T. (2011). *Augmentative and Alternative Communication*. Retrieved from www.friendshipcircle.org.

Seeley, M. (1996). Hotlines as Discrete Services in Mental Health and Human Service Organizations. In *Crisis*, v.17:100-101&104.

Selwin, N., Gorad, S., and Furlong, J. (2006). *Adult Learning in the Digital Age: Information Technology and the Learning Society.* Abingdon, UK: Routledge, Taylor and Francis Group.

Silva, C. (ed.), (2010). Introduction. In Silva, C. (ed.)., *Handbook of Research on E-Planning: ICTs for Urban Development and Monitoring*, pp.xx-xxiv. Hershey, PA: Information Science Reference.

Skubby, D., Bonfine, N., Novisky, M., Munetz, M. R., & Ritter, C. (2013). Crisis Intervention Team (CIT) Programs in Rural Communities: A Focus Group Study. *Community Mental Health Journal*, Vol, 49: 756–764.

Smallman, G. (2012). *The Benefit of Apps in Healthcare: Mobile and Tablet Apps Have Enormous Potential for Training and Professional Development in Healthcare.* Retrieved from www.theguardian.com/healthcare-network.

Snelling, S. (2014). *Process/Implementation Evaluation Interview Guide: Evaluator Version*. Sudbury, ON: Community Mobilization Sudbury.

SPPS Enterprise Group. (2011). *Global Literature and Experience in Whole-of-Government Approaches to Crime and Violence Reduction: An Interpretive Report on the Development and Meta-Analysis of an Annotated Bibliographic Database for Provincial Policy Makers*. Development for the Saskatchewan Police and Partners Strategy. Regina, SK: Government of Saskatchewan.

Stead, L., Hatmann-Boyce, J., Perera, R. and Lancaster, T. (2013). Telephone Counselling for Smoking Cessation. In *Cochrane Database of Systemic Reviews*, i.8.

Stefancic, A., Henwood, B., Melton, H., Shin, S., Lawrence-Gomez, R., and Tsemberis, S. (2013). Implementing Housing First in Rural Areas: Pathways Vermont. In *American Journal of Public Health*, v.103, supp.2:S206-S209.

Suitabletech. (2016). *What is Beam Smart Presence?* Retrieved from www.suitabletech.com.

Tachakra, S., Wang, X., Istepanian, R., and Song, Y. (2004). Mobile e-Health: The Unwired Evolution of Telemedicine. In *Telemedicine Journal and e-Health*, v.9, n.3:247-257.

Taylor, N. (2010). *Consultant's Report: A Province-Wide Policing Strategy to Reduce Crime, Build Safe Communities and Secure the Future for Saskatchewan*. Delivered to the Saskatchewan Ministry of Corrections, Public Safety and Policing. Regina, SK: Government of Saskatchewan.

Taylor, N. (2011). Game Changers: Prince Albert Partners Redefine the Fight Against Crime. In *Police Chief Magazine,* spring/summer, pp.20-27.

Techtarget. (2007). *What is a Videoconference?* Retreived from www.techtarget.com.

Teller, J., Munetz, M., Gil, K., and Ritter, C. (2006). Crisis Intervention Team Training for Police Officers Responding to Mental Disturbance Calls. In *Psychiatric Services*, v.57, n.2: 232-237.

Trucano, M. (2005). *Knowledge Maps: ICTs in Education*. Washington, DC: infoDev – World Bank.

Tutty, L., LeDrew, S., and Paige, A. (2008). *The Evaluation of Saskatchewan's Children Exposed to Domestic Abuse Programs: Final Report*. Calgary, AB: RESOLVE Alberta.

UNESCO. (2016). *ICT in Education*. Retrieved from en.unesco.org/themes/ict-education.

Unhelkar, B. (2011). *Handbook of Research on Green ICT: Technology, Business and Social Perspectives*. Hershey, PA: Information Science Reference.

Waegemakers-Schiff, J., and Turner, A. (2015). *Housing First in Rural Canada: Rural Homelessness and Housing First Feasibility Across 22 Canadian Communities.* Calgary, AB: University of Calgary.

Wald, H., Dube, C., and Anthony, D. (2007). Untangling the Web — The Impact of Internet Use on Health Care and the Physician-Patient Relationship. In *Patient Education and Counselling*, v.68, i.3:218-224.

Wang, F., Carley, K., Zeng, D,., and Mao, W. (2007). Social Computing: From Social Informatics to Social Intelligence. In *IEEE Intelligence Systems*, v.22, i.2:79-83.

Watson, A., Morabito, M., Draine, J., and Ottati, V. (2008). Improving Police Response to Persons with Mental Illness: A Multi-Level Conceptualization of CIT. In *International Journal of Law and Psychiatry*, v.31: 359-368.

WHO. (2016). Information and Communication Technologies for Public Health Emergency Management. Retrieved from www.who.int.

Wyllie, D. (2011). *You've got NERV: Emergency Interoperability on Wheels.* Retrieved from www.policeone.com.

Zuppo, C. (2012). Defining ICT in a Boundaryless World: The Development of a Working Hierarchy. In *International Journal of Managing Information Technology* (IJMIT), v.4, n.3: 13-22.