



Evaluation of the Keewatinook Okimakanak Telepsychiatry Pilot Project

21 December 2002



**Centre for Health Services
and Policy Research**

**Keewaytinook Okimakanak
First Nations Council**

**Evaluation of the
Keewaytinook Okimakanak
Telepsychiatry Pilot Project**

Co-Principal Investigators:

Christian Keresztes, PhD, CPsych
Ralph Shaw, MA

Co-Authors:

Christian Keresztes, PhD, CPsych
Ralph Shaw, MA
Dorota Raciborska, MA
Joyce Timpson, PhD
Orpah McKenzie, HBScN, RN
Mary Ellen Johnson, BA, MSW, RSW
Luke Rae
Fabian Campbell
Alice Suggashie
Teresa Wassaykeesic

21 December 2002

**Centre for Health Services and Policy Research
Queen's University**

Contact Information:

Centre for Health Services and Policy Research

Abramsky Hall, 3rd Flr.
Queen's University
Kingston ON K7L 3N6
CANADA

CHSPR: 1 613 533-6387
FAX: 1 613 533-6353
eMail: chspr@post.queensu.ca
Web: <http://chspr.queensu.ca/default.htm>

Keewaytinook Okimakanak

Administration Office:

Fort Severn First Nation
General Delivery
Fort Severn ON POV 1W0
CANADA

Sub-Office:

127 Mine Road
P.O. Box 340
Balmertown ON POV 1C0
CANADA

Telephone: 1 807 735-1381
General Office FAX: 1 807 735-1383
Public Works FAX: 1 807 735-1385
Web: <http://www.knet.ca/info.html>

Table of Contents

Executive Summary	i
1.0 Introduction	1
2.0 Keewaytinook Okimakanak - Geography, History and Culture	5
3.0 The Keewaytinook Okimakanak Telepsychiatry Pilot Project	17
4.0 Evaluation Plan	23
5.0 Findings : Cost-Effectiveness	33
6.0 Findings : Clinical Service	51
7.0 Conclusions	63
8.0 Recommendations	71
Appendices	75
Appendix A : Letter of Invitation	77
Appendix B : Telepsychiatry Project Questionnaire	79
Appendix C (i) : Client Follow-up Survey - Poplar Hill	81
Appendix C (ii) : Client Follow-up Survey - North Spirit Lake	83
Appendix D : Consent to Participate Form	85
Appendix E : Oath of Confidentiality Form	87
Appendix F : Information Regarding the Study (for Clients)	89
Appendix G : Research Consent Form	91
Appendix H : Information Regarding the Study (for Healthcare Providers and Community Members)	95
Appendix I (i) : Chronology and Cost of Mental Health Service Provision: Service to Remote Communities without Telepsychiatry	97
Appendix I (ii) : Chronology and Cost of Mental Health Service Provision Service to Remote Communities - Telepsychiatry Pilot Project	99
Appendix I (iii) : Chronology and Cost of Mental Health Service Provision Service to Remote Communities - On-Going Telepsychiatry Programme	103
References	105

EXECUTIVE SUMMARY

During the period from April, 2000, through March, 2001, the Keewaytinook Okimakanak First Nations Tribal Council from Northern Ontario undertook a pilot project to provide telepsychiatry services to two of its six communities. The purpose of the pilot project and its evaluation was to assess the long-term viability of telepsychiatry as an ongoing program for First Nations communities. The evaluation undertook to assess the costs of providing the service to each of the primary stakeholders, as well as its effects on access to mental health care, the clinical process of care, health outcomes, and user satisfaction.

Keewaytinook Okimakanak First Nations Council

Keewaytinook Okimakanak, or 'Northern Chiefs' in Oji-Cree, is a non-political administrative council serving six First Nations communities in northwestern Ontario. These communities, which range in population from 250 to 900 and, together, form a population of about 2,800 people, have pooled their resources in Keewaytinook Okimakanak to finance, co-ordinate and administer a series of comprehensive programs and services, including health care.

The Keewaytinook Okimakanak Telepsychiatry Pilot Project

Heretofore, individual and family counselling, and psychiatric care for all First Nations clientele in the Sioux Lookout Zone have been provided through Nodin, a federally funded counselling centre, located in Sioux Lookout. Nodin's psychiatric services are supplied by a group of specialists who rotate-through on a (roughly) 6-week periodic cycle, serving the community for a week at a time (i.e., one 5-day week period, eight to ten times a year). In total, this amounts to about 57 days of direct psychiatric care, or less than one-quarter of a full-time psychiatrist per year for a Zone population that would justify two full-time positions.

The recent increase in the demand for mental health care among remote northern First Nations communities has overwhelmed existing services to the extent that long waiting periods must be endured before counselling can be provided. A telepsychiatry program was conceived as a means to overcome the economic and geographic barriers to accessing mental health care imposed upon rural and remote First Nations communities. Its purpose was to supplement existing mental health services and thereby reduce the long periods spent awaiting care. The pilot project was undertaken to test the viability of such a program. Video, telecommunication and digital information technologies were combined to create live-time audio-visual links between First Nations clientele within their home communities

and a psychiatrist in Winnipeg, Manitoba. During 1½-hour videoconferencing sessions, the psychiatrist provided assessment, treatment and consultation services.

The Project Evaluation ~ Conclusions

Cost Effectiveness

The cost of providing and receiving mental health services has two primary components. While it is important to understand how much such services cost, it is equally important to appreciate who pays for it.

Providing Mental Health Care Services to Remote First Nations Communities without Telepsychiatry

- ! Currently, to receive psychiatric care, clients and their escorts must use local air transportation to travel an average 300 kilometres from their isolated communities to the Nodin counselling centre in Sioux Lookout.
- ! A time commitment of at least 36 hours on the part of both the client and an escort is required for the client to receive a 1-hour psychiatric counselling session.
- ! The total cost of this care is estimated to average \$2,716 per client-session, which includes the cost of the referral assessment, travel and accommodation, the service itself, and those costs borne by the client's home community.
- ! This does not take into account any additional costs incurred by the client or escort, such as foregone wages or the cost of alternative care for dependants left at home.

Using Telepsychiatry to Bring Mental Health Care Services to Remote First Nations Communities

- ! A 1½-hour telepsychiatry session, conducted within a client's home community, would require a time commitment of no more than 2 hours from the client. And there would be no requirement for an escort.
- ! It is estimated that the total cost would average about \$710 per client-session. This would include the cost of the referral assessment, the psychiatrist's professional fees, the depreciation of the videoconferencing suite at that end, a pro-rated depreciation of the community's videoconferencing equipment, and an appropriate share of the telecom line charges.

While considerable savings would accrue through the implementation of a telepsychiatry program, there would also be significant transfers of economic burden within the overall system:

- Savings of \$2,148 per client-session, in the form of travel and accommodation no longer required by the client and escort, would be realized by Health Canada - FNIHB (NIHB);
- The cost to SLFNHA Client Services would increase about \$7 per client-session, i.e., not significantly;
- However, the client's home community could expect its share of the overall cost to increase, from about \$170 to between \$305 and \$580 per client-session, depending upon whether service organizers determined whether the services of a Mental Health Consultant would continue to be required, or that much of this work could be undertaken by a community's Mental Health Worker. It is also possible that, in either case, a considerable portion of this direct cost might be offset by the re-allocation of already budgeted resources.

Clinical Service

Along with interviews with the psychiatrist and community care providers, the evaluation of the clinical service included a chart audit, as well as post-sessional and 6-month follow-up surveys with clients.

The Keewatinook Okimakanak Telepsychiatry Pilot Project

- ! In total, 25 clients met with the psychiatrist via videoconferencing, for a total of 40 sessions. The most common presenting problems were suicidal ideation, complicated grief, substance abuse, depression and anxiety.
- ! The service responded to significant mental health problems in the community, and was used by people in need who would otherwise have had little or no access to specialized mental health assessment and treatment.
- ! Clients demonstrated perfect attendance and expressed consistently positive perceptions of the confidentiality and benefits of the service which were maintained over time.
- ! In contrast to western cultural expectations, the distance created by not being face-to-face with the psychiatrist appears to have helped clients feel comfortable with the psychiatrist.

- ! While many clients (60%) indicated they felt nervous during their session, most (80%) said they felt comfortable with the psychiatrist asking personal questions of them.
- ! Almost all the clients indicated that the psychiatrist had helped them with their emotional problems, and that they would recommend the service to people they care about who have emotional problems.
- ! Both clients and health care providers liked the increased availability of mental health services in the community, without a requirement for travel.
- ! Both clients and local health care providers liked the service and wanted more of it.
- ! Health care professionals and paraprofessionals reported increased continuity and coordination of care for clients and increased flexibility in their work.
- ! Front-line workers in the communities reported reduced isolation and increased support in their work.
- ! Extensive community orientation to the service, (including: mass distribution of information brochures, community radio information programs and a community visit by the consultant) contributed to the successful introduction of the service. The opportunity to meet the consultant in the community helped clients become comfortable with the service.
- ! The pilot project was successful, in part, because its organization and delivery responded to local needs and used a personal approach. In this, the skill and experience of staff contributed significantly to the success of the project.
- ! Service providers pointed to the potential for telepsychiatry to increase continuity and follow-up in service; to deliver more specialized services (e.g., for children and adolescents); to foster more networking among community health workers and professionals; and to allow for more flexibility in the local management of services.
- ! A significant unanticipated consequence of the pilot project was a sense of hope among clients and service providers.
- ! Local control of new technology such as videoconferencing may well support traditional communities in preserving their culture and heritage.

Recommendations

Conclusions drawn from the evaluation have led to the following recommendations:

Cost Effectiveness

- 1) **Undertake an on-going telepsychiatry programme with caution.** While there are significant economies to be gained, overall, an on-going program of telepsychiatry care would also induce significant transfers of economic burden across stakeholders within the First Nations mental health care system; most notably, from Health Canada FNIHB (NIHB) to Keewaytinook Okimakanak First Nations communities. However, in the final analysis, without a more accessible cost-effective and time-efficient mental health care system, it is the current and future First Nations clientele who will pay the greatest cost.
- 2) **Enter into negotiations with Health Canada - FNIHB, perhaps through Program Policy, Transfer Secretariat and Planning (Health Funding Arrangements Division) to access a portion of the savings** that will accrue to the Non-Insured Health Benefits division as a result of an on-going telepsychiatry programme.
- 3) **Seek-out new funding sources to support the purchase of capital equipment requirements.** From the point of view of the First Nations communities, external resources not forthcoming, it would be difficult to justify a telepsychiatric programme, as described, as more economically feasible than existing modes of delivery. (It is the individuals and communities involved who must place a value on the time and out-of-pocket commitments required of clients and escorts.)
- 4) **Draw upon the expertise and broad-based capabilities of K-Net Services staff** in the design, development and acquisition of telepsychiatry computing and teleconferencing equipment.
- 5) **Broaden the use of videoconferencing equipment to include other telehealth and community-based programs** as a means to fold-in services and share costs among other community videoconferencing users.

Clinical Service

- 1) **Increase the range of mental health services for children available through videoconferencing.** Health care professionals and paraprofessionals identified a need to increase access to specialized mental health services for children.

- 2) **Expand the use of the telepsychiatry service for support and training of community mental health workers.** Expanded service to more communities should include more opportunities for networking and continuing education.
- 3) **Broaden the scope of tele-mental health services and the selection of service providers to include social workers, family counsellors, psychologists, spiritual counsellors and traditional healers, and others** who can be drawn upon from across the region and the province to address mental health problems in remote First Nations communities.

A Final Comment

What has been described amounts to a new mode of delivering mental health services to remote northern First Nations communities. The results seem very positive. Despite some unforeseen obstacles, a high degree of service effectiveness and cost efficiency was attained. Still, it must be clearly understood: telepsychiatry is not an alternative to face-to-face psychiatric care, although, it does provide an economical, clinically effective means to bring mental health counselling to clients in geographically remote locations.

Logically, it would make sense for Keewaytinook Okimakanak Tribal Council to partner with Nodin, and/or others, to expand the psychiatric services now offered. This presents the possibility of expanding service to include other forms of tele-counselling and telehealth. Laying the groundwork to support this enhanced service will involve re-organising mental health services in the region to accommodate the technology, as well as a period of adaptation for practitioners to appreciate its subtleties.

It will also require the commissioning of new funding streams to permit the establishment and expansion of this service. And, not least, it will require significant effort on the part of legislators to create the appropriate governance and regulatory environments to encourage such a service to flourish.

1.0 Introduction

1.1 Purpose and Requirements of this Evaluation

Following preliminary discussions during the summer of 2001, the Health Director for the Keewaytinook Okimakanak First Nations Council in Red Lake (Balmertown), Ontario, retained the Queen's Centre for Health Services and Policy Research at Queen's University in Kingston, Ontario, to plan and conduct an evaluation of a pilot telepsychiatry service that had operated from April, 2000, through March, 2001. A copy of the letter of invitation appears in Appendix A.

The purpose of the evaluation was to assess the implementation and the results of the pilot project that may support:

- 1) The future planning, implementation, operation and development of tele-mental health services for remote northern communities;
- 2) A request to continue funding for the service.

The deliverables for which Keewaytinook Okimakanak First Nations Council contracted included:

- 1) An evaluation plan;
- 2) A technical evaluation report;
- 3) An evaluation report to the communities.

The evaluation was based on data collected by health service providers while the telepsychiatry service was in operation, and on data gathered, primarily, from interviews conducted during a site visit in early September, 2001.

1.2 Evaluating Telehealth

Program evaluation is the systematic collection and analysis of information about the activities, characteristics, and outcomes of programs. Generally, it is used to make judgments about programs, to improve their effectiveness and the accountability within their organization, and to inform decisions about future programming.¹

In the evaluation of telehealth, the entity to be assessed is the model of service delivery, rather than the nature of the clinical service being delivered.² Thus, evaluation is directed at assessing the effects of using a telehealth model of health care delivery, and the relative effectiveness of the telehealth model of care delivery in comparison to other models of delivery.

The planning of telehealth follows a cycle that begins with an assessment, followed by definition, design, implementation, support and evolution, which are followed by reassessment, redefinition, and so forth.³ The cycle is iterative and ongoing, as the service, its process, technology, organization and management move from adoption to implementation and eventual routinization. Thus, the evaluation of telehealth should also be cyclical and ongoing.

Specifically, an evaluation should:

- be an integral part of service design and redesign for quality improvement;
- be a systematic, cumulative and forward-looking process for building knowledge useful to decision makers;
- compare the benefits and costs of telemedicine with those of comparable current practices;
- identify practical and economical ways to implement and achieve the results desired.

In the present evaluation, an additional factor for consideration - but not directly an object of evaluation - is the appropriateness of psychiatric services for First Nations clients and the unique aspects of their communities, culture and beliefs.

1.3 The Keewatinook Okimakanak Telepsychiatry Pilot Project

From April, 2000, through March, 2001, the Health directorate of Keewatinook Okimakanak undertook a pilot project to provide telepsychiatry service to clients in the First Nations of Poplar Hill and (for the last three months) North Spirit Lake. Videoconferencing equipment was used to link clients from the participating First Nations with a psychiatrist in Winnipeg, Manitoba.

Heretofore, medical and psychiatric, as well as individual and family counseling services, have been provided through the Nodin Counseling Service Centre and the Sioux Lookout Zone Hospital, both federally funded institutions established to serve First Nations clients in Northwestern Ontario. The telepsychiatry program was initiated to alleviate the long periods spent awaiting service by clients due to the high levels of service being demanded of Nodin and The Zone Hospital. Rather than replace services provided at Nodin and The Zone, the program was conceived as a means to supplement existing, but difficult to access, mental health care services for these communities.

1.4 The Economic Rationale behind the Telepsychiatry Program

Health care in the province's northwest is primarily the responsibility of the Government of Ontario. However, since the people of the Keewatinook Okimakanak are First Nations, the responsibility for their health care is a federal mandate. As a result, services provided are funded through the First Nations and Inuit Health Branch (FNIHB), of Health Canada. Thus, the responsibility for diagnostic and treatment services, mental health care, rehabilitation, vital statistics, hospitals & hospital boards, physicians & nurses, and insured services, which are otherwise provincial responsibilities, fall to the federal government in this instance. These are in addition to the existing federal responsibilities of public health, and its promotion and protection, environmental protection and other non-insured services for all Canadians.

With respect to this particular project, the necessary authority and responsibility to permit the telepsychiatric services that were provided to continue as an ongoing program do not fall to any single institution or organization. In order to transform the pilot project into a successful telepsychiatric program to serve the Keewatinook Okimakanak First Nations communities, the Tribal Council will need to harness the funding resources available from whichever budget envelopes are the most appropriate and/or available. To further this aim, it will be necessary to understand the process by which mental health services have been provided to clients from the Keewatinook Okimakanak First Nations, historically, and how a telepsychiatric service might be developed as an effective and cost-efficient method to provide some of this care.

1.5 Presentation and Format of the Evaluation Report

An evaluation of any telehealth network should address several aspects of the service: social context, economic effectiveness and clinical impact. To fully grasp the character and impact of the Keewatinook Okimakanak Telepsychiatry Pilot Project it will also be necessary to understand the socio-economic environment in which it was created, both macro and micro.

This report is divided into seven sections, a set of appendices and a bibliography of the relevant readings. Section 1 of this report has introduced the purpose of the pilot project and the broad framework and form of the evaluation.

With a brief description of Keewatinook Okimakanak and the Nishnawbe-aski-Nation, and an overview of healthcare and mental services issues in the north, Section 2 provides context to the evaluation and will (we trust) assist the lay reader to interpret the findings, discussion, conclusions and recommendations, which follow. Section 3 undertakes to describe the

Keewaytinook Okimakanak Telepsychiatry Project and the driving needs, rationale and goals which drew people to create the telepsychiatry network

Section 4 broadly describes the two approaches used in the evaluation and specifies the questions asked to assess the pilot project.

Section 5 is a report of the cost- effectiveness analysis, describing how psychiatric service is currently being provided, how it is was provided through the telepsychiatric project, and how it might be provided through an on-going telepsychiatric programme. It addresses the impact of each on the overall healthcare resources available, including the size of their budget envelopes, expected transfers of economic burden, and relative fiscal sustainability.

Section 6 presents an analysis of the clinical service provided through the project, including an assessment of clinical outcomes resulting from the service and the clinical impact on the overall regime of mental health care of those clients who received a psychiatric consultation through the medium of video telecommunication.

Section 7 lays out the conclusions drawn from the analysis, and a set of recommendations drawn from the conclusions is presented in Section 8. Supporting documentation appears in a series of appendices to complete the report.

2.0 Keewaytinook Okimakanak - Geography, History and Culture

2.1 The Nishnawbe-aski Nation

Keewaytinook Okimakanak is part of the Nishnawbe-aski Nation (NAN), a much larger First Nations political organization mandated to represent its member communities to federal and provincial governments. The Nishnawbe, the people of NAN, are Cree and Ojibway, and share the common language of “Oji-Cree”. Among the Nishnawbe, English is often learned as a second language.

The NAN territory (note: Map 1) covers about two-thirds of the Province of Ontario’s geographic area, stretching across the north about seven hundred miles in length and four hundred miles in width; from the Manitoba border on the west to the Quebec border on the east, from the Hudson’s and James Bay watersheds in the north to roughly the Canadian National Railway line in the south.⁴ The Treaty area includes the districts of Cochrane, Timiskaming, Sudbury, Algoma, Thunder Bay and Sioux Lookout.

It is estimated that 25,000 Nishnawbe live in 49 communities scattered throughout this area. The majority are isolated and do not enjoy year round road access. Generally, they are accessible only by small aircraft, although, for some, temporary roads do permit the over-land transportation of goods in winter. However, long winters and temperatures as low as minus 60 degrees Celsius, making this form of travel arduous and unreliable at the best of time.



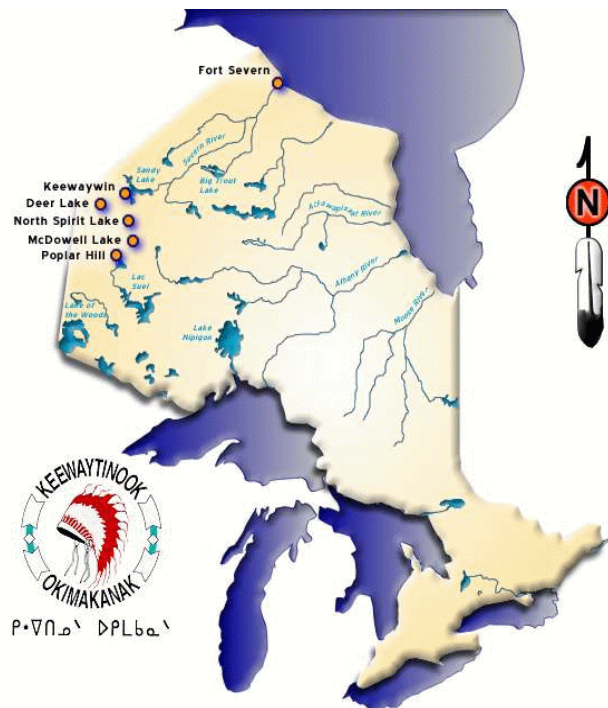
Traditionally, the Nishnawbe lived in small extended family groups, moving camp according to the season and the movement of the wildlife on which they depended. From the late 17th century onward, contact with Europeans grew slowly to a point, just after World War II, when government began to organize the introduction of educational and municipal services. Children were taken away to regional residential schools, and people were pressured to move into permanent settlements where centralized services could be provided. Only one generation ago, large numbers of families still supported themselves through trapping and some social assistance, supplementing their food supplies with hunting and fishing. Most people lived in simple houses, with no indoor plumbing, electricity or telephones.

The introduction of infrastructure and services began in earnest during the 1980s and 1990s, such that most communities now have modern amenities and ready access to the most modern computer and information technology available. Well equipped community health clinics are now permanently staffed by specially trained nurses, and physicians make monthly visits. In little more than a generation, people have changed from living a traditional, land-based subsistence to a life centered in permanent settlements with access to the outside world through modern analog and digital communication technology. Yet, despite these changes, many have been able to retain their language and culture.

2.2 Keewaytinook Okimakanak First Nations Council

Keewaytinook Okimakanak, which means Northern Chiefs in Oji-Cree, is a non-political, administrative council within, yet independent of the NAN, serving six northwestern Ontario First Nations communities: Deer Lake, Fort Severn, Keewaywin, McDowell Lake, North Spirit Lake and Poplar Hill, (note: Map 2) which range in population from 250 to 900 and, together, form a population of about 2,800 people.

These communities have pooled their resources in Keewaytinook Okimakanak so as to better finance, co-ordinate and administer a series of comprehensive programs and services among themselves, which include health, economic development,



Source: Keewaytinook Okimakanak K-Net

employment, education and public works. As well, the council has developed and continues to maintain K-Net Services, a computer communications provider located in Sioux Lookout which maintains a world wide web presence for Keewaytinook Okimakanak and its member nations.

2.3 Health Care and Mental Health Services in the North

Prior to contact with Europeans, the Oji-Cree are believed to have enjoyed good health, treating physical and psychological disorders through spiritual and herbal methods. Increased contact with western cultures brought exposure to many new diseases, in combination with declining game resources and created increased reliance on Western medicine and services. Eventually, medical care for First Nations became the responsibility of the federal government. While health professionals made sporadic visits to First Nations communities, more usually those requiring medical care needed to be transported a considerable distance to the First Nations Zone hospital located in Sioux Lookout.⁵

In 1970, the federal government entered into an agreement with the University of Toronto's Faculty of Medicine to provide medical services to the Sioux Lookout Zone Hospital and the communities it served. The university recruited staff to provide visiting specialist services, one of which was psychiatry. Mental health workers who counselled First Nations clients received long distance support from the Toronto psychiatrists by telephone.⁶ Recognizing the limitations of western psychiatry in this setting, program participants developed a consultation-liaison model in which they worked closely with on-site caregivers such as nurses, physicians and lay health aides.^{7, 8}

At that time, basic telepsychiatry and telemedicine were being delivered in remote Northwestern Ontario. The Sioux Lookout Zone Hospital was one of the first sites to demonstrate the reliability of telemedicine diagnosis.^{6, 9} Toronto's Sunnybrook and Sick Childrens Hospitals were linked to the Zone Hospital and to six remote communities via standard telephone lines. The system was equipped for consultations in radiology, cardiology, and dermatology, and was used more than 600 times for consultations and staff education.

The model for psychiatric care lent itself, well, towards the evolving technology of telemedicine. In 1981, after a successful demonstration project to model the use of indigenous para-professionals, the university decided to reduce the number of visits by psychiatric specialists and employed a professional social worker to train two lay indigenous persons to provide supportive counseling. Clients could now receive counseling in their own language from workers from their culture. The role of the psychiatrists became largely that of a consultative teacher for these workers. The psychiatrists travelled with the counsellors

to the communities where they worked as a team with their clients and, later, maintained contact with the program by telephone.¹⁰

The program was the precursor to the Nodin Counseling Services Centre, which now operates with a staff of 20 under the auspices of the Sioux Lookout First Nations Health Authority (SLFNHA), as part of the medical services contracted by the Sioux Lookout Zone Hospital with the University of Toronto medical community. In 1994, the administration of Nodin was transferred directly to the SLFNHA, which subsequently negotiated a new health services agreement with the University of Toronto. Nodin currently provides four basic services: acute care, community crisis support, community development and training, and consultant psychiatric services, which is provided by specialists under the current contract with the University of Toronto.

2.4 Suicide - A New and Disturbing Problem

Little information about the extent of mental illness in Aboriginal communities exists, however, studies suggest alarmingly high rates of depression and adjustment reactions. Some studies suggest that up to 60% of First Nations patients visiting urban health clinics present complaints caused by mental health problems. Furthermore, these patients are highly unlikely to return after the initial visit.¹¹ First Nations youth, who make up 33% of the total aboriginal population¹², are committing suicide at extremely high rates compared to the overall Canadian population; eight times higher for First Nations females, and five times higher for First Nations males. These statistics have raised concerns about the lack of appropriate assessment and treatment techniques for First Nations populations.¹³

Historically, the suicide rate among the Nishnawbe was lower than both the Canadian average and that of other First Nations. However, by 1987, suicides became epidemic in the area. The annual number of suicides rose from one or two per year in the early 1980s to eight in 1987, twenty-three in 1993, reaching an all time high of twenty-five in 2000. The fifteen-year rate for some communities is as high as 400 per 100,000 compared to the national average of 12 per 100,000. Parasuicidal behaviour, namely attempts and gestures, became so widespread as to be termed as “endemic” in some communities.¹⁴

The suicide crisis has overwhelmed mental health services. Communities unable to cope often send those in crisis to outside services, usually to Nodin’s centralized counseling and referral service. Nodin now services mainly those deemed at highest risk for suicide. The rotation of visiting psychiatrists is currently about twelve visits per year, for an annual total of sixty-seven days of direct psychiatric care. This amounts to one quarter of a full-time position for a population warranting the care of at least two full-time psychiatrists. Furthermore, the psychiatrists visiting on rotation tend, most frequently, to serve the 26 to

40-year age group, rather than those in the 15 to 25-year age group, who exhibit the highest risk for suicide.

2.5 A New Approach to Delivering Mental Health Care

The history of service provision in the north has been one of adapting to the geographical and cultural differences that are always present, and to changing social and economic conditions as they arise. There continue to be numerous challenges to providing effective mental health services in the north:

- Physical barriers of distance and terrain and the associated costs of overcoming them;
- Long waits for psychiatric appointments;
- and when appointments are taken, the short duration of consultations;
- Difficulties in providing continuity in care from one psychiatrist to another between consults;
- Inability to involve whole families in treatment programs;
- Cross-jurisdictional legal constraints to engaging other health care providers in mental health care giving;
- Inability to reach the highest risk groups.

The rapid evolution of videoconferencing technology and its widespread adoption elsewhere has led to a consideration of its use for the delivery of mental health services to remote northern communities.

2.6 Telepsychiatry and First Nations Mental Health Care - A Review of the Literature

A review of the research literature was conducted to answer pertinent questions about the character and use of telepsychiatry.

2.6.1 What is telepsychiatry?

Telemedicine involves the use of telecommunications technology for the delivery of health care to remote locations, and for other purposes such as staff training, administration, education, and patient support.¹⁵ Telepsychiatry is the application of telemedicine in the field of mental health. It typically involves live transmission over a two-way videoconferencing link, using digitally compressed video and audio signals. It is one of the most common applications in telemedicine.¹⁶

Telepsychiatry permits a wide range of activities related to mental health care under circumstances where geography or cost would otherwise severely restrict access to these much-needed services.¹⁷ Videoconferencing for psychiatry, and telemedicine in general, are considered potential solutions to specialist care shortages experienced by regions with vast, sparsely populated areas to which road access is limited or non-existent. In addition, telepsychiatry links to hospitals and large urban centres are perceived by remote rural communities as one means to overcoming social and economic isolation, as well as a way to access health care services.

2.6.2 How is videoconferencing used in telepsychiatry?

Four general uses have been identified for telemedicine in psychiatric care: clinical, educational, administrative, and research.¹⁵ The most frequent uses are for consultations among health professionals, and for assessment and emergency evaluations of patients.¹⁸ Some clinicians advocate the use of telepsychiatry, primarily, for management of patients with previously established diagnosis¹⁹ and for education and training.²⁰ The proportion of videoconferencing time devoted to any specific activity appears to be determined by the needs and preferences of the community serviced by telepsychiatry.

Documented clinical uses of telepsychiatry include: diagnosis, education of patients, mental health team training, individual and group therapy, support in crisis situations, consultations for clinical outpatient care and for inpatient support, medication management, supervision, psychological testing, transfer of medical data, referral, follow-up, collaborative care and case conferences, research, administration, medico-legal and forensic evaluations, and commitment hearings.^{17, 21, 22}

Educational applications include training for patients and mental health workers¹⁶, and may involve specific activities such as tutorials, workshops, lectures, and professional supervision provided by large medical centres.²³ Importantly, telepsychiatry provides the opportunity for ‘indirect’ learning, which occurs when the primary care physician or another health worker attends telepsychiatric consultations with the patient.²⁴

Videoconferencing has facilitated a range of administrative activities, such as interviews, managerial meetings, coordination of mental health care, employment of personnel living far away from the workplace, and a reduction in travel by staff.^{25,26} Furthermore, in addition to a significant reduction in administration costs, the administrative streamlining ensuing from videoconferencing can result in an expedient delivery of complete mental health care.

2.6.3 Does videoconferencing allow accurate diagnosis?

Rigorous studies have established that videoconferencing can provide as accurate and reliable a psychiatric diagnosis as could be obtained from a face-to-face consultation.^{27,28}

Furthermore, videoconferencing has been shown to be an effective means of communication in the administration of psychiatric status rating scales, for cognitive assessment of individuals with a history of alcohol abuse, for assessment of forensic, child, and geriatric psychiatric patients, as well as for a number of specific mental health disorders: schizophrenia, obsessive-compulsive disorder, bipolar disorder; depressive, panic, and anxiety disorders (reviewed in²¹). However, information is still lacking, and recent reviews of literature on remote psychological assessment call for further studies with a broader range of demographic, clinical, and environmental variables.²⁹

2.6.4 Does videoconferencing permit effective consultation and treatment?

The use of videoconferencing to deliver mental health treatment is growing rapidly, but very little is known about it. There appear to be no detailed descriptions of psychotropic medication management by videoconferencing. Important questions about the clinical effectiveness of videoconferencing for the treatment of mental disorders remain to be answered. Can current videoconferencing technology support face-to-face discussion in psychotherapy with adequate picture quality? What effects telehealth interventions have on different clinical populations? What effect does videoconferencing have on therapeutic relationships? Do clients and providers find telehealth interventions accessible and desirable?

Telepsychiatry has evolved so fast that little is known about how professionals do consultation by videoconferencing, or how the technology affects the organization and delivery of mental health services. Videoconferencing seems to be more than just a new technology for communication. Arguably, it is becoming a new and different mode of communication and service organization.

2.6.5 Is telepsychiatry clinically effective?

Evidence that equal medical benefits arise from telemedicine and traditional consultations is lacking for almost all telemedicine applications. The sole exception is teleradiology, which relies mainly on the quality of transmitted still images, and for which a parity has been demonstrated²⁹. Nevertheless, several studies assessing the clinical effectiveness of telepsychiatry concluded that patients are no worse off for having been treated via videoconferencing, and that attendance of such sessions is in fact improved³⁰⁻³⁴. In regions where health coverage is poor and where health worker turnover is high, process-related outcomes such as the use of the service, its impact on decision-making, and the degree of patient and physician satisfaction, must also be considered. Comparing the application of telemedicine with conventional care may not always be possible, or sensible.

2.6.6 How do patients and physicians view telepsychiatry?

Psychologists and psychiatrists express concern that videoconferencing may compromise the range and quality of interactional information and thus affect the working alliance between client and therapist, and consequently the process and outcome of therapy.³⁵ A recent review concluded, however, that videoconferencing is an acceptable substitute for face-to-face consultation when the latter is not available, and that overall ratings by clinicians and other health workers tend to be positive.³⁶ Most view videoconferencing as a way to increase access to urgently needed health care services, which otherwise might not be available.^{37,38}

Overall, patient and physician responses to telepsychiatry have been positive. Patients usually give highly positive ratings for videoconferencing interviews as compared to face-to-face encounters, and some even feel more comfortable with teleconsultations.^{39,40} Threat to privacy is described as one of patients' most significant concerns, because video consultations often involve more than one health care worker, because the sessions might be recorded surreptitiously, and that telecommunications can be electronically "tapped".

Telepsychiatry provides a unique opportunity for a more complete multidisciplinary approach to dealing with mental health problems by involving primary care physicians, specialists, nursing staff, and other health workers. As such, it importantly provides psychological support to clinicians working in remote and isolated areas. Involving local health workers and family in teleconsultations has been shown to reduce patients' sense of isolation associated with the stigma of mental illness, and has provided treating teams with clinically relevant information and an idea of patients' social context.^{41,42} For patients who do not speak English as their first language, telehealth service in psychiatry may provide opportunities for cheaper and easier service delivery in their own language.⁴³

2.6.7 What telemedicine programs exist in Canada?

Twenty-five percent of Canadians live in rural, remote, and isolated, communities, which are served by only 10% of physicians and 4% of specialists.⁴⁴ The most under-supplied specialties are paediatrics, obstetrics and gynaecology, laboratory medicine, and, notably, psychiatry.⁴⁵ This lack of manpower and the considerable expense of providing medical care to large sparsely populated areas create significant obstacles to the provision of medical services to those communities.

The first telemedicine services in Canada provided telephone conferencing and some slow-scan teleradiology to off-shore oil rigs in Newfoundland.⁴⁶ Since then, a few provinces have implemented province-wide telemedicine programs (e.g., Newfoundland, Alberta), while others have yet to adopt any formal programs or policies. Nevertheless, medical centers in every province and territory engage in telemedicine-related activities, and today over 250 videoconferencing sites are in operation across Canada.

2.6.8 Is telepsychiatry appropriate for First Nations peoples?

Little is known about whether the type of service provided by telemedical applications is suitable for diverse ethnic populations and cultures^{47,48}, be it in Nepal or the American mid-west. The attitudes, expectations, and perceptions that users bring to new technologies such as videoconferencing must be considered in order to ensure the sustainability and effectiveness of services, and to ensure that interventions are safe and culturally appropriate.⁴⁹

2.6.9 Is psychiatry culturally appropriate?

Assumptions about values, beliefs, and relationships underlie encounters between psychiatrists and non-European populations. It is rarely acknowledged that Euro-centric notions of dysfunction and healing stand in glaring contrast to the non-European organic or spiritual definitions of mental illness.⁵⁰ Appropriateness of such rational and individualistic psychiatric principles for cultural groups who value spirituality and emphasize well-being of the community over that of any individual, is now being reassessed.^{50,51} First Nations people often perceive their relationship to others and to the world around them differently than does the cultural majority of North America.⁵² As a result, they may manifest serious psychological dysfunction and experience major mental disorders in ways unfamiliar to most mental health practitioners.^{53,54} More importantly, factors influencing the effectiveness of treatment, such as beliefs about the etiology of psychiatric disorders, the ability to influence events shaping one's life, characteristics of stress-inducing situations, and social attitudes towards help-seeking and help-providing behavior, are also different in First Nations cultures.⁵⁵

A recent review examined community support programs to determine whether they are responsive to ethno-cultural issues.⁵⁶ It revealed that interventions incorporating family networks are more likely to be culturally congruent and effective, and recommended that the strong support networks of patients with socio-centric cultures be tapped in the rehabilitation process. Family network therapy has been increasingly used as the preferred approach to dealing with mental illness among Native American populations.^{55,57} For First Nations people, day-to-day life is family-centered, such that family and kin relationships represent their most potent and lasting socializing influences.^{55,59}

Research examining the use of videoconferencing for group therapy or family counseling, although limited, reveals positive experiences, especially with regards to improved attendance over long periods of time in areas such as the management of chronic mental health problems.⁶⁰⁻⁶² For these reasons, and because videoconferencing permits family participation and allows the client to remain in the community while receiving care, telepsychiatry contributes positively in the delivery of culturally appropriate services to First Nations people, and in particular for those who are isolated from urban centres.

2.6.10 Is videoconferencing an acceptable mode of communication?

Using technology for health care may seem awkward compared to using it for communication or commerce. Some people living in large urban centers appear uncomfortable and self-conscious in videoconferencing⁶³, and those living in rural areas would seem more likely to be ill at ease in such situations. By some accounts, First Nations people have had an ambiguous relationship with science and technology.⁶⁴ Writers and artists often describe this relationship as associated with the memory and pain of multiple losses: the loss of culture, way of life, family, and the destruction of the environment.^{64,65} However, in these writings there also resides a message of hope.⁶⁴ In fact, First Nations people in North America and Australia have begun using the Internet for the benefit of their communities.^{66,67} The Warlpiri people of Australia have been using videoconferencing since 1992 for education, commerce, and health care, to allow separated family members to talk to each other, and to perform family and tribal rituals that in the past required long distance travel.^{63,68} In videoconferencing through the Tanami Network they perceive a return to traditional face-to-face communication, which, unlike television or radio, is interactive, conveys the extensive system of hand gestures used by Aborigines, and facilitates consultations that the Aborigine leaders traditionally employ in reaching community decisions.⁶⁴

Aptitude for videoconferencing is not unique to the Australian Aboriginal people. The least-Westernized people of India are quite comfortable with video images, and interestingly, the more traditional their life style, the more likely they are to be comfortable with this mode of communication.⁶⁴ One explanation for ease with which Aboriginal and non-technological societies embrace the video mode of communication proposes that the videoconferencing experience ratifies the belief systems and the ancient folklore of these cultures.⁶⁴ In a manner similar to spirits summoned by the shaman to report on occurrences or persons in distant places, to aid in curing the sick, to foretell the future, to locate lost objects, and in general to bring news and wisdom to the members of the community, the technology of videoconferencing can bring news and education, connect families, and aid in curing the sick.⁶⁹

Nearly every telemedicine provider outlines rules for appropriate videoconferencing conduct, such as to avoid fast speech and wearing bright clothing, since both have proven distracting. These rules of conduct call for a manner of communication that seems very much like the traditional style of First Nations societies. First Nations people consider it inappropriate to talk about oneself or to criticize others directly. It is a sign of disrespect to make sustained eye contact during a formal discourse, just as it is disrespectful to speak in a loud, rapid, and assertive manner.^{52,57} Among First Nations, assertiveness, confrontation, and individualism are considered rude and selfish, whereas a quiet respectful demeanor is encouraged⁵⁸, although generational differences appear to be emerging.

2.6.11 Is there a future for telepsychiatry in First Nations communities?

Telepsychiatry is still a cultural novelty - not the least to the Western society that produced it; and even more-so for many from outside the Western cultural framework. It should therefore be presented to the patient, First Nations or non-First Nations, in a culturally acceptable and respectful way.⁷⁰ It may be well advised to work with tribal or village leaders to create ethno-medical profiles in conjunction with programs in telemedicine cultural sensitivity.⁷⁰⁻⁷² It may be of benefit to clinicians providing telepsychiatry consultations to engage themselves in focus groups so as to better understand the culture of the clients they serve and the possible effects on them of interaction with videoconferencing technology.^{56,73}

3.0 The Keewaytinook Okimakanak Telepsychiatry Pilot Project

3.1 Overview of the Telepsychiatry Pilot Project

As originally conceived, the Keewaytinook Okimakanak Telepsychiatry Pilot Project was to use videoconferencing equipment to link First Nations clients, within their home communities, with a psychiatrist whose practice happened to be located in Winnipeg, Manitoba. A recent high demand for services from the Nodin Counseling Service Centre and the Sioux Lookout Zone Hospital has meant that First Nations clients may now spend long periods of time awaiting service. The purpose of the project was to test the feasibility of supplementing the existing mental health care services with telepsychiatric consultations that would bring professional mental health support to First Nations clients within their remote home communities, and thereby alleviate the long waiting times.

The First Nations Council undertook a project to provide telepsychiatric consultation service to each of the six Keewaytinook Okimakanak First Nations communities over the period from April, 2000 through March, 2001. Success hinged on the completion of a telecommunication land-link which was to be installed as part of a separate northern infrastructure development plan. However, when delays in the land-link project placed the telepsychiatry project in jeopardy, the community of Poplar Hill was recruited to participate in a modified program. The modified plan would require clients to fly out from the community, receive the telepsychiatric consult at the council offices in Red Lake (Balmertown) and return home, all in the same day.

The Telepsychiatry Pilot Project used the digital broadband communication network operated by K-Net Services, the information and communications technology (ICT) branch of the Keewaytinook Okimakanak Tribal Council. K-Net is leading a NAN-wide initiative to implement and accelerate the regional use of ICT as a means of economic and social development:

The development of a fair and equitable strategy for a telecommunications environment in NAN is recognized as an economic and social cornerstone for achieving and sustaining community well-being.⁷⁴

To improve overall access to services, the implementation of telehealth is a network priority because of its anticipated immediate impact on community well-being.⁷⁴ Several projects have been piloted in Keewaytinook Okimakanak First Nations and subsequently adopted by other NAN communities.

K-Net was subsequently selected as the First Nations project for the SMART Community Program, a national initiative by Industry Canada, currently underway, to encourage dissemination of ICT. The purpose of the SMART Program is to identify best practices in

the sectoral integration of broadband services for the delivery of multiple applications. Extensive community involvement is a requirement for this demonstration project, and telehealth services are one of seven major application areas in K-Net's business plan for this national demonstration project.

3.2 Poplar Hill and North Spirit Lake First Nations

Poplar Hill is an Ojibway First Nations community that was first settled around 1870. Originally part of the nearby Pikangikum band, it severed formal relationships in 1978 to become recognized as its own band. It has since grown to a population approaching 400. Firm in their desire to maintain a traditional way of life, many of its residents are reluctant to leave community, families, and jobs for medical care. Women may resist pre-natal care to avoid leaving the community for deliveries. Few young people seek high school education because of the need to leave the community (a new internet high school has been established as a response).

Recent municipal improvement and service expansion have been both extensive and relatively rapid. Over the past six years, Poplar Hill has built up infrastructure with a new school, new out-door sports facilities for hockey and baseball, many new houses, municipal running water, electricity, sewage treatment, and an airstrip with an instrument landing system. A new hotel, store and office complex has been built. Concurrent with these changes has been a sudden rise in the number of youth suicides within the community. Increased incidents of family violence have been reported, as well.

Poplar Hill was selected for the pilot project on a pragmatic basis: because of the acknowledged preference of its residents to remain in their community; because of its relative proximity to Red Lake (45-minute flying time, twice daily), where videoconferencing equipment, already in place, would enable clients to fly-out for consultation and return in the same day; and, because of the availability of supports developed by a visiting mental health consultant, and founded in a long-term association with the community.

North Spirit Lake is a Cree First Nations community with a population of 285, which is slightly more remote, geographically, than is Poplar Hill. Only one flight per day serves the community (60-minute flight time). Because of the need to make a flight connection at Red Lake, it can take a full day to reach Sioux Lookout from either Poplar Hill or North Spirit Lake. Most other communities have regular direct flights.

Until recently, only a single telephone linked North Spirit Lake to the outside world. Health care is still limited to a rotating visit by a nurse, two days a week, while most other communities have permanent, full-time nurses. Many North Spirit Lake residents move back

and forth frequently between their homes and other communities partly in an attempt to gain access to services.

Both Poplar Hill and North Spirit Lake have been affected by the suicide epidemic, although not to the same extent as some other communities.¹⁴ In 1999, Poplar Hill, with 2.0% of the population in the Sioux Lookout Zone catchment area, experienced 2.8% of the suicides. However, it accounted for only 1.0% of psychiatric referrals and 1.8% of referrals to Nodin, overall. Similarly, North Spirit Lake had 1.6% of the Zone population, again 2.8% of suicides, yet constituted only 2.0% of psychiatric referrals and 1.9% of Nodin's overall referrals. Compared to other Zone communities with similar suicide rates, both these communities have been using Nodin's psychiatric services, specifically, and its mental health counseling services, overall, at rates lower than might be expected. Thus, when the telecommunications land-link reached North Spirit Lake during the last three months of its operation, the telepsychiatry pilot project expanded to serve clients from that community, as well.

3.3 Implementation of the Telepsychiatry Pilot Project

3.3.1 Purpose of Service

The Telepsychiatry Pilot Project was implemented within a planning framework for regional health informatics and health infrastructure, with a guiding vision for:

“A health system that effectively uses health information and telehealth tools to improve community well-being and individual health by creating opportunities for the sustainable delivery of accessible, reliable and quality health services.”⁷⁵

The intent of the Telepsychiatry Pilot Project was to: *“...test the use of videoconferencing in the assessment, treatment and follow-up of persons with mental health difficulties.”⁷⁶*

Broadly, the pilot project sought to:

1. Test the efficacy of videoconferencing for mental health for isolated communities
2. Determine what structures, procedures and protocols must be followed for this approach to be effective
3. Compare the costs and benefits of videoconferencing in mental health services with those currently being offered.

Specifically, the goals of the telepsychiatry service were to:

1. Maximize access to professional services for isolated communities
2. Minimize disruption to clients
3. Utilize and enhance the capabilities of community support persons to support the overall care of the client.⁷⁶

The kinds of services planned were:

1. Assessment
2. Case conferencing and case management
3. Follow-up
4. Medication reviews
5. Education and training
6. Direct counseling
7. Family visits⁷⁶

The Keewaytinook Okimakanak Telepsychiatry Pilot Project was funded by a one-time operating grant from the Medical Services Branch of Health Canada.

3.3.2 Project Planning

The Pilot Project was implemented after considerable planning. Several issues identified during the planning stages (and outlined below) were thought to raise potential obstacles to the success of the program. Strategies involving extensive community orientation and education were developed to overcome them.⁷⁶

Confidentiality: To overcome the fear that the escort, translator or technicians might break confidentiality, clients would be allowed to choose their translator or escort, or one could be hired for them from the Red Lake office. Prior to each session and in the presence of the client, a confidentiality oath would be signed by escorts, technicians and anyone else involved in the process.

Discomfort with new technology: To overcome fears that an interview might be seen on public television, an educational video to include a mock interview would be prepared and shown to the communities to raise awareness. A pamphlet, in both English and syllabics, would be distributed throughout the communities and reviewed with clients. In the communities, the mental health consultant would inform and educate people through public meetings, personal contacts, and community radio. Unfortunately, the mock interview could not be completed due to technical difficulties with the equipment. However, other components were completed as planned.

Concerns about the need for personal contact with therapists: To provide personal support such as accurate translation, comforting and debriefing, the service would focus on consultation rather than on direct service, so as not to be dependent solely on outside professionals for primary support. Clients would be permitted to select an escort with whom they felt comfortable. The mental health worker from the community would attend sessions and act as a counselor, under the direction of the professional.

Allaying the fear that telepsychiatry undermines treaty rights: Fears that program-based funding for health care might be a cost reduction strategy that could undermine treaty rights to health care (previously provided through fee-for-service funding) would be overcome during the education process during which the community would be informed about the purpose of the project. It would be explained: that both community members familiar with the program, as well as the clients, themselves, would be actively involved in the evaluation process; that the evaluation results would be shared with the communities; and, that the community's recommendations for the future of the service would be followed.

3.3.3 Project Operation

The pilot telepsychiatry service was managed by a project coordinator in Sioux Lookout and operations took place in Red Lake. The coordinator was a social worker who also worked as a consultant to the communities. A total of forty consultation sessions were conducted over the twelve-month period during which the service operated.⁷⁸ As a result of the modifications to the project design implemented due to delays in the installation of new telephone equipment, clients from the First Nations community of Poplar Hill travelled by air to the Red Lake (Balmertown) offices of Keewatinook Okimakanak where, using videoconferencing equipment, they were interviewed by a psychiatrist in Winnipeg, Manitoba.

When the new telephone equipment became available in North Spirit Lake during the last three months of the project's operation, it was possible to offer telepsychiatric service to clients referred from that community, as well. As was the intent behind the original project, through videoconferencing, these clients were able to obtain professional mental health care, yet remain within their home community for the consultation process. The few consultations conducted in this manner were completed at North Spirit Lake.

4.0 Evaluation Plan

4.1 Approach

The evaluation was planned and conducted using a naturalistic and participatory approach.^{78,79} It was naturalistic in being based extensively - but not exclusively - on the experiences of those who used, and those worked with, the service. The evaluation was participatory in that it was planned and conducted collaboratively with the client, through a task force that included:

- The Health Director for the Keewatinook Okimakanak First Nations Council
- The coordinator for the pilot project
- A health planning consultant who has worked closely with the client
- Two mental health workers and a community health worker from the two communities using the service
- Two research associates from the Queen's Centre for Health Services and Policy Research, and a graduate student from the University of Toronto.

The evaluation was formative in assessing the design and implementation of the service to assist its future adjustment and refinement. Finally, the evaluation was summative in assessing the short- and intermediate-term effects of the telepsychiatry service on health outcomes and on the organization of mental health care service delivery, along with the cost effectiveness of the program.

4.2 Evaluability Assessment

Planning for the evaluation of the Telepsychiatry Pilot Project was initiated at the time it was proposed, and resulted in the collection of several kinds of data during the operation of the pilot project. Subsequently, the evaluators and the task force conducted an evaluability assessment. The aim of the evaluability assessment was to build on the existing information and consider additional ways in which the goals and objectives of the pilot project could be evaluated. A program logic model (PLM) was prepared through discussion and with reference to available documentation. A PLM is a graphical representation of the intended or actual causal relationships between program inputs, activities and outcomes, both short- and long-term. The PLM for the Telepsychiatry Pilot Project, presented in Table 1, below, displayed four major components to the service for which evaluative questions, criteria and assessment procedures were identified.

Table 1: Telepsychiatry Pilot Project Program Logic Model				
Component	Community Orientation	Telepsychiatry Services	Training and Support	Evaluation
Activities	<ul style="list-style-type: none"> * Create and distribute pamphlet * Create and broadcast video of mock interview * Community visit by psychiatrist * Community radio show 	<ul style="list-style-type: none"> * Assessment * Follow up * Medication Reviews * Counseling * Family visits 	<ul style="list-style-type: none"> * Participation in case management * Education and training 	<ul style="list-style-type: none"> * Cost effectiveness analysis * Chart review * Client post-session survey * Client follow-up survey * Interviews with health care providers
Target Groups	<ul style="list-style-type: none"> * Community residents 	<ul style="list-style-type: none"> * Community residents with mental health problems who require specialized care 	<ul style="list-style-type: none"> * Community health/support workers * Professionals in community 	<ul style="list-style-type: none"> * Communities * Tribal Council * Zone Health Authority * FNIHB * Others?
Short-term Outcomes	<ul style="list-style-type: none"> * Familiarize the community with the technology, process and person providing the consultation 	<ul style="list-style-type: none"> * Supplement existing mental health services * Increased number of referrals for psychiatric services * Reduced waiting period for psychiatric services * Reduced need for travel * Reduced number of emergencies * Reduced costs for service 	<ul style="list-style-type: none"> * Increase knowledge of health problems * Increase skills in treatment and case management in the community 	<ul style="list-style-type: none"> * Inform planning of future mental health services * Support request for new funding
Long-term Outcomes	<ul style="list-style-type: none"> * To promote healing and 'wellness' in the community by increasing local control of mental health treatment. 			

4.3 Evaluation Design

The evaluation has two, relatively independent aspects: economic and clinical.

4.3.1 Cost Effectiveness Analysis

Cost effectiveness analysis is a means by which to assess decisions or choices that affect the use of scarce resources. This evaluation was designed to compare the costs of providing mental health counseling through: a) the methods used heretofore; b) the pilot project itself; and, c) the potential costs of an optimally designed program using telepsychiatric counselling services. By identifying the component parts of the project and their related costs, the analysis sought to determine the most economically efficient way of meeting the public objective of providing tele-mental health service to the remote communities of Polar Hill and North Spirit Lake; and through that, to assist decision makers determine the merit of pursuing the service as an ongoing program.⁸⁰

4.3.2 Analysis of Clinical Service

A ‘multi-group post-test only’ design⁸¹ was used to evaluate the effects of the service on patients, on treatment professionals and on service organization.

The groups were the communities of Poplar Hill and North Spirit Lake. The main strengths of this exploratory, non-experimental design are its simplicity, feasibility and its appropriateness for uncovering and assessing relationships between the objectives of the pilot project, its activities and results. The main limitation is that it does not control for rival explanations, such that observed changes may be attributed to causal factors other than the service. Hypotheses about the effects of the pilot service identified in the present evaluation can be studied in future evaluations using more rigorous descriptive or explanatory research designs with pretests and control groups.

4.4 Evaluation Questions

The evaluation of the Telepsychiatry Pilot Project addressed a range of questions under the categories identified by Field⁸² for the evaluation of telemedicine applications:

4.4.1 What were the costs of the telepsychiatry service for patients, payers, providers and other affected parties compared to the alternatives?

- 1) When providing mental health care, using the current method of service delivery, what are the direct costs of delivering service, per consultation, to patients, payers, providers and other affected parties, in terms of money and time?

- 2) When providing mental health care through the telepsychiatry pilot project, what were the direct costs of delivering service, per consultation, to patients, payers, providers and other affected parties, in terms of money and time?
- 3) When using the service as it might be provided by a telepsychiatry program with videoconferencing equipment located with each community, what are the direct costs of delivering service, per consultation, to patients, payers, providers and other affected parties, in terms of money and time?
- 4) In comparing the three scenarios, what cost were transferred into, out of, and across the system?
- 5) Considering the cost of setting-up a full telepsychiatry program, how many patients must be seen in order to realize any cost efficiencies that may be available (i.e., when would such a program become cost-effective)?
- 6) Assuming equal clinical effectiveness which scenario has the highest cost efficiency?

4.4.2 What were the effects of the telepsychiatry service on the clinical process of care?

- 1) Were the preparation activities implemented as planned?
- 2) How successful were the preparation activities?
- 3) Were telepsychiatry sessions implemented as planned?
- 4) Did mental health and nursing staff think that they were able to implement the activities as planned? If not, what factors limited them?
- 5) How many clients participated in the project?
- 6) Were there more referrals than expected?
- 7) Did staff have an increase in knowledge about their clients?
- 8) What kinds of services were provided? With what frequency?
- 9) What effect did video consultation have on the delivery of services at Poplar Hill, North Spirit Lake, Red Lake, and Sioux Lookout?
- 10) How did video consultation affect the way professionals communicate and work?

4.4.3 What were the effects of the telepsychiatry service on health outcomes?

- 1) Did the clients feel the service was effective?
- 2) Did health care providers and community leaders feel the service was effective?

4.4.4 What were the effects of the telepsychiatry service on access?

- 1) What were the demographic characteristics of patients referred for consultation?
- 2) Was this the intended target group?
- 3) Were others reached?

- 4) What were clients perceptions of access to telepsychiatry services compared to the alternatives?

4.4.5 How did patients, clinicians, and other relevant parties view the telepsychiatry service and were they satisfied with the application compared to the alternatives?

- 1) How did clients find out about the program?
- 2) Were clients prepared for the session?
- 3) Were clients relaxed?
- 4) Were clients satisfied?
- 5) Did clients feel the service was effective?
- 6) Was the community familiarized?
- 7) Were health service providers satisfied?
- 8) Were community leaders satisfied?

4.5 Data Sources

4.5.1 Cost Effectiveness Data

The financial officer for the Keewaytinook Okimakanak First Nations Council provided known costs and cost estimates necessary for the cost effectiveness analysis. Through interviews with the health director, the mental health coordinator, the visiting social worker and the K-Net Services coordinator an understanding was developed of the functional operation of mental health care delivery in the north, before the telepsychiatric project, and during the period the project was in place.

4.5.2 Clinical Data

4.5.2.1 Chart review

The pilot project coordinator, who prepared the referral and session notes, conducted a chart review. As the referral and session notes were in narrative form, the first step was to examine them with the coordinator to identify the kinds of demographic and clinical data relevant to the service and its results, which could be reliably extracted and coded for grouped analysis. These demographic and clinical variables are listed in Section 4.6.2. The data extracted were anonymous, and contained no personally identifying information. The extracted data were collated and descriptive statistics were tabulated.

4.5.2.2 Client post-session questionnaire

Quantitative and qualitative data were summarized from a questionnaire completed by patients following the videoconferencing sessions (Appendix B). Data were entered into electronic files without individually identifying information. Quantitative data were tabulated and qualitative data were content analyzed for common themes.

4.5.2.3 Client follow-up survey

In each of the two communities, the clients of the telepsychiatry service were selected by a local health worker. The two surveyors, who were also members of the evaluation working group, were familiar with the pilot project and were known to community members. The survey (Appendix C) was drafted with the coordinator and one of the surveyors. Data from the survey were transcribed and content analyzed for common themes.

4.5.2.4 Interviews with health care providers

Professional and paraprofessional health care workers who either worked with the service or whose work may have been influenced by it were interviewed during the site visit, and subsequently, by telephone.

These providers included:

- The Health Director for Keewaytinook Okimakanak First Nations Council
- The coordinator of the telepsychiatry pilot project
- Two community health directors
- A community nurse
- Two mental health workers
- Two community health workers
- The psychiatrist
- Director and two staff members of Nodin Counseling Services in Sioux Lookout

Individual and group interviews were conducted, either face-to-face during the site visit or subsequently by telephone, using interview guides that identified main topics. Participation in the interviews was voluntary.

The transcribed interview notes were analyzed using the grounded theory method⁸³, through which concepts, categories of concepts, and relationships among them were identified from respondents' statements about their perceptions and experiences. Patterns, themes and categories emerge out of the data rather than first being imposed on them.⁸⁴

4.6 Evaluation Criteria

The main kinds of criteria used in the evaluation of telemedicine are access, quality and cost. Indicators of these criteria are presented below:

Criterion	Data Source
4.6.1 Cost Analysis / Value-added of Service	
Access	Interviews
Travel time	Interviews
Substitution of care	Interviews
Direct costs/savings	Interviews
Indirect costs/savings	Interviews
Service-specific costs/savings	Interviews
Transaction costs	Interviews
Costs per consultation and breakeven analysis	Interviews
Cost transfers into, out of, and across system	Interviews
4.6.2 Access	
Client demographic characteristics	
Age	Chart review
Gender	Chart review
Usual living arrangements	Chart review
Education level	Chart review
Referral source	Chart review
History	Chart review
Client diagnostic characteristics	
Psychiatric diagnosis	Chart review
Severity	Chart review
Co-morbidities	Chart review
Reasons for referral	Chart review

Criterion	Data Source
4.6.2 Access (cont'd)	
Usage / Adoption - Session level	
Number of hours - duration	Chart review
Number of patients	Chart review
Number of appointments kept/missed	Chart review
Type of consultation	Chart review
Content of care	Chart review
Refusals, cancellations, no-shows	Chart review
Waiting list	Chart review
Disposition	Chart review
Follow-up	Provider interviews
Continuity of care	Provider Interviews
Effects on organization of service delivery	
Changes in referral/visitation patterns of clients	Provider interviews
Changes in consultation process and communication structure	Provider interviews
Changes in local patterns of referral, service delivery and disposition	Provider interviews
Barriers to implementation	Provider interviews
Operational issues	Provider interviews
Client access	Client form
Continuing education of CHWs	Provider interviews
Other kinds of usage (including new applications in other specialties)	Provider interviews
4.6.3 Quality	
Perceptions and Satisfaction	
Patient	
Usability	Client form
Perceptions	Client form, Survey
Satisfaction	Client form, Survey
Use again?	Client form
Preferences	Client form, Survey
Comfort level	Client form
Privacy	Client form
Effectiveness	Survey

Criterion	Data Source
4.6.3 Quality (cont'd)	
Perceptions and Satisfaction (cont'd)	
Professional	
Usability	MD interview
Perceptions	MD interview
Satisfaction	MD interview
Use again?	MD interview
Preferences	MD interview
Comfort level	MD interview
Privacy	MD interview

4.7 Communication Plan

The present technical report was presented to Keewatinook Okimakanak First Nations Council. A report on the evaluation results was also prepared for each of the communities that used the service.

4.8 Consent and Confidentiality

Examples of the client Consent to Participate form and the Oath of Confidentiality used during the operation of the pilot project for patient participation in research are presented in Appendices D and E.

A letter of information and research consent form for former patients about the follow-up survey and the chart review are presented in Appendix F and G.

For the interview with health care providers and community leaders, the confidentiality requirements are different than for clients. This is due to the small number of key informants and their visibility within their communities. Accordingly, they were asked for views that they were willing to share in public, but that off-the-record views would be respected as such. A letter of information to this effect is presented in Appendix H.

5.0 Findings : Cost Effectiveness

5.1 Cost Effectiveness Evaluation

The goal of a cost effectiveness analysis is to identify the most economically efficient way of meeting a public objective. It is a means by which to assess decisions or choices that affect the use of scarce resources. It seeks to place a value on the costs and quantify the effects of a single policy or program to assist decision makers in determining the merit of pursuing the policy/program. It will address the policy or program at a number of levels to identify and relate its component parts, to minimize the costs of achieving a given result, and/or to maximize its effectiveness within a given budget or set of available resources.⁷³

With cost effectiveness analysis, the investigator considers a specific policy or program (in this case, a program) and its relevant alternatives. The method involves a systematic identification of program components and their economic consequences. The analysis then compares the costs and effects of each alternate program, component by component, to determine the relative cost effectiveness of each alternative. It can be a formal economic analysis to determine which action will improve economic efficiency the most, regardless of who within the economy actually gains or loses as a result. Or, it can be a less formal framework for organizing quantitative and qualitative information to describe positive and negative effects of a program. This can include both monetary and non-monetary costs and benefits, impacts on different economic interests and positive and negative physical effects, in this instance, on the provision of mental health care.

The cost effectiveness portion of this evaluation falls between these extremes, but is closer to the latter than the former. It uses economic efficiency criteria to examine the impact of the proposed change, the transfer of economic burden, accountability, the value and overall impact of economies to scale.

The usefulness of a cost effectiveness analysis to this evaluation of the Keewaytinook Okimakanak Telepsychiatry Pilot Project lies in its ability to describe, compare and contrast the costs and effects of alternative programs. The analysis begins with a description and cost analysis of the means by which mental health care is currently provided to remote First Nations communities in Northwestern Ontario. It then does the same for the Telepsychiatry Pilot Project, as it was in place. Lastly, it uses the information gathered to describe a telehealth program to deliver mental health care to remote First Nations communities that makes optimum use of talent and resources that may be reasonably available to the Keewaytinook Okimakanak First Nations Tribal Council.

5.2 Framework for the Cost Effectiveness Evaluation

During the period from April, 2000 through March, 2001, the Keewaytinook Okimakanak Telepsychiatry Pilot Project provided a telepsychiatry service to the First Nations communities of Poplar Hill and, for the last three months, North Spirit Lake. While the original program was to use teleconferencing equipment to link clients from all the Keewaytinook Okimakanak communities with the psychiatrist, in Winnipeg, Manitoba, unforeseen circumstances necessitated the service to be limited to clients from Poplar Hill, and required that they travel to Red Lake (Balmertown) for their consultation. As noted earlier, when the difficulties were resolved, it was possible to include clients from North Spirit Lake, who were able to receive care while remaining within their community.

This evaluation makes a pre / post comparison of the process of providing mental health care, of a type comparable to the service being provided through telepsychiatry, as it has been provided in recent years, as it was provided through the project, and as it might be provided, should a fully funded program be initiated. The analysis contains a detailed description of the component equipment and each process, and the distribution of costs associated with service provision, and their impact on budget envelopes; as well as an assessment of each as an effective and cost-efficient method to provide some of this care.

5.3 Providing Mental Health Services to Remote Communities without Telepsychiatry

The process whereby mental health care has been (and now continues to be) provided began with a referral to the mental health consultant for assessment. Such a referral may have originated with the mental health consultant, herself, the community health nurse, the community mental health worker, or it may have come through the art therapist, a visiting crisis team, the client's family or school, community chief & council, or from the police.

The mental health consultant travels to the community on a four to six-week cycle, staying for five days during each visit. The mental health consultant will meet with each client presenting with mental health issues to discuss the situation, assess the client's condition and formulate a plan of action. An array of interventions are available choose among. If the client is in crisis, with serious risk of harm to self or to others, it may be decided that the client should immediately fly out of the community in a 'MediVac' aircraft, as a medical emergency to be seen at the Sioux Lookout Zone Hospital, and/or to see a psychiatrist or receive counseling at Nodin, or to be admitted for institutional care at a facility in Kenora.

If not in crisis, an appointment might be scheduled with a psychiatrist or plans made for counseling at Nodin. The date of such an appointment would usually be several weeks in the future. In these instances, travel will be arranged through a local commercial flight.

Accommodation would be arranged at the hostel adjacent to the hospital or through approved hotels in Sioux Lookout. Alternatively, a 'geographic cure' might be deemed appropriate, wherein the client agrees to move to another community to draw upon another support system that might be available; with family or at a shelter, for instance. Upon return to the community, such care would be supported with visits to the community clinic (for dispensing of prescribed medicines, for example) and/or follow-up interviews with the community mental health worker.

It may also be possible to provide appropriate care and support for the client within the community in the first place. In such an instance, this could entail follow-up work by the community health nurse and/or the community mental health worker, or the mental health coordinator could follow-up with the client during her next visit.

5.3.1 If the Action Involves a Referral to Nodin

Heretofore, when a client presented at the community health clinic and, in turn, was referred to a psychiatrist or mental health worker, the client would need to travel out of the community to Sioux Lookout in order to receive that service. Thus, following the referral, a complex series of events will need to unfold before the client can actually receive the appropriate care. First, a referral form is completed and faxed to the Nodin Counseling Service Centre, located in Sioux Lookout. Nodin provides four basic services: acute care, community crisis support, community development and training, and consultant psychiatric services. The latter is possible through the services of a group of psychiatric specialists under contract with SLFNHA, who rotate through Nodin on a (roughly) six-week periodic cycle, serving the community for a week at a time (i.e., one 5-day week period, eight to ten times a year). If the referral is accepted, an appointment is scheduled and the client is placed on a waiting list to be seen by a psychiatrist or counselor.

While the client awaits the appointment in Sioux Lookout, efforts are made to ensure an escort will be available to accompany the client throughout the trip. Travel and accommodation for both client and escort must also be organized. It is especially important such arrangements are properly coordinated in the instance of a mental health case, since the services of an escort are deemed essential to the care of the client and the authorization for engaging one is granted automatically.

The role of the escort cannot be underestimated. It is the responsibility of the escort to remain with the client **at all times** during the trip; to the point of sleeping in the same room with the client. It is the escort's responsibility to see that things get done: that the travel schedule and arrangements for accommodation at hotel or hostel are kept, and that the client is kept safe and arrives at all appointments on time. Thus, he or she must be a very responsible individual, experienced with life outside the community and be **very** competent in the English language. The escort is someone upon whom the client is going to rely heavily

during the journey to Sioux Lookout, so it is also important that the escort be someone with whom the client is very comfortable. If possible, it would be best if the escort was a family member. However, this in itself can create additional difficulties for the client since, if young children or aged parents are to be left behind in the community, should the escort be relative, this would leave one less person at home to take up these family responsibilities.

The role of the escort is a wholly voluntary position, entirely unpaid, although the Department of Non-Insured Health Benefits (NIHB) of the FNIHB at Health Canada do authorize travel and accommodation expenses of both client and escort. Thus, while the escort is not out-of-pocket for services rendered, there is no remuneration, either. The task of escort entails challenging responsibilities and the standards to be met are exceedingly high. Is it unreasonable to ask how often those who would serve as escorts and who can meet those high standards, lay-people with other obligations to family and community, will give of themselves in this manner? Yet, those living in remote communities and in need of mental health care must depend on the willingness and motivation of such volunteers.

As mentioned, if the client is in absolute crisis, and there is a specialist or appropriate counselor available to see the client upon their arrival, a MediVac aircraft may be called in to evacuate the client, at a cost of about five thousand dollars (\$5,000.00) per flight. More often, the client will not be in crisis, and the client and escort will travel by a local commercial airline which provide air-service, once or twice daily, to and from First Nations communities in the area. Generally, these flights are not direct from the communities to Sioux Lookout. More usually, flights land at Red Lake where the client and escort catch a connecting link to Sioux Lookout. The appended tables (Appendix I: Tables I (i), I (ii), and I (iii)) present itemized lists of the expenses that could be expected for such a journey and the sources of funding to cover those expenses.

The journey begins when the community van picks-up the client and escort at their residences and transports them to the community airport where they board the flight for Red Lake, where they catch a connecting flight to Sioux Lookout. If completed in one day, the journey to Sioux Lookout can take between three and eight hours, depending on the flight connections made at Red Lake. Once the client and escort have arrived in Sioux Lookout, they check-in with the Airport Interpreter who ensures the client is organized for the services he or she will require (e.g., transportation to the hostel, room at the hostel or hotel, food vouchers, etc.). They then travel to the hostel, adjacent to the Zone hospital, or should the hostel be full, to a room at an authorized hotel where the rates will have been pre-approved by NIHB. If staying at the hostel, meals are generally taken at the hospital dining room with payment made using meal vouchers provided through NIHB. If staying at a hotel, meals are taken at the hotel and, subject to a daily allowance, charged to the hotel bill. If staying at the hostel, the client and escort will generally walk to the hospital, a distance of a few metres, or they will walk or be driven in the SLFNHA van, to the Nodin Counseling Service Centre,

a distance of less than a kilometre. If staying at a hotel, the distances involved would be several kilometers and require the services of the SLFNHA van or a taxi.

The client can generally expect to have a single 1½ hour consult with a psychiatrist, which may be followed with a prescription for medication and/or a regime of follow-up or monitoring sessions in the community with the mental health worker, the mental health trainee or the community health nurse. If, at a later date, a further consultation is deemed appropriate, the probability of being seen by the same psychiatrist is quite small due to the rotation schedule of the contract specialists. The resulting lack of continuity in care can become a serious issue with more complex mental health cases where such continuity is an increasingly more important element of remedial care.

A referral to a mental health worker in Nodin could result in a single session or a series of sessions, for 1 to 1½ -hours per day over a four or five-day period. In such an instance, the case management plan would concentrate on the issues at hand, aiming to lower the risk to the individual. It could involve teaching coping strategies to assist the client deal with such issues in the future. At Nodin, counseling is done by First Nations staff who may or may not have had formal training, but who have demonstrated a sensitivity and capacity to care and who often draw on personal life experiences for the counsel they offer.

In either instance, upon completion of the service, a discharge plan is decided upon and, if appropriate, a medication regime is arranged and arrangements are made to ensure the medication will be available to the patient through the community's health centre. This information will be provided to the mental health consultant, the community health nurse and/or the community mental health trainee. An 'in-community' case management plan is, thus, set in motion which may extend over a year, depending on the vulnerability of the client.

The client and escort then return to the hostel where plans for their travel back to the community are made, and they begin their journey home. The SLFNHA van shuttles them to the Sioux Lookout airport where they board a flight to Red Lake and the connecting flight to their home community. Here they are met by the community van which transports them either to the community health clinic, where they check-in, or to their respective homes. Again, depending upon the flight schedule, this could require an additional night in either Sioux Lookout or Red lake, the cost of which would be borne by NIHB.

Thus, attending a psychiatric or counseling session in Sioux Lookout could take a minimum of 36 hours (i.e., 2 days with a single night stay-over) of two individuals' time, or it could require the resources necessary to permit two people to be away from their daily routine for a period as long as a full week (i.e., 168 hours). The implications for a client's job and his or her ability to meet family obligations, therefore, could be significant. And, it ought not to be forgotten: the escort is volunteering his or her time! All this time and organizational

effort results in one person receiving a psychiatric or socio-therapeutic intervention for as little as 1½ hours with a psychiatrist or, at the most, 14 hours of counseling.

5.4 The Cost of Providing Mental Health Counseling to Remote Communities

The cost of providing and receiving mental health services has two primary components. While it is important to understand how much such services cost, it is also important to appreciate who pays for it. That is, it is necessary to be aware of whose discretionary budget the various components of the service are funded; and, of course, the corollary: into whose coffers are these funds transferred?

Using Poplar Hill as an example, the minimum overall cost of a journey for an individual, with an escort, to travel to Sioux Lookout for mental health services and the therapy received there is \$2716 for a 1½-hour session with a psychiatrist. Alternatively, the minimum cost to send an individual, with escort, for a series of 1 to 1½-hour sessions with a mental health counselor over a period of four days amounts to \$4078. The component elements of these costs are presented in Appendix I (i).

The values presented are deemed to be the minimum cost, and could conceivably be more. For example, the cost of getting to and from Sioux Lookout for a mental health session could rise, if circumstances did not permit flights to and from the community minimize time and cost. The value of travel in the SLFNHA van has arbitrarily been set as the value of the next best alternative (a taxi), as has the value of the stay at the SLFNHA hostel (a hotel). These are reasonable values since, on average, there are 60 people from First Nations communities in Sioux Lookout for medical reasons, yet the hostel has only 39 beds. This means that, at any time, one third of these people must in stay overnight at hotels. Also, the fixed costs of administration and maintaining the Nodin offices has arbitrarily been estimated to be 20% of their annual budget, expressed at an hourly rate for an 8-hour day, a 5-day week and a 52-week year. This may well be an underestimate.

The Nodin Counseling Service Centre's 2000/2001 annual budget of \$1.5 million supported the thirteen counseling staff, the traditional healer, the art therapist and additional administration staff, as well as the visiting psychiatrists, who were also paid from the Nodin budget envelope. A rotation of seven consulting psychiatrists visited Nodin in nine trips, such that psychiatric care was available for a total of 57 days during the year. This annual budget also covers Nodin's staff travel expenses, as well as capital and operating budgets. With these resources, Nodin serves the First Nations people who live in the Sioux Lookout Zone, a population exceeding 15,000, including the almost 3,000 people who dwell in the six Keewatinook Okimakanak communities.

During the fiscal year 2000/2001, Nodin served 870 clients at their Sioux Lookout facility, 157 of whom were seen by a psychiatrist. A further 1,372 clients were seen in outreach support within these clients' own communities, and of those, 53 were seen by psychiatrists who travelled-in for the consultations.⁶⁶ On average then, Nodin made a per client expenditure of \$668, during the 2000/2001 fiscal year, and with that, provided mental health counseling to those referred to its door in need of support. These funds were allocated through the First Nations and Inuit Health Branch of Health Canada and administered by the Sioux Lookout First Nations Health Authority.

5.5 Providing Mental Health Service to Remote Communities ~ Telepsychiatry

Through videoconferencing, a psychiatrist can provide care and support to clients in remote communities where the necessity to travel to a location some great distance from the community adds the burden and inconvenience of leaving home to what is already a difficult situation. While telepsychiatry cannot be deemed an appropriate alternative means to provide care for all the mental health issues that present at the community health clinic, there are many instances where care provided through this medium may be both appropriate and timely. As such, telepsychiatry may be viewed as a means to deliver services that complement the more traditional face-to-face consultations between client and mental health professional. The question, at this point, is really whether this method of care delivery is an efficient and effective application of resources when compared to alternatives available to the community.

5.5.1 The Component Parts of a Telepsychiatric System

The success of a telepsychiatry system depends upon the capability of videoconferencing equipment to transmit telecommunication signals of sufficient quality over telephone lines to bring a psychiatrist and a patient together, and permit the psychiatrist to perceive all the client's communication clues, vocal and physical. The minimum equipment required accomplish this is: a comfortable and appropriately furnished room at each end where privacy can be assured; the telecommunication infrastructure necessary to establish a satisfactory telephone link between the rooms; a microphone, video camera and monitor; and, a specialized computer and software specifically designed to link the hardware components together, configure them to function as desired and route the communication signals among them. In the case of a full telepsychiatry program to serve Keewaytinook Okimakanak, a set of patient-end tele-video components would be required in each First Nations community to link them directly with the psychiatrist's office.

In addition to this, the services of an individual knowledgeable in the set-up and operation of the equipment and an administrator to schedule and co-ordinate the consultation session would be required. The presence of a mental health care specialist at the patient end of the

tele-link would also be advisable so that the patient could be instructed in what to expect and be made to feel comfortable with the technology prior to the actual consult with the psychiatrist. It is possible that these three roles could be undertaken by a single, appropriately trained individual.

5.5.2 The Telepsychiatric System - Infrastructure for Broadband Access

In the mid-1990s, the chiefs of Keewaytinook Okimakanak identified telecommunications as a means to provide enhanced levels of health and educational services and improving community well-being. Through K-Net, a broadband service with dial-up capability was installed in Sioux Lookout and client computers with dial-out capabilities were installed in the communities. This development project was initiated as a technology demonstration project, under the auspices of the FedNor SMART Community program, which focused community and regional attention on the use of telecommunications as a economic and rural community development tool in remote and rural settings.

The project included a regional analysis of telecommunications needs, development of a multi-stakeholder agreement to extend basic (residential telephony services to two communities and to upgrade the analog microwave backbone, and to provision data communications services to five Keewaytinook communities. As of 15 January, 2001, a tier one broadband services frame relay access was available in four of Keewaytinook's five communities. A fifth community was connected via satellite under a unique hybrid system.

K-Net worked with private and public sector partners to ensure that regional telecom priorities were addressed and that carriage capacities would meet its long range goals. Several telecom projects helped support this development. Telephone service was installed in North Spirit Lake First Nation in April 2000 and Keewaywin First Nation in December 2000. This development was completed in partnership Bell Canada, with funding from FedNor, HRDC, INAC and the Province.

K-Net has proceeded incrementally in developing and implementing its programs, which has yielded the positive effect of reducing the scope of the overall grand project to manageable bits, while maintaining its focus on the goal of high quality access to broadband applications. Smaller projects also created a practical awareness at the community level and identified primary needs and capacities in each community. The result has been a community-driven effort that reflects local buy-in and focuses on building sustainable capacities among individuals and between First Nations.

5.5.3 The Telepsychiatric System - The Videoconferencing Equipment

Building on lessons learned through the broadband access project, K-net drew upon its experience in building strategic alliances and partnering, on behalf of the telepsychiatric

project, to acquire and set in place the equipment necessary to permit the videoconferencing to take place. Through a contract agreement with London Psychiatric Hospital Group and Virtual Professional Incorporated (VPI), K-Net acquired three Zydacon videoconferencing suites (computer, camera, microphone and monitor) which were installed in the Keewaytinook Okimakanak offices in Red Lake (Balmertown), in the psychiatrist's offices in Winnipeg, and eventually, in the medical centre in North Spirit Lake. As well, the videoconferencing equipment, specialized ISDN telecommunication lines and Type 56 switches were required at each videoconferencing site to ensure satisfactory signal strength was transmitted and received. Because the signal from a single line was deemed unsatisfactory, it was necessary to install two ISDN lines in Winnipeg and four Type 56 dial-up lines in Red Lake, which together permitted a transmission rate of 256 kilobytes per second. This yielded a satisfactory quality in transmission of audio and visual signals.

In total, the cost of setting-up the video conferencing equipment used in the pilot project, its installation, as well as the expenses for technical staff and training for community mental health support was just over \$59,500. Of that, \$42,417 was for capital equipment, outright, about \$8,640 was for specialized ISDN telecommunication line installation and monthly line charges, and about \$5,000 was allocated to bring the mental health consultant and community mental health workers to Red Lake for training on the equipment (note Appendix I (ii)). Not all of this was borne by Keewaywin Okimakanak through the pilot project budget. Some of the equipment was acquired in-kind from service partners in the pilot project.

5.6 The Keewaytinook Okimakanak Telepsychiatry Pilot Project ~ A Complement to Traditional Methods of Delivering Mental Health Care

The process whereby clients present at the community health centre with mental health issues, are attended by the mental health consultant and a plan for remedial action formulated for each case did not change with the advent of the Keewaytinook Okimakanak Telepsychiatry Pilot Project. However, the number of mental health care options available to the client increased to allow him or her to make contact with a psychiatrist without (in theory) leaving the community.

When the proposal for the Keewaytinook Okimakanak Telepsychiatry Pilot Project was put forward it was assumed that the new overland telephone lines would be in place by the time the project got underway. Unfortunately, this would not be the case, and it became necessary to modify the operation of the service, to some extent. Without the telephone links in place, it was not possible for clients living in the two communities selected for the pilot project, Poplar Hill and North Spirit Lake, to actually receive the services within their communities, as was the plan. Decisions were taken to postpone the telepsychiatry service to North Spirit Lake until the telephone lines were in place and to provide a modified service to the Poplar

Hill community by setting up the patient-end telepsychiatry link at the Keewaytinook Okimakanak administration offices in Red lake (Balmertown). Clients from Poplar Hill who were referred for service would be flown to Red Lake for a tele-consultation.

The Keewaytinook Okimakanak First Nations Council contracted with a psychiatrist from Winnipeg, Manitoba, licenced to practice in Ontario, to consult as the psychiatric specialist. This psychiatrist was selected both because of experience and a strong interest in the area. For several years, this specialist has contracted services to Nodin as one of the rotating psychiatrists, and who thus has considerable experience with the kinds of mental health issues presenting in First Nations communities. As part of the pilot project, the psychiatrist set up an office-based tele-link in Winnipeg and was available for tele-consultations once or twice a month, for three or four hour periods at a time. Therefore, it was possible for the psychiatrist to consult with two clients, individually, during one three-hour session. Alternatively, it was also possible to consult with two or three clients, individually, or a client and a parent or care-giver, either individually or as a group, during a four-hour session. In this manner, it was expected the psychiatrist's practice would be adjusted to accommodate three or four tele-consultation clients per month. The pilot project was thus undertaken.

5.6.1 Telepsychiatry as Provided to Poplar Hill

In Poplar Hill, a client referred to the mental health consultant will present at the community health clinic for assessment during the week she in the community. (The consultant is contracted to provide service to several communities, on a rotating cycle, and is therefore available in each community for a period of one week in every four to six weeks.) At this time, an assessment is made and a plan of action established. If deemed appropriate, the client is referred for a psychiatric tele-consultation.

There are limitations with the ability to communicate satisfactory through a tele-conference when compared to a face-to-face consultation and not all cases that present at the community health clinic would be suitable for such a consultation. The appropriateness of a referral will depend on the number and complexity of issues presenting and the level of crisis in which the client finds him- or herself. A psychiatric consultation through videoconferencing is not appropriate, for example, if there is a perceived risk of imminent suicide.

The mental health consultant having secured an agreement to participate from the client, then schedules an interview for two to three weeks hence, taking into consideration the psychiatrist's availability (i.e., the schedule of appointments made previously for the days available for consultations), the client's preferences, the flight schedules from Poplar Hill to Red Lake and back, and the availability of the videoconferencing facility at the Keewaytinook Okimakanak council offices. (The videoconferencing equipment was set-up in the board room at the council offices and, while the room was committed for the time

periods allotted for the telepsychiatry sessions over the duration of the pilot project, it was always wise to ensure the room had not been double-booked for any particular day.)

One or two days prior to the interview, the mental health consultant provides the psychiatrist with the referral information (usually by fax). On the day of the consult, the client and escort are driven in the community van from Poplar Hill to the landing strip where they embark on an early flight to Red Lake. There, they travel by taxi to the Keewaytinook Okimakanak council offices, where they meet with the mental health consultant and a translator, should one be required, in the consult room (aka: the board room). The dial-up connections is made and the signal to the psychiatrist's office in Winnipeg checked. With introductions made, the consultation begins, with or without the mental health consultant in attendance, as required. At appropriate times throughout the day, meals are taken by the client and escort.

Following the consultation, the client and escort return to the Red Lake airport by taxi, board the return flight to Poplar Hill where they are met by the community van and are driven either to the community health centre or returned to their respective homes. In Winnipeg, the psychiatrist completes the session notes and, in a later telephone conversation, communicates a set of recommendations to the mental health consultant and, if appropriate, arranges for a regime of medication to be available for the patient through the community health centre. Again, an 'in-community' case management plan is decided upon with the patient, and set in motion. Generally, this follow-up care will involve the mental health consultant, the community health nurse and/or the community health trainee.

5.6.2 Telepsychiatry as Provided to North Spirit Lake

The service provided to clients in North Spirit Lake was as intended in the pilot project and more closely resembles how the service would be provided, should it into a full time program. In that instance the mental health consultant would first see the client during her week-long rotation visit to that community, when again a process of assessment would ensue and an appropriate plan of action be determined and acted upon. Again, if it was deemed an appropriate course of action, and having secured an agreement to participate from the client, a tele-video consultation would be scheduled with the specialist for a period some three to four weeks in the future, possibly during the week of her next rotational visit.

In the instance of a client from North Spirit Lake, the case notes would again be forwarded to the psychiatrist in Winnipeg a day or two before the consultation. However, since the connection would be between Winnipeg and North Sprit Lake, if not already present in the community, the mental health consultant would need to fly-in on the prescribed day, in order to be with the client during the interview. Furthermore, for the same reason, the services of an escort would not be necessary and, should a translator be required, it would be possible to arrange for one from within the community.

The videoconferencing session itself could take place in the privacy of the community health centre, and could be expected to last 1½ hours, on average, following which the client would return to his or her home, job or school, having committed little more than 2 to 3 hours to the process. Again, the psychiatrist would convey any recommendations during a later telephone call. A follow-up strategy would be devised and implemented, and the client would be monitored over the next year or so.

5.7 The Cost of Providing Telepsychiatric Mental Health Counseling Services to Remote Communities

Even in the instance of the tele-video consultations with clients from Poplar Hill, which required clients and escorts to fly to Red Lake for the consultations, the overall cost was \$1,934 or 71% of the \$2,716 it would cost for a similar face-to-face consultation with a psychiatrist at the Nodin facility in Sioux Lookout (Table 2 and Appendix i (ii)). While the hourly rate charged by the telepsychiatrist is 25% more for each 1½-hour session within the 3-hour session block than is paid at Nodin for a 1-hour session with a psychiatrist (\$250/hr vs \$200/hr), the vast majority of the decrease in the overall cost is in the outlay for transportation, food and accommodation that must be paid for the client and escort which is no longer paid.

The example of North Spirit Lake better illustrates how a videoconferencing consultation has only a minimal impact on the direct costs of a psychiatric consult while greatly reducing the indirect and secondary costs of providing such mental health care. The cost of providing telepsychiatric service to clients who remained in the community for the consultation was roughly \$1,575 per client, or 58% of the cost of sending the client to Sioux Lookout. The majority of this expense was the cost of bringing the mental health consultant from Sioux Lookout to North Spirit Lake to assist with the consultation.

The estimated cost of sending a client out of the community to receive mental health counseling is, in fact, an underestimate of the real cost to society since the opportunity costs to the client of income foregone and ensuring there is appropriate care for children or aged parents during the period the client is away from home are not factored into the calculation. Neither is the value added by the client/employee's productivity to an employer's enterprise, which is foregone during the same period. Nor is the value of the dedicated space allocated for the telepsychiatry sessions wherein, presumably, the teleconferencing suite is stored between session dates.

Table 2: Keewaytinook Okimakanak Mental Health Service				
Cost of Providing Psychiatric Mental Health Services to Remote Communities [See also Appendix I (ii)]				
Service Provision	Cost per Client-Session	Percent of NODIN Cost	Savings per Client	Percent Savings per Client
NODIN - Psychiatric Counseling Services	\$2,716	100%	\$0	0%
Telepsychiatry Pilot Project - Poplar Hill	\$1,934	71%	\$777	29%
Telepsychiatry Pilot Project - North Spirit Lake	\$1,575	58%	\$1,151	42%
On-going Telepsychiatry Programme - w/ MHC	\$985	36%	\$1,731	64%
On-going Telepsychiatry Programme - w/o MHC	\$710	26%	\$2,006	74%

These estimates do, however, include an annual depreciation factor (20%/an - as allowed on capital equipment by Canada Customs and Revenue) which was averaged over the potential number of sessions during the year (2 per month for 12 months). Also, for the purposes of the analysis, it was assumed that the ISDN lines set-up for the project were not used for any other videoconferencing, so the full expense of the installation and monthly line charges were fully applied to the project. Obviously, greater economies per session could be attained with an increase in the number of telepsychiatric sessions over the year and by sharing the monthly telecommunication line charges with other users in the communities (the Chief & Council, for example).

If an on-going programme of in-community telepsychiatric counseling was to be set-up (using Poplar Hill as an example), greater economies could be derived from appropriate planning and judicious scheduling. For example, since it is desirable that the medical health consultant is present during the telepsychiatric session, it would not be unreasonable to schedule the half day sessions during the cycle of 5-day visits when the consultant is in the community. Attending the telepsychiatric session would then become part of the week's activities and the indirect expenses of flight and accommodation, etcetera, could be rolled into the entire week's expenses. That is, one half day's share of the week's expense would amount to one-tenth of the total. Similarly, the annual depreciation allowed on the capital equipment would be divided among the (expected) eight visits during year. In that manner, the cost per telepsychiatric client-session could be reduced to \$985, or roughly 36% of the cost of sending the client out to see a psychiatrist at Sioux Lookout. The limiting factor then becomes the amount of time the psychiatrist would be prepared to dedicate to telepsychiatric sessions.

The abiding issue still remains: against whose discretionary spending budgets would the funds to be drawn in order to pay for the various components of an on-going service? A comparison of the budgets from which funds are drawn to pay for trips out of the community for psychiatric care and the budgets from which funds would be drawn to provide in-community telepsychiatric care reveals that, with no changes to the funding structure, the budgeting cost to each community Chief & Council's budget would more than double, from \$170 to \$580 per client-session (Table 3 and Appendices I (ii) & I (iii)). However, since much of the new budgeted expense would be the cost of bringing the mental health consultant to the community, judicious planning would permit a reallocation of already budgeted expenses and would mean a net increase in already committed resources of \$200 (118%) per client-session, largely to meet the capital depreciation expenses and telecom line charges.

Should the service organizers feel the tasks of the Mental Health Consultant (assessment, coordination and follow-up, etc.) could be reliably undertaken by the community's Mental Health Worker, the cost to the community could be \$305 per client-session, which would reflect the difference in the travel costs and fees paid to bring the Mental Health Consultant to the community. Additionally, by reallocating the portion of the already budgeted ongoing expenses associated with maintaining a Mental Health Worker in the community to the cost of a telepsychiatry session, the net increase to the community, in this instance, could amount to a net increase of as little as \$15 (9%) over-and-above the current cost of \$170 per client-session.

The greatest share of any savings would accrue to Health Canada - FNIHB (NIHB), largely in the form of funds not paid to local air passenger companies and to hotels and restaurants in Sioux Lookout. This amounts to 100% of their contribution to the cost of bringing a client out of the community for mental health care. Assuming that it would fall to the SLFNHA Client Services, through the Nodin Counseling Service Centre, to contract with the telepsychiatric service provider for services, they could expect a \$7 increase (2%) per client-session in the real cost of providing service compared with the current system.

Table 3: Keewaytinook Okimakanak Mental Health Service			
Shifts in Budget Expenses, per Client, in Providing Telepsychiatric Services to Remote Communities			
Service	First Nation Community Chief & Council	Health Canada FNIHB (NIHB)	SLFNHA Client Services
NODIN - Psychiatric Counseling Services	\$170	\$2,148	\$397
Ideal Telepsychiatry Programme - w/ MHC	\$580	\$0	\$404
Increase (Decrease) in Budget Expense [%]	\$410 [241%]	(\$2,148) [(100%)]	\$7 [2%]
Net Increase (Decrease) in Actual Expense [%]	\$200 [118%]	(\$2,148) [(100%)]	\$7 [2%]
Ideal Telepsychiatry Programme - w/o MHC	\$305	\$0	\$404
Increase (Decrease) in Budget Expense [%]	\$105 [34%]	(\$2,148) [(100%)]	\$7 [2%]
Net Increase (Decrease) in Actual Expense [%]	\$15 [9%]	(\$2,148) [(100%)]	\$7 [2%]

Given that, it will still cost just about \$1,000 per client to bring telepsychiatry to each Keewaytinook Okimakanak First Nation Community, and (assuming the co-operation of the psychiatrist involved and that there would be two or more clients seen every week, perhaps 100 to 150 clients per year in total, from all communities) a minimum overall cost of \$100,000 to \$150,000 per annum would be required to operate the programme. However, a preliminary assessment suggests that it would require an estimated \$59,500 expenditure in each community for start-up expenses (capital equipment, installation, monthly line fees and staff training) (Appendix I (iii)). The sum for a start-up of a dedicated telepsychiatry suite for each community, building on the existing equipment could cost in excess of \$240,000. Apart from the budget reallocation of the mental health consultant's time (about \$380 per session, or \$6,000 to \$10,000 per year, per community, or a maximum total of \$60,000 over the year), this is entirely new money.

A particular observation is offered here: Keewaytinook Okimakanak has a powerful resource in the form of the staff at K-Net Services, who have created and continue to maintain KO's presence on the cyber network. These people might well apply their skills to building and assembling some of the computer-based telecommunication components necessary for an on-going telepsychiatry program. Marshaling this capability could significantly reduce the potential capital requirements for such a program. However, in as much as the costs associated with computing technology and system development are ever-changing, they are therefore difficult to quantify. The exact value to the creation of a wide-spread telepsychiatry program of this resource would thus be difficult to assess. That being the case, the cost projections presented herein are founded upon the purchase of commercially available

equipment. However, significant additional savings might well be realized if the K-Net Services option was to prove fruitful.

Despite the potential savings of \$200,000 to \$300,000, each year, that could accrue to Health Canada - FNIHB (NIHB), which would off-set the majority of the start-up expenses, it is not immediately apparent that those funds would be made available for a telepsychiatry programme. It is also unclear, at this point, whether the cost could be borne by SLFNHA, outright or through Nodin; or whether each community would need to finance their portion of the programme start-up; or perhaps, some negotiated combination thereof. It is more likely that these resources will need to be new-found, not previously budgeted money, which may be available through a federally mandated granting or funding agency. While the proponents of a larger telepsychiatry programme should try to enter into discussions with existing stakeholders with the aim of negotiating a re-allocation of these resources, it may also be prudent to seek-out and secure special funding for this programme from entirely new sources.

5.8 Expanding Videoconferencing to Broaden Traditional Methods of Delivering Mental Health Care

The Keewaytinook Okimakanak Telepsychiatric Pilot Project has linked one psychiatrist with two communities. With suites of videoconferencing equipment set-up in each Northern Ontario First Nations community currently served by K-Net, it is conceivable that an expansion of the organization that created the pilot project could bring a spectrum of social and medical services to the north. A robust network could link these remote communities with the services of such highly specialized professionals as, for example, child psychiatrists, adult psychologists, registered marriage and family therapists.

With the caveat that videoconferencing is not an appropriate tool for all mental health conditions that present at community health clinics, it can be suggested that the services they could provide might include both individual and group consults, and the frequency of such consultations could be scheduled to optimize their effectiveness. Furthermore, the professionals need not be located in any particular facility, or community for that matter. It is conceivable that, subject to licencing regulations, specialists scattered across the province, the country or even the continent, might be contracted to provide tele-video services to remote First Nations communities. In this manner, an array of otherwise unavailable services could be made accessible to what, in effect, would be a consortium of northern communities which, individually, could never expect to overcome the economic barriers of meeting the client-population thresholds necessary to attract such services.

5.9 Summary

What has been described in this section amounts to a new mode of delivering mental health services to remote northern communities. It has been demonstrated that the cost of delivering this service as an ongoing programme, with 2 to 3 clients drawn from all of the Keewaytinook Okimakanak First Nations Communities being seen during weekly 1½-hour teleconferencing sessions, averaging 4 per month over 12 months, is estimated to be as much as \$985 per client-session (and potentially, even less). This estimate is significantly less than the overall cost of delivering this service by flying clients out to the regional First Nations counseling centre in Sioux Lookout, estimated to be \$2,716 per client-session in this study.

The cost of expanding the capital resources and technical capabilities, that were pulled together to operate the pilot project, to include the previously un-served Keewaytinook Okimakanak First Nations Communities in an ongoing telepsychiatry programme, the cost of would be in the range of \$59,500 per community, or a total potential outlay approaching \$240,000.

It must be clearly understood: telepsychiatry cannot replace face-to-face psychiatric care. However, it can supplement the more traditional modes of service delivery, and can provide an economical means to bring mental health services to clients in geographically remote locations. Logically, it would make sense to partner with Nodin in expanding the existing psychiatric services they now offer. This also presents the possibility of expanding the service to include other forms of tele-mental health. To do this will involve a re-configuration of the system to accommodate the technology, and re-orienting practitioners to appreciate its subtleties. It will also require both the commissioning of new funding streams to permit the establishment and expansion of the service. Not least, it will require effort on the part of legislators to create an appropriate governance and regulatory environments to encourage such a service to flourish.

6.0 Findings : Clinical Service

6.1 Usage

A total of 25 clients saw the psychiatrist via videoconferencing for a total of 40 sessions. From March 2000 to April 2001, 15 clients in Poplar Hill travelled to Red Lake for 18 sessions. In North Spirit Lake, 10 clients had 22 sessions during the months of January to March, 2001.

6.2 Chart review

A total of 15 client charts were available for data extraction and coding.

6.2.1 Profile of clients

There were five men and ten women in the sample of charts reviewed. Clients in the sample ranged in age from 14 to 58 years. The majority, 80% (n=12) were aged 26 or less. Figure 1 displays the distribution of ages. Of the sample, 40% had grade nine education, 20% had grade eight, and 13% had grade 10 and grade 5 levels, respectively. Slightly more than half were single (53%), while 40% were in common-law relationships.

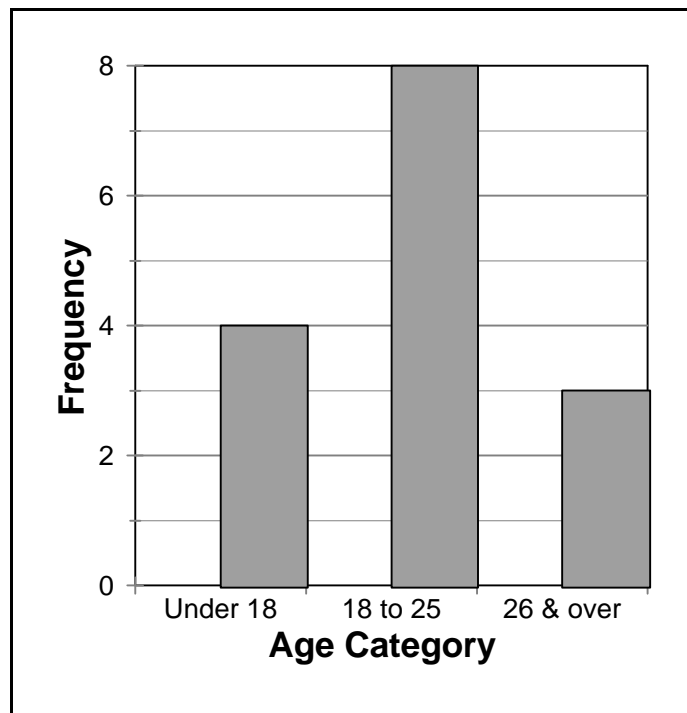


Figure 1: Age Distribution of Clients

Referrals to telepsychiatry came from four sources: (a) mental health consultant, (b) medical clinic, (c) self, and (d) doctor. The distribution of referrals from these sources appears in Figure 2.

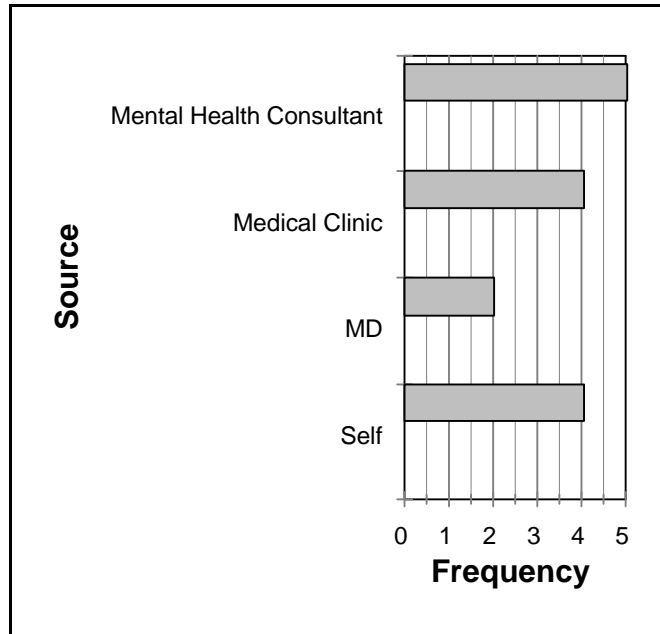


Figure 2: Sources of Referrals

6.2.2 Presenting Issues

In the client charts, the most common presenting mental health issues were:

- Suicidal ideation (66%, n=10)
- Complicated grief (53%, n=8)
- Substance abuse (53%, n=8)
- Depression (40%, n=7)
- Anxiety (40%, n=7)
- Anger (40%, n=7)

Other presenting issues were identified with much lower frequency:

- Physical illness (27%, n=4)
- Suicide attempts (20%, n=3)
- Psychosis,
personality disorder,
sexual dysfunction (13%, n=2, respectively)
- Lack of privacy,
isolation, overcrowding,
childhood sexual abuse,
developmental delay (7%, n=1, respectively)

Clients' histories highlighted the frequency and consequences of family relationship issues associated with suicide among family members and close friends, violence, sexual abuse and substance abuse, as well as the stress of mental and physical illness among family members.

The involvement of other mental health professionals prior to the consultation was recorded. There were previous consultations with a psychiatrist for 33.3% of the clients (n=5), inpatient psychiatric services for 26.7% (n=4) and residential substance abuse treatment for 13.3% (n=2).

6.2.3 Consultation Actions

The consultant's recommendations were reviewed and classified as follows: (a) social support, (b) community support, (c) counseling support, and (d) medication. The consultant most often recommended additional counseling for 80% of clients in the chart sample (n=12), followed in decreasing order of frequency by social (family) support for 46.7% (n=7), medication for 40% (n=6), and community support for 33.3% (n=5). The distribution of the consultant's recommendations is illustrated in Figure 3.

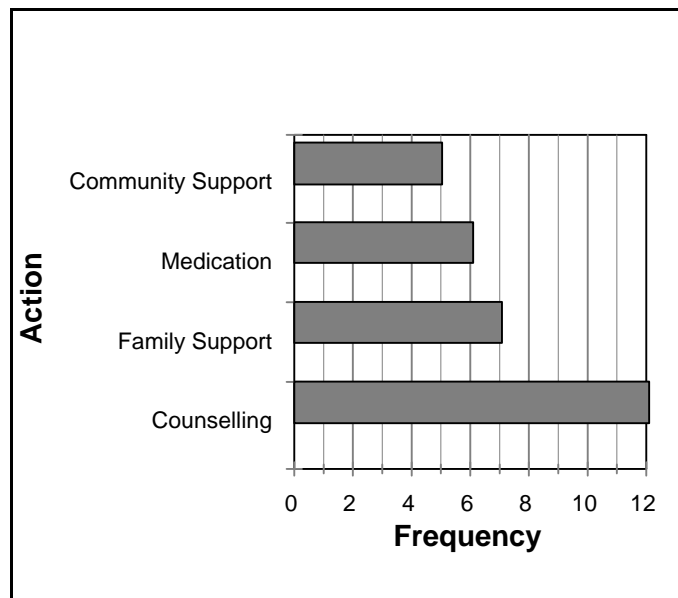


Figure 3: Recommendations

6.2.4 Client Perceptions

Clients were asked to complete a post-session questionnaire about their perceptions of the service. In September, 2001, clients were contacted to participate in a follow-up survey about their perceptions of the service and its impact.

6.3 Post-session questionnaire

A total of 20 questionnaires were completed by clients immediately after their first videoconferencing session with the psychiatrist. Of these, 14 respondents were from Poplar Hill, and 6 were from North Spirit Lake.

6.3.1 Preparation for the session

A series of orientation activities was conducted in Poplar Hill: a pamphlet distribution, a meeting with the consultant in the community, and a presentation by the consultant on the community radio. In North Spirit Lake, the Mental Health Worker prepared the community for the service using announcements and word-of-mouth. Respondents were asked to indicate how they knew what was going to happen in the telepsychiatric videoconferencing session, whether through the community orientation activities,

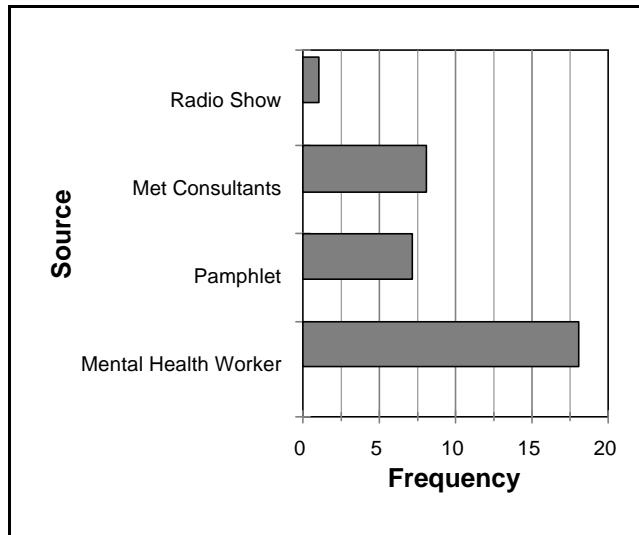


Figure 4: Source of Information

and/or from their Mental Health Worker. Figure 4 shows the distribution of sources of advance information about the video consultation. By far the most frequent way that respondents were prepared for the video consultation was by the Mental Health Worker (90%, n=18). Meeting the consultant and reading the pamphlet were reported less frequently, by 40% and 35% of respondents, respectively. Only one respondent reported hearing the consultant's radio show.

Respondents were asked if they knew what was going to happen during the videoconferencing session. Fully 85% of respondents (n=17) indicated that they knew.

The Mental Health Worker in the community is clearly the most important source for information about and preparation for telepsychiatry. Personal one-on-one contact appears to be essential to effectively prepare clients for their video session with the psychiatrist. Nonetheless, public information and orientation for the whole community is definitely a necessary component of the program: In North Spirit Lake, which did not receive the community orientation done in Poplar Hill, all respondents stated in some way that they wanted more information about the service; in contrast, only a few clients from Poplar Hill did so.

6.3.2 During the session

Respondents were asked to rate how nervous they were during the session, on a 3-point rating scale: "Yes, a lot", "A bit", or "No, not at all". The majority of respondents, 60%, indicated that felt nervous during the session, either "a bit" (40%) or a "a lot" (20%). Some respondents identified why they felt nervous during the session. Among the reasons

they mentioned were: not knowing what to expect; getting used to communication through videoconferencing; being alone in a room with the videoconferencing equipment; not being sure about what to say because English was a second language; and talking about one's problems. Clients who felt nervous during the session were asked what would make them less nervous in the future. The most frequent suggestion was more information about what to expect. A few mentioned having someone to support them present in the room during the session.

These suggestions were reinforced by the comments of those clients who reported that they were not nervous during the video session. The reasons that they gave were: knowing what to expect beforehand; being "*comfortable with the process and technology*"; being supported by the presence of the Coordinator, Mental Health Worker, interpreter, or relative in the room during the session. One respondent noted that having the psychiatrist on television made it "*...easier to have more distance*".

Although many respondents were nervous during their sessions, most (80%, n=16) said that they were comfortable with the psychiatrist asking personal questions through videoconferencing.

6.3.3 After the session

The majority of respondents (80%, n=16) indicated that their session was helpful.

Immediately after the session, clients were divided over confidentiality. While 55% (n=11) were not afraid confidentiality would be broken, 45% (n=9) were.

Being nervous during the session, or being concerned about confidentiality afterward, did not appear to be major problems. Immediately after the session, clients were highly positive about their experience. Almost all (95%, n=19) wanted to do it again, and would suggest to others that they try it. Their comments regarding the "best thing" about the session included:

- *Gave me good advice about working out my problem.*
- *Being in the community.*
- *Do not have to travel.*
- *There is no bad part.*

Clients' comments about the "worst thing" included:

- *Remembering the scary parts.*
- *No immediate summary of the doctor's recommendations.*
- *Unable to see the doctor in person.*

6.4 Follow-up survey

Because of an administrative error, different versions of the follow-up survey were sent to Poplar Hill and North Spirit Lake. Responses from both communities could only be compared for some questions. In Poplar Hill, a total of eight respondents participated in the survey. In North Spirit Lake, a total of five respondents were surveyed. In the opinion of the surveyors, the non-respondents were simply unavailable and not systematically different in any way from respondents.

All respondents remembered their video sessions with the psychiatrist. Respondents were asked what they thought about their sessions at the time. They were divided in how they remembered their experience. Six respondents remembered liking the experience at the time:

- *I liked seeing it and talking to her through video.*
- *It was better in Red Lake for one day than 5 days in Sioux Lookout.*

Seven respondents, including all from North Spirit Lake, stated having reservations about the experience at the time:

- *Not much*
- *A little wary.*
- *I didn't know what to expect.*

It may be that the difference in community preparation and orientation for telepsychiatry is one factor that might account for the apparent difference in immediate reactions to the sessions by clients from the two communities.

The telepsychiatry clients from Poplar Hill went to their sessions in Red Lake with an escort. All said that they liked having an escort (in North Spirit Lake, the videoconferencing equipment was on site). Some clients from Poplar Hill had an interpreter; and for some, the Coordinator was present during the session to provide explanation if needed. Most respondents from Poplar Hill reported that they understood what the psychiatrist said to them, although some said that they needed assistance with explanation, which they obtained from the Coordinator or the interpreter.

Respondents from Poplar Hill were asked if they felt comfortable during their sessions. Five said that they were comfortable; but three remembered being nervous, either because of the way they were feeling or the equipment. Poplar Hill respondents were also asked if they had enough time with the psychiatrist. Five respondents stated that they had enough time, but three wanted more time.

Almost all of these respondents indicated that their talk with the psychiatrist helped them mentally. Respondents from North Spirit Lake were asked how their sessions with the

psychiatrist affected them. All answered in some way that they had increased insight into their emotional issues.

Most respondents from Poplar Hill said that talking with the psychiatrist also helped their families. Respondents in North Spirit Lake were also asked about the effect of telepsychiatry on their families. In contrast to Poplar Hill, most respondents from North Spirit Lake indicated that their families were not helped, because of lack of understanding or not wanting to be involved.

At follow-up, all clients in Poplar Hill said that they felt safe about confidentiality. The consistency in response at follow-up may reflect a shift from responses immediately following the session, at which time almost half of respondents did not feel safe.

Respondents in Poplar Hill and North Spirit Lake were asked what they thought about tele-mental health generally at the time of follow up. Of all respondents from both communities, half stated that they wanted the service to continue. Others commented on the services as “*a new way to see the doctor*”, while a few didn’t know or wanted more information about the service (unspecified). Poplar Hill respondents were also asked what they thought about their talk with the psychiatrist at the time of follow-up. Most answered that they weren’t sure or didn’t know.

Almost all respondents in both communities said that they would tell people with problems who they care about to try the service.

Overall, the clients who participated in the follow-up survey expressed very positive views about the telepsychiatry service in terms of: getting help with their emotional problems; of being comfortable with the process; feeling safe about confidentiality; and, wanting the service to continue. Respondents were less certain about the long-term impact of the treatment they received, which is not surprising given that most saw the psychiatrist only once. Six months or longer after their sessions, respondents liked the service and wanted more of it.

6.5 Health Care Providers’ Perceptions

The analysis of the interviews with health care professionals and paraprofessionals revealed high consistency in their perceptions of the origins of mental health problems, the challenges of providing accessible, appropriate and effective mental health treatment, as well as the possibilities for, and effects of telepsychiatry. A summary of the main themes in the interviews follows.

6.5.1 Origins of Mental Health Problems in Northern First Nations

Recent history in Northern Ontario has brought about dramatic changes in livelihood, family functioning, and beliefs. The effects of these changes on contemporary living conditions give rise to cumulative traumatic consequences that result in mental health problems.

The traditional way of life for First Nations people was “*being on the land*”; hunting, trapping and fishing that followed the seasonal movements of the game. Families were close and children learned life skills, self-discipline, boundaries and self-respect from close ongoing contact with parents and community elders.

The advent of residential schooling led to children being taken away from their families. Residential schools and churches at the time viewed traditional practices and beliefs as evil and shameful. Traditional culture was suppressed and driven underground. Physical and sexual abuse was common. Children who were sent to residential schools often felt disconnected from their families even when they returned to them: “*Not the same going back to the family after.*” They also experienced themselves as outsiders both in their own communities and in ‘mainstream’ society.

The long term consequences of residential schooling have been extensive and reverberate into the present. Starting with a breakdown of the traditional family system, many who went to residential schools carry wounds from the past which are passed on their children and grandchildren through difficulties in dealing with emotional problems, and reduced parenting skills. Young people may experience lack of support from parents, and turn to drugs and alcohol for comfort. As a result, people may internalize external social and economic problems.

During the 1960s, residential schools were followed by settlement in permanent reserve communities, with overcrowded housing lack of amenities and few jobs. Living under these conditions can perpetuate a sense of hopelessness, powerlessness and passivity. In recent years, material living conditions have improved dramatically with better housing, electricity, running water, sanitation and other infrastructure that are being built up through the tribal councils.

Originally part of the nearby Pikangikum First Nation community, the Poplar Hill became recognized as an independent First Nation in 1978. Because it was established long after forced residential schooling had ended, this community’s children were not directly affected by it. However, community members do identify lack of parenting and alcohol abuse as current issues associated with mental health problems.

Initially, the people of Poplar Hill had been actively involved in traditional spirituality. Christian missionaries arriving after the Second World War taught people their beliefs were

wrong. This was followed by a period of spiritual vacuum, during which there was considerable alcohol abuse. In recent years, the community has adapted a practice of Christianity that accepts traditional culture and practices.

The nature of the work that is available in the expanding modern economy often conflicts with traditional family contact by coming between parents and children, and by further reducing traditional closeness, communication and learning. Children who used to look up to parents and learn from them may be exposed to alcoholism and dysfunction. They communicate less with their parents and have less structure in their lives. With little interest in traditional culture, children are more attracted to media images, computers and video games, with messages of empowerment that contrast with their daily experience. School also conflicts with traditional living and can pull families apart. As a result, children find themselves caught between traditional and 'modern' worlds, without a voice.

At the same time, there are also areas of significant strength, resiliency, pride and hope in the communities: the central importance of and commitment to the family, roots and the preservation of traditional practices, speaking the native language, people helping each other, hopes for children, and the improvements in infrastructure. There is a strong network of informal and formal supports, which is maintained whether or not professional services are available.

Living conditions combine with childhood antecedents, grief from the suicides of family members and friends, and relationship difficulties to result in mental health problems. People often present with several problems. Suicidal thinking is prevalent, even among children. Many reasons underlie suicidal thinking: a cry for help, anger, the example of others. Sometimes, the reasons remain unknown, leaving survivors to wonder why.

Prior to telepsychiatry, the only source for mental health treatment was Nodin Counseling Services in Sioux Lookout. People in remote communities were often reluctant to travel, were concerned about being comfortable and trusting someone they didn't know, and there was a high rate of refusals and no shows. This has resulted in low use of these mental health services by members of the Poplar Hill community. Nonetheless, huge demand for Nodin's services and a ceiling on funding have required that the agency focus on crisis counseling. This has made it difficult for Nodin to retain its previous levels of activity in its other services: specialty clinics, crisis coordination, and training and community development.

Needs remain for continuity and follow-up in services, more specialized services such as child and adolescent psychiatry, networking among professionals and community health workers, and for more local flexibility in control over services.

6.6 Operation of The Telepsychiatry Pilot Project

6.6.1 Orientation

In response to concerns expressed by people in Poplar Hill about travel and confidentiality, a series of orientation activities was planned and implemented in that community. Central to these activities was a visit to the community by the psychiatrist. People had the opportunity to meet her, and she was able to communicate messages about the service, namely that people are not crazy if they have to see a psychiatrist, and that antidepressants are not ‘crazy pills’ or addictive.

6.6.2 The Consultation Session

Video quality could use improvement in sharpness and resolution. The mutual gaze requirements of interaction through videoconferencing can be tiring on the eyes because of having to stare constantly at a face on the screen. Audio quality was acceptable, although the sound delay was long enough to result in over-talking. Also, sound pickup was a problem with the existing microphone when people looked down from the camera.

Overall, the emotional connection between the psychiatrist and clients through videoconferencing was “*fairly good*”, but the low level of video resolution, a bandwidth of 384 kilobytes per second (kbs), could result in “*total empathic failure*” when a client was crying because it was hard to detect. The technology imposed emotional distance, which allowed clients to be less embarrassed and more comfortable during the session. However, this distance made the psychiatrist’s work harder: “*You get the job done, but in a different way.*”

Consultation by videoconferencing allowed for improved therapeutic rapport because of the possibility of seeing the same psychiatrist over multiple sessions. The psychiatrist could make a treatment plan with the client and follow up on it. This in turn speeded up assessment and reassessment. Opportunities for increased follow-up and continuity were seen as important benefits of the service. In Poplar Hill, continuity and follow-up did not meet expectations because of high turnover among mental health workers during the operation of the pilot project.

6.6.3 Communication

As a new mode of service delivery, videoconferencing provided new and different forms of communication, not only between the psychiatrist and clients, but also between the psychiatrist and mental health professionals and paraprofessionals in the community.

The coordinator sent a summary on each referred client to the psychiatrist. The coordinator and the psychiatrist also discussed the client before a session. After the session, the psychiatrist sent a note to the client's family doctor if a prescription was required, as it was not possible to prescribe without seeing the client face-to-face. The psychiatrist also sent notes and recommendations back to the nursing station in the community. All participants highly valued these communications. They also agreed that communication between the psychiatrist, coordinator and mental health worker could be difficult, with delays in receiving medication orders and session notes. However, the specialized technical language of psychiatry could be difficult for lay-health workers in the community. Participants expected these problems to be smoothed out with more experience in the future.

Telepsychiatry also allowed for supporting health workers in the community through education, training and ongoing dialogue between mental health workers and the psychiatrist. All participants agreed on the benefits of these new opportunities.

6.6.4 Impact of the Consultations

Service was delayed by two months as a result of suicides in the community, which also emphasized the need for increased access to mental health services.

Health care providers who directly worked with the telepsychiatry pilot project reported that it freed them up to be more flexible in doing their work. They believed that the organization of the service used for the pilot project could become more flexible with additional experience, such as by having mental health workers or NNADAP workers contact the psychiatrist directly.

Participants agreed on the benefits they observed for clients in the community. People wanted to try the service, and this was confirmed by the absence of refusals. Clients understood the concept of confidential communication by videoconferencing and were cooperative with the process. They bonded with the psychiatrist. Those who had follow-up worked on their issues, showed commitment to the process and came to their sessions. Community mental health workers noted that people were asking when the service would be available again.

6.7 Summary

Mental health problems in remote First Nations communities are the direct and indirect result of conditions arising from history. Existing mental health services must be limited to crisis intervention, are available mainly outside of the community, are hard to access, and have limited continuity and follow-up. Telepsychiatry provides hope by increasing flexibility for health care providers through easing access, increased continuity and follow up, increased

support for health workers in the community. Clients want the service and are comfortable with it.

Overall, health care providers saw the Telepsychiatry Pilot Project as beneficial to clients, to the organization of health service delivery and to communities. They did not expect telepsychiatry to have major impact on social and structural problems, but they saw the service as new, exciting, and importantly as providing a sense of hope.

7.0 Conclusions

7.1 Cost Effectiveness

7.1.1 The Current System of Mental Health Care Delivery (Appendix I (i))

- 1.1 Currently, the cost of providing a client from a remote First Nations community in Northwestern Ontario (Poplar Hill) with a 1-hour counseling session with a psychiatrist at the Nodin Counseling Service Centre, in Sioux Lookout, is \$2,716.
- 1.2 The largest single expense in providing this service is the cost of travel and accommodation for the client and escort, \$2,049, which is funded through Health Canada - First Nations and Inuit Health Branch (Non-Insured Health Benefits).
- 1.3 The next most expensive cost is for the service, itself, and incidental overhead expenses, \$497, which is borne by the Sioux Lookout First Nations Health Authority, which funds the Nodin Centre (SLFNHA).
- 1.4 The remaining cost, \$170, is borne by the client's First Nations Community.
- 1.5 The usual time-commitment required from the client (and escort) to obtain a 1-hour session with a psychiatrist at Nodin is 36 hours (i.e., 2 days and 1 night).
- 1.6 If the service is provided by a First Nations mental health worker, it could involve a series of 1 to 1½-hour sessions over a period of 4 days, the total cost of which could amount to \$4,078.
- 1.7 The largest portion of this expense, \$2,545, is for travel and accommodation, and is borne by Health Canada - FNIHB (NIHB).
- 1.8 The SLFNHA portion of this expense is \$1,362, and the Community's share remains at \$170.

Note 1: The opportunity cost to the client, and to the escort, of being away from the community for 2 to 4 days has not been taken into consideration. Nor has the income foregone from employment lost by the client and/or the escort, during the absence. Neither has the value-added to their employers by their employment been considered.

7.1.2 The Keewatinook Okimakanak Telepsychiatry Project (Appendix I (ii))

Note 2: Because installation of the requisite telecommunication technology to the participating communities was delayed, the Keewatinook Okimakanak Telepsychiatry Pilot Project had two configurations: Poplar Hill, for which clients were flown-out to Red Lake, where videoconferencing equipment had been installed; and, North Spirit Lake, for which the telecom links were available in the community during the last three months of the project.

- 2.1 The cost of using videoconferencing technology to provide psychiatric counseling to clients from Poplar Hill through the Keewatinook Okimakanak Telepsychiatry Pilot Project was \$1,934 per 1½-hour client-session.
- 2.2 The largest portion of this expense, \$1,158, was the cost of the telepsychiatric client-session itself. This included \$637 for the pro-rated professional fees of the psychiatrist and mental health co-ordinator; \$253, for travel and incidental expenses for the mental health co-ordinator; \$138 for the pro-rated annual depreciation of the equipment in Poplar Hill and Winnipeg; and \$130 for the telecom link. This was borne by the Keewatinook Okimakanak Tribal Council from the project funding envelope.
- 2.3 Travel and expenses for the client and escort, \$652, was the second largest expense and was funded by Health Canada - FNIHB (NIHB).
- 2.4 The remaining \$123 was the cost of referral assessment, administration and travel within the community, which was paid by Poplar Hill First Nations under a mental health service agreement with the consultant/co-ordinator.
- 2.5 The cost of using videoconferencing technology to provide psychiatric counseling to clients in North Spirit Lake, through the Keewatinook Okimakanak Telepsychiatry Pilot Project, was \$1,565 per 1½-hour client-session.
- 2.6 The largest portion of this expense, \$1,453, was the cost of the telepsychiatric client-session. This included \$637 for the pro-rated professional fees of the psychiatrist and mental health co-ordinator; \$390 for travel and incidental expenses for the mental health co-ordinator; \$294 for the pro-rated annual depreciation of the equipment in North Spirit Lake and Winnipeg; and \$130 for the telecom link. This was borne by the Keewatinook Okimakanak Tribal Council from the project funding envelope.
- 2.7 The remaining \$112 was the cost of referral assessment, administration and travel within the community, which was paid by North Spirit Lake First Nations under a mental health service agreement with the consultant/co-ordinator.

7.1.3 Telepsychiatry as It Might be Provided (Appendix I (iii))

Note 3: Using the Keewaytinook Okimakanak Telepsychiatry Pilot Project as a model, a theoretically viable telepsychiatry program was designed that would provide a videoconferencing suite in each of the six Keewaytinook Okimakanak First Nations communities and link them to one psychiatrist. It was estimated that there would be four 3-hour sessions per month divided among the communities, as needed. This model assumes funding for the professional fees of the psychiatrist would be a budgeted expense financed by the Sioux Lookout First Nations Health Authority and administered through the Nodin Counseling Service Centre. The professional fees and expenses of the mental health consultant would be borne by the First Nations community.

- 3.1 The cost of using videoconferencing technology to provide psychiatric counselling to clients from any given Keewaytinook Okimakanak community, through an ongoing telepsychiatry programme, would be \$985 per 1½-hour client-session.
- 3.2 The largest portion of this expense, \$580, would be the cost of the telepsychiatric client-session, itself, including the cost of the referral assessment, a half-day share of the cost of bringing the mental health co-ordinator/ consultant to the community, the pro-rated depreciation on the capital equipment and a share of the telecom line charges. (Much of this expense is already borne by the community and, largely, would involve a re-allocation of already budgeted resources. See conclusion 4.3.) However, should the service organizers feel the tasks of the Mental Health Consultant (assessment, co-ordination and follow-up, etc.) could be reliably undertaken by the community's Mental Health Worker, the cost to the community could be as little as \$305 per client-session.
- 3.3 The remaining expenditure, \$404, would go towards the psychiatrist's professional fees and the depreciation of the videoconferencing suite at that end. This would be borne by the SLFNHA Client Services, either directly or through a special budget envelope administered through Nodin.
- 3.4 While the hourly rate charged by the telepsychiatrist is 25% more for each 1½-hour session within the 3-hour session block than is paid at Nodin for a 1 to 1½-hour session with a psychiatrist (\$250/hr vs \$200/hr), the vast majority of the decrease in the overall cost is in the outlay for transportation, food and accommodation that must be paid for the client and escort which is no longer paid

7.1.4 Cost Savings and Transfers of Economic Burden

- 4.1 The greatest savings to accrue from a telepsychiatric programme, in the amount of \$2,149 per client-session under the assumptions outlined, would go to Health Canada - FNIHB (NIHB). This amounts to their entire per-client commitment to providing mental health services to northern First Nations communities.
- 4.2 SLFNHA Client Services could expect to fund an additional \$7 per client-session.
- 4.3 A First Nations community (such as Poplar Hill) could expect to commit an additional \$200 per client-session in order to support an on-going telepsychiatry programme if it was deemed necessary to continue to rely upon the services of a Mental Health Consultant. While the per client-session cost would be as much as \$410 above current outlays, as much as half of this (\$210) could be resources re-allocated from existing mental health care budget envelopes. If, however, the community was to rely upon the services of a Mental Health Worker, resident in the community, the additional cost could be a little as \$15 per client-session. In such an instance, the increase in the overall cost to the community would be \$105 per client-session. However, it is estimated that about \$90 worth of this would represent the re-allocation of the MHW's time, and thus could, again, be drawn against funds already budgeted.

7.1.5 The Cost of Setting-up a Comparable Telepsychiatry Programme

- 5.1 It is important to recognize that computing costs and technology capabilities are ever-changing, and are therefore difficult to quantify. With that said, building on existing equipment and expertise, start-up costs could be as much as \$240,000 overall, or \$59,500 per community, for capital equipment, installation, specialized ISDN telecommunication links and training, to bring telepsychiatry to the remaining Keewaytinook Okimakanak communities.
- 5.2 The telepsychiatry pilot project demonstrated that the cost of acquiring the necessary video conferencing equipment, its installation, as well as the expenses for technical staff and for training of the community mental health support staff would total just over \$59,500 per site. Of that, \$42,417 would be for capital equipment, outright; about \$8,640 for specialized ISDN telecommunication line installations and monthly line charges; with about \$5,000 allocated to bring the mental health consultant and community mental health workers out for training on the equipment.
- 5.3 A further cost of \$59,500 could be expected if Nodin was to purchase a videoconferencing suite, as well, in order to provide tele-counselling service.

- 5.4 These resources could be recouped in one year from the \$2,148 per client-session (potentially, \$200,000 to \$300,000 per annum) no longer required from Health Canada - FNIHB (NIHB). (It is probable, however, that decision-makers within NIHB would be unlikely to make those funds readily available for such a programme.)
- 5.5 Additionally, [as noted in 4.3] if it is deemed necessary to continue with the services of a Mental Health Consultant, an increase in (hard-cost) annual funding of just over \$200 per client-session (or \$15,000 to \$30,000 per year) could be needed in the overall amount of resources required to provide mental health care for 75 to 150 clients from remote Northwestern Ontario First Nations communities.
- 5.6 Keewaytinook Okimakanak has access to a very powerful resource in the form of K-Net Services. It has not been possible, herein, to fully address the potential value of K-Net Services to the creation of a telepsychiatry program. The enthusiasm and collective talent of the pool of individuals who have worked to build and maintain K-O's cyber presence is almost infectious. They are quite capable of applying their considerable entrepreneurial skills to the design and acquisition of some of the necessary computer and telecommunication components that will be required by a full telepsychiatry program. Drawing upon this resource could potentially reduce capital costs significantly, and Keewaytinook Okimakanak would be wise to enlist the services of these forward-thinking people - to the fullest.

7.1.6 Which System Offers the Best Cost Effectiveness?

- 6.1 Considering all stakeholders and the entire system necessary to bring mental health counseling to remote Northwestern Ontario First Nations communities, an on-going programme of telepsychiatry is the most cost effective means to deliver the service.
- 6.2 A mental health counseling delivery system reconfigured to include telepsychiatry would channel about \$200,000 to \$300,000 of expenditures away from discretionary local spending by Health Canada - FNIHB (NIHB), which has been largely to regional air transportation passenger carriers, hotels and restaurants; and largely towards a recurring (every 5 years, or so) out-of-region expenditure to videoconferencing equipment manufacturers and suppliers from the south. At this point, it is uncertain who would make this expenditure; presumably, it could be Health Canada - FNIHB, Program Policy, Transfer Secretariat and Planning (Health Funding Arrangements Division).
- 6.3 Using a 3½-times multiplier effect, this could have as much as a \$1,000,000 detrimental effect on the local service economy. (In the grand scheme, this is not very significant, even locally.)

7.2 Clinical Service

The findings of the clinical service evaluation lead to the following conclusions:

1. Both clients and health care providers liked the service and wanted more of it.
2. The service was used by people in need who would otherwise have had little or no access to specialized mental health assessment and treatment.
3. Both clients and health care providers liked the increased availability of mental health services in the community, without a requirement for travel.
4. Clients demonstrated perfect attendance and expressed consistently positive perceptions of the confidentiality and benefits of the service, which were maintained over time.
5. The distance of the psychiatrists during videoconferencing helped some clients with painful, long-standing emotional problems to feel more comfortable in the therapeutic interaction than they would have face-to-face. Tele-mental health challenges assumptions about what heals by providing an alternative to people for whom conventional treatments are not appropriate.
6. Picture and sound quality were acceptable but could be improved.
7. Post-video session documentation routing (e.g., notes, reports, and medication orders) could be unpredictable and slow.
8. Health care professionals and paraprofessionals reported increased continuity and coordination of care for clients and increased flexibility in their work.
9. Front-line workers in the communities reported reduced isolation and increased support in their work.
10. The service responded to significant mental health problems in the community.
11. Extensive community orientation to the service contributed to the successful introduction of the service.
12. High degrees of service effectiveness for all intended uses were achieved.
13. The pilot project was successful, in part, because its organization and delivery responded to local needs and used a personal approach.

14. The skill and experience of the psychiatric consultant and the mental health coordinator were also important to the success of the project. The opportunity to meet the consultant in the community helped clients to be comfortable with the service.
15. The success of the service was facilitated by broader technological changes that have made computers more accessible and attractive to community members.
16. Local control of new technology such as videoconferencing may support traditional communities in preserving their culture and heritage.
17. No tool, including tele-mental health should be expected to reduce the underlying systemic causes of mental health problems in remote Northern communities.
18. A significant unanticipated consequence of the pilot project was a sense of hope among clients and service providers.
19. Videoconferencing is a useful tool for increasing access to services, increasing the coordination and integration of services, improving follow-up and saving money.
20. The pilot project was successful in attaining its goals of increasing access to professional services for isolated communities; and minimizing disruption to clients and enhancing the capabilities of community support workers to care for clients in their communities.
21. Finally, the enthusiasm with which telepsychiatry and other high tech initiatives have been embraced suggests that it may be possible for First Nations communities to use the best of the modern world as a way of preserving their traditional culture and heritage.

8.0 Recommendations

Conclusions drawn from the evaluation have lead to the following recommendations:

8.1 Cost Effectiveness

- 1.1 **Undertake an on-going telepsychiatric programme with caution.** While there are significant economies to be gained, overall, an on-going program of telepsychiatric care would also induce significant transfers of economic burden across stakeholders within the First Nations mental health care system; most notably, from Health Canada FNIHB (NIHB) to Keewaytinook Okimakanak First Nations communities. However, in the final analysis, without a more accessible cost-effective and time-efficient mental health care system, it is the current and future First Nations clients who will pay the greatest cost.
- 1.2 **Enter into negotiations with Health Canada - FNIHB, perhaps through Program Policy, Transfer Secretariat and Planning (Health Funding Arrangements Division) to access a portion of the savings** that will accrue to the Non-Insured Health Benefits division as a result of an on-going telepsychiatry programme.
- 1.3 **Seek-out new funding sources to support the purchase of capital equipment requirements.** From the point of view of the First Nations communities, external resources not forthcoming, it would be difficult to justify a telepsychiatric programme, as described, as more economically feasible than existing modes of delivery. (It is the individuals and communities involved who must place a value on the time and out-of-pocket commitments required of clients and escorts.)
- 1.4 **Draw upon the expertise and broad-based capabilities of K-Net Services staff** in the design, development and acquisition of telepsychiatry computing and teleconferencing equipment.
- 1.5 **Broaden the use of videoconferencing equipment to include other telehealth and community-based programs** as a means to fold-in services and share costs among other community videoconferencing users.

8.2 Usability

- 2.1 **Increase the rate of data transmission** for a sharper picture to better communicate interactional information in the therapeutic relationship.

- 2.2 **Use an ‘omnidirectional’ or lapel microphone for clients** to reduce variations in signal volume and clarity that result from head movements.

8.3 Clinical Service

- 3.1 **Add the chart review form from the evaluation, or an adaptation thereof, to clinical record keeping.**
- 3.1 **Plan for rapid post-video session turnaround of notes, recommendations and medication orders.**
- 3.2 **Increase the range of mental health services for children available through videoconferencing.**
- 3.3 **Expand the use of the telepsychiatry service as support and training for community mental health workers.**
- 3.4 **Broaden the scope of tele-mental health services and the selection of providers to include social workers, family counsellors, psychologists, spiritual counsellors and traditional healing, and others** who can be drawn upon from across the region and the province to lend their expertise to mental health care in remote First Nations communities.

8.4 Evaluation

- 4.1 For the purposes of planning future services, **evaluate new telepsychiatry services**, using a program logic model for planning.
- 4.2 **Assess the usefulness of standardized questionnaires** (e.g.: rapid assessment inventories) for measuring client progress.
- 4.3 **Revise the referral and client post-session questionnaires**, and add rating scales to the latter.

8.5 Infrastructure & Organization

- 5.1 **Continue to build on existing local initiative, practical knowledge and extensive community participation** to respond to local and regional needs when planning future tele-mental health services.
- 5.2 When introducing telepsychiatry to other communities, **continue to plan for extensive orientation activities**, such as pamphlets, demonstration interviews and opportunities to meet the service providers face-to-face.
- 5.3 **Ensure that mental health workers in the communities complete the necessary training to operate videoconferencing equipment.**
- 5.4 **Ensure that mental health workers in the communities are given the responsibility and granted the requisite authority to schedule appointments.**
- 5.5 Invite Nodin Counseling Services to collaborate in planning future tele-mental health services.

APPENDICES

APPENDIX A :	Letter of Invitation	77
APPENDIX B :	Telepsychiatry Project Questionnaire	79
APPENDIX C (i) :	Client Follow-up Survey - Poplar Hill	81
APPENDIX C (ii) :	Client Follow-up Survey - North Spirit Lake	83
APPENDIX D :	Consent to Participate Form	85
APPENDIX E :	Oath of Confidentiality Form	87
APPENDIX F :	Information Regarding the Study (for Clients)	89
APPENDIX G :	Research Consent Form	91
APPENDIX H :	Information Regarding the Study (for healthcare providers and community members)	95
APPENDIX I (i) :	Chronology and Cost of Mental Health Service Provision: Service to Remote Communities without Telepsychiatry	97
APPENDIX I (ii) :	Chronology and Cost of Mental Health Service Provision Service to Remote Communities - Telepsychiatry Pilot Project	99
APPENDIX I (iii) :	Chronology and Cost of Mental Health Service Provision Service to Remote Communities - On-Going Telepsychiatry Programme	103

APPENDIX A

Letter of Invitation

Administration Office
Fort Severn First Nation
Fort Severn, Ontario
POV 1W0

Ph: 1-807-478-1114
Fx: 1-807-478-1103



Sub-Office
Mine Road
P.O. Box 340
Balmertown, Ontario
POV 1C0

Ph: 1-807-735-1381
Toll Free: 1-800-387-3740
Fx: 1-807-735-1383
Website: www.knet.on.ca

P·ᐅᐅᐅ' ᐅᐅᐅᐅ'

August 13, 2001

Dr. Christian Keresztes, Research Associate
Health Research Group
Queen's University
Kingston, ON
K76 3N6

Dear Dr. Keresztes:

We are pleased to invite you and Ralph Shaw to serve as Evaluators for the Telepsychiatry pilot project for Poplar Hill and North Spirit Lake First Nations, which was carried out between April 2000 and March 2001.

As you know, this Tribal Council has sponsored these projects on behalf of these communities and this evaluation is being carried out with their full support. The Tribal Council and it's staff are ensuring that all aspects of patient confidentiality will be protected in this evaluation through adherence to the appropriate protocols.

We confirm our request for you and Dr. Shaw to travel to Poplar Hill during the week of September 4th for which arrangements are in the process of being made.

We are pleased with the progress we have made so far in which you have facilitated our completing as much as the work that is possible ourselves.

We look forward to your trip.

Yours truly,

for: Orpah McKenzie, HBScN, RN
Director of Health Services

Keewaywin	Poplar Hill	Deer Lake
Fort Severn	North Spirit Lake	McDowell Lake

APPENDIX C (i)

Keewaytinook Okimakanak Telepsychiatry Pilot Project Evaluation

CLIENT FOLLOW-UP SURVEY (Poplar Hill)

1. Do you remember your visit to the Northern Chiefs office to see and talk to Dr. Edye through video?
2. What did you think about it at the time?
3. Did you like having an escort or not?
4. Did you have an interpreter or not?
5. Did you feel safe about confidentiality or not?
6. Did you have enough time with Dr. Edye?
7. Did you feel comfortable or not?
8. Did you understand or not what Dr. Edye said to you?
9. Did your talk with Dr. Edye help you mentally or not?
10. Did your talk with Dr. Edye help your family or not?
11. What do you think about tele-mental health now?
12. What do you think about your talk with Dr. Edye now?
13. If someone you care about has problems, would you tell them to try this?

APPENDIX C (ii)

Keewaytinook Okimakanak Northern Chiefs Council

Tele-Psychiatry Follow-up Questionnaire (North Spirit Lake)

1. Do you remember your visit to the Northern Chiefs office in the (Spring / Summer / Fall / Winter) to see and talk to Dr. Edye through video?
Response:

2. What did she say to you?
Response:

3. What did you think about it at the time?
Response:

4. What do you think about it now?
Response:

5. How did your talk with Dr. Edye affect you?
Response:

6. How did your talk with Dr. Edye affect your family?
Response:

7. If someone you care about has problems, would you tell them to try this?
Response:

APPENDIX D

Consent to Participate

Telepsychiatry

I _____ of Poplar Hill First Nation agree to participate in the Keewaytinook Okimakanak Telepsychiatry Project on _____, 2000 in Red Lake. I understand that:

1. Only those I see have access to the knowledge about me,
2. This session will not be taped and is not shown on public TV.

I agree to provide to the Brighter Futures Coordinator my honest opinion about what I think of this project including any complaints as well as things that I like about the project. I will also attempt to make suggestions for its improvement.

Signed

Date

APPENDIX E

Oath of Confidentiality

Telepsychiatry

I _____, _____ (position - technician, escort) will keep confidential any information that I hear at the telepsychiatry session to be held on _____, 2000, with _____ (client).

I understand that this means that I will not talk about anything the client talked about to anyone, including my spouse.

I understand that if I break confidentiality, that I will be in danger of losing my job.

Signed

Worker

Client

Witness

Date

APPENDIX F

Information Regarding the Study Entitled:

Evaluation of the Keewaytinook Okimakanak Telepsychiatry Pilot Project

Principal Investigator: Christian Keresztes, PhD, CPsych
Research Associate
Queen's Health Policy
Queen's University, Kingston, ON K7L 3N6
Tel.: (613) 533-6000 ext. 74630

Description of the Project

Videoconferencing is a relatively new way to deliver medical services.

Dr. Christian Keresztes and his colleagues are conducting a study for Keewaytinook Okimakanak First Nations Council to assess the quality and the results of services offered by the Telepsychiatry Pilot Project. From the results of the study, we hope to identify the benefits and risks, if any, of videoconferencing as a way of providing consultation, and to provide information that will assist Keewaytinook Okimakanak Health Services in improving its telepsychiatry service.

Clients who used the Telepsychiatry Pilot Project are invited to participate in this research study. Participation is voluntary. You will receive the same services from Keewaytinook Okimakanak whether or not you take part in the research.

Participants in the evaluation will be asked to complete a survey on their experience of, and satisfaction with the video consultation that they took part in. Data on the participants' history will be collected from medical and administrative records of the consultation session.

There are no known harms associated with your participation in this research. However, there may be harms we don't yet know about. You will not benefit directly from participation in this research.

Confidentiality will be respected. No information that discloses your identity will be released or published without your specific consent. Only anonymous data will be analysed and reported.

Thank you for considering participation in this study.

Christian Keresztes, PhD, CPsych

APPENDIX G

Research Consent Form

Title of Research Study

Evaluation of Keewaytinook Okimakanak Telepsychiatry Pilot Project

Researchers

Co-Principal Investigator: Christian Keresztes, PhD, Cpsych,
Research Associate

Co-Principle Investigator: Ralph Shaw, MA,
Research Associate

Address: Queen's Health Policy Research Unit
Abramsky Hall, 3rd Floor
Queen's University,
Kingston ON K7L 3N6
Tel: 1 613 533 6387

Purpose of the Research

The purpose of the evaluation research is to assess the quality of services offered by the Telepsychiatry Pilot Project, and to assess the benefits and risks of this service to referred clients. The results of the evaluation will inform efforts by Keewaytinook Okimakanak Health Services to improve the quality of its telepsychiatry service.

Sponsor

The Queen's Health Policy Research Unit is conducting the evaluation research under contract to Keewaytinook Okimakanak Health Services (sponsor), which received funding to operate the Telepsychiatry Pilot Project from the Medical Services Branch of Health Canada.

Description of the Research

You are being invited to participate in an evaluation of the Telepsychiatry Network, conducted by Dr. Christian Keresztes and Mr. Ralph Shaw (Queen's Health Policy Research Unit).

Participating in the research will involve:

- 3.1 **Client follow up survey:** you will be asked to complete a survey about your experience of, and satisfaction with, the video consultation session that you took part in. This questionnaire will take about ten minutes to fill out.
- 3.2 **Clinical information about your consultation:** Selected data will be extracted from the medical and administrative records of your consultation, pertaining to your history, the consultation, and its follow-up.

Potential Harms

There are no known harms associated with videoconferencing or with your participation in this research. While there may be harms that we have not been able to identify so far, the researchers and Keewaytinook Okimakanak Health Services will remain vigilant to identify them and act accordingly.

Potential Benefits

There are no known benefits to you associated with participation in this research. Your participation may have potential benefit to future clients. By studying a large number of people who used the Telepsychiatry Pilot Project, we hope to identify improvements to the quality of future telepsychiatry services offered by Keewaytinook Okimakanak First Nations Council.

Confidentiality

Confidentiality will be respected. No information that discloses your identity will be released or published without your specific consent to the disclosure. Only anonymous grouped data will be analysed and reported.

The Queen's Health Policy Research Unit will ensure that all personally-identifying information is confidential and secure. All personal health information will be kept in a locked cabinet and in a private computer file on a secure server at Queen's University. Only the researchers will have access to this information, which will be used only for the purpose of the research identified above.

Voluntary Participation

Your participation is voluntary and you have the right to refuse to participate in the evaluation research. Your decision about whether or not to participate in the evaluation research will not affect the service that you receive, either now or in the future, should you require service again. You will receive the same services whether or not you take part in the research. Should you consent to participate in the research, you can withdraw at any time.

Consent

I acknowledge that:

1. the research procedures described above have been explained to me.
2. any questions that I have asked have been answered to my satisfaction.
3. I have been informed of the alternatives to participation in this study, including the right not to participate and the right to withdraw without compromising the quality of medical service at Keewatinook Okimakanak First Nations Council.
4. the potential harms and discomforts of participating in the research study have been explained to me.
5. I understand the benefits of participating in the research study.
6. I know that now or in the future I may ask any questions I have about the study or the research procedures.
7. I have been assured that records relating to my care will be kept confidential and that no information will be released or printed that would disclose personal identity, unless required by law.
8. I will receive a copy of this consent form for my information.
9. I understand that by consenting to participate in this research, I am not waiving any of my legal rights nor are the researchers released from any of their legal obligations.

By signing this consent form, I hereby give my free and informed consent to be a participant in this study.

Printed Name and Signature of Participant Date

Printed Name and Signature of Witness

Date

For consent provided by a substitute decision maker

As substitute decision maker, I give my free and informed consent for the participation of _____ (name) in the research,

Printed name and Signature of Substitute Decision Maker Date

Relationship of Substitute Decision Maker to participant: _____

Printed Name and Signature of Witness Date

If the research participant was capable of giving assent,

I, _____ (name of health services representative) have read the accompanying Research Information Form to the prospective participant, after which I asked him or her to assent or dissent to research participation, and he or she assented to participation through the substitute decision maker named above.

If at any time I have further questions, problems, or adverse events, I will contact:

Principal Investigator:

Christian Keresztes, PhD, Cpsych
Research Associate
Queen's Health Policy Research Unit at 613-533-6387,
Monday to Friday, from 8:30 am to 4:30 pm

OR Orpah Mackenzie, HBScN, RN
Health Director, Keewaytinook Okimakanak First Nations Council
807-735-1381.

OR Dr. Albert Clark
Chair, Research Ethics Board, Queen's University
Office of Research Services, 613-533-6081.

APPENDIX H

Information Regarding the Study Entitled:

Evaluation of the Keewaytinook Okimakanak Telepsychiatry Pilot Project

Principal Investigator: Christian Keresztes, PhD, CPsych
Research Associate
Queen's Health Policy Research Unit
Queen's University
Kingston ON K7L 3N6
Tel.: 1 613 533 6000 ext. 74630

Description of the Project

Videoconferencing is a relatively new way to deliver medical services.

Dr. Christian Keresztes and his colleagues are conducting a study for Keewaytinook Okimakanak First Nations Council to assess the quality and the results of services offered by the Telepsychiatry Pilot Project. From the results of the study, we hope to identify the benefits and risks, if any, of videoconferencing as a way of providing consultation, and to provide information that will assist Keewaytinook Okimakanak First Nations Council in improving its telepsychiatry service.

Health care providers and community members who are familiar with the Telepsychiatry Pilot Project are invited to participate in this research study. Participation is voluntary.

The aim of the interviews is to form an overall impression of the effects the telepsychiatry service has had on the organization of health care delivery, and on the community as a whole.

Participants in the evaluation will be asked about their views of the Telepsychiatry Pilot Project that they are willing to share in public. The confidentiality of off-the-record views will be respected.

There are no known harms associated with your participation in this research. However, there may be harms we don't yet know about. You will not benefit directly from participation in this research.

Thank you for considering participation in this study.

Christian Keresztes, PhD, CPsych

APPENDIX I (i)

Chronology and Cost of Mental Health Service Provision: Service to Remote Communities without Telepsychiatry

Process - Poplar Hill	Cost: Psychiatrist	Cost: Counselor	Time	Service Provider	Payer
Referral					
- Needs Assessment Criteria	\$75.00	\$75.00		Clinical Health Nurse / Chief & Council / Teacher / Police	
- Follow-up Information Transfer & Appointment Set-up	\$75.00	\$75.00		Mental Health Consultant / Mental Health Worker	Poplar Hill Chief & Council
				Mental Health Consultant / Mental Health Worker	Poplar Hill Chief & Council
Service - Out of Community w/Escort					
Van to Airport	\$10.00	\$10.00	10 minutes	Poplar Hill Chief & Council	Poplar Hill Chief & Council
Client - Flight: Poplar Hill to Red Lake (½ of Return Fare) [*1]	\$131.61	\$131.61	1 hour	Bearskin Airlines	Health Canada - FNIHB (NIHB)
Escort - Flight: Poplar Hill to Red Lake (½ of Return Fare)	\$131.61	\$131.61	1 hour	Bearskin Airlines	Health Canada - FNIHB (NIHB)
Client - Flight: Red Lake to Sioux Lookout (½ of Return Fare)	\$233.26	\$233.26	1.75 hour	Bearskin Airlines	Health Canada - FNIHB (NIHB)
Escort - Flight: Red Lake to Sioux Lookout (½ of Return Fare)	\$233.26	\$233.26	1.75 hour	Bearskin Airlines	Health Canada - FNIHB (NIHB)
Orientation	\$20.00	\$20.00	15 minutes	SLFNHA Client Services	SLFNHA Client Services
SLFNHA Van / Taxi to Nodin [*2]	\$11.00	\$11.00	10 minutes	SLFNHA Van or Taxi Co.	SLFNHA Client Services
Night at Hostel / Hotel (See below [*3])					
SLFNHA Van / Taxi to Nodin	\$5.00	\$20.00	5 minutes	SLFNHA Van or Taxi Co.	SLFNHA Client Services
Nodin Consultation					
w/ Psychiatrist	\$200.00		1 hour, during 1 day	Nodin Counseling Service Centre	SLFNHA Client Services
w/ Mental Health Worker / Counselor		\$600.00	1½ to 2 hours/day, over 4 days	Nodin Counseling Service Centre	SLFNHA Client Services
Fixed Costs (Physical Plant, etc.) and Administration Expenses [*4]	\$145.00	\$580.00		Nodin Counseling Service Centre	SLFNHA Client Services
SLFNHA Van / Taxi to Hostel / Hotel	\$5.00	\$20.00	5 minutes	SLFNHA Van or Taxi Co.	SLFNHA Client Services
Food and Accommodation at Hostel / Hotel					
- If w/ Psychiatrist					
Accommodation (Avg. \$78.00/ Night[*2]) : Client - 2 nights if w/ Psychiatrist	\$156.00			Zone Hospital Hostel / Hotel	Health Canada - FNIHB (NIHB)
Accommodation (Avg. \$78.00/ Night) : Escort - 2 nights if w/ Psychiatrist	\$156.00			Zone Hospital Hostel / Hotel	Health Canada - FNIHB (NIHB)
Food: Client (\$46.20 per diem) - 3 days if w/ Psychiatrist	\$138.60			Zone Hospital Cafeteria / Restaurant	Health Canada - FNIHB (NIHB)
Food: Escort (\$46.20 per diem) - 3 days if w/ Psychiatrist	\$138.60			Zone Hospital Cafeteria / Restaurant	Health Canada - FNIHB (NIHB)

[I (i) cont'd]

Food and Accommodation at Hostel / Hotel

- If w/ Counselor

Accommodation (Avg. \$78.00/ Night) : Client - 4 nights if w/ Counselor	\$312.00			Zone Hospital Hostel / Hotel	Health Canada - FNIHB (NIHB)
Accommodation (Avg. \$78.00/ Night) : Escort - 4 nights if w/ Counselor	\$312.00			Zone Hospital Hostel / Hotel	Health Canada - FNIHB (NIHB)
Food: Client (\$46.20 per diem) - 5 days if w/ Counselor	\$231.00			Zone Hospital Cafeteria / Restaurant	Health Canada - FNIHB (NIHB)
Food: Escort (\$46.20 per diem) - 5 days if w/ Counselor	\$231.00			Zone Hospital Cafeteria / Restaurant	Health Canada - FNIHB (NIHB)
Misc. (per trip)	\$100.00	\$100.00		Misc.	Health Canada - FNIHB (NIHB)

Return to Community

Taxi to Airport	\$11.00	\$11.00	10 minutes	SLFNHA Van or Taxi Co.	SLFNHA Client Services
Client - Flight: Sioux Lookout to Red Lake (½ Return Fare)	\$233.26	\$233.26	1.75 hour	Bearskin Airlines	Health Canada - FNIHB (NIHB)
Escort - Flight: Sioux Lookout to Red Lake (½ Return Fare)	\$233.26	\$233.26	1.75 hour	Bearskin Airlines	Health Canada - FNIHB (NIHB)
Client - Flight: Red Lake to Poplar Hill (½ Return Fare)	\$131.61	\$131.61	0.50 hour	Bearskin Airlines	Health Canada - FNIHB (NIHB)
Escort - Flight: Red Lake to Poplar Hill (½ Return Fare)	\$131.61	\$131.61	0.50 hour	Bearskin Airlines	Health Canada - FNIHB (NIHB)
Van to Home	\$10.00	\$10.00	10 minutes	Poplar Hill Chief & Council	Poplar Hill Chief & Council

Total Cost per Client-Session(s)	\$2,715.68	\$4,077.48	3 days / 5 days		
---	-------------------	-------------------	------------------------	--	--

Assumptions:

- 1 - Flights to and from community are planned to minimize time and cost.
- 2 - Value of SLFNHA Van ride is taken to be the value of the next best alternative.
- 3 - Value of stay at hostel is taken to be the value of the next best alternative.
- 4 - Fixed Costs and Administration Expenses estimated at 20% total Nodin budget / hour (5-day week, 8-hour day).

Not Valued:

A - Preparation and Alternate Arrangements

Care of children / aged parents		Family and/or Friends	Client
Time away from employment		Client (Foregone Income)	Employer (Lost Productivity)

B - Follow-up

In Community Post-Session Care	as necessary	Community Mental Healthcare Worker	Poplar Hill Chief & Council
Out of Community Care in Sioux Lookout	3 to 5 days	Psychiatrist / Psychologist / Social Worker / Mental Health Counselor	- All of the Above -

APPENDIX I (ii)

Chronology and Cost of Mental Health Service Provision Service to Remote Communities - Telepsychiatry Pilot Project

Process - Poplar Hill	Cost	Time	Service Provider	Payer
Referral				
			Clinical Health Nurse / Chief & Council / Teacher / Police	
1st Client - Pre-Diagnosis Needs Assessment	\$75.00	1 hr	Mental Health Consultant / Mental Health Worker	Poplar Hill Chief & Council
2nd Client - Pre-Diagnosis Needs Assessment	\$75.00	1 hr	Mental Health Consultant / Mental Health Worker	Poplar Hill Chief & Council
Follow-up Information Transfer & Appointment Set-up	\$75.00	1 hr	Mental Health Consultant / Mental Health Worker	Poplar Hill Chief & Council
Service: Two Clients - Out of Community w/Escort				
Two Clients & Escorts				
Van to Airport	\$10.00		Poplar Hill Chief & Council	Poplar Hill Chief & Council
1st Client - Flight: Poplar Hill to Red Lake (½ Return Fare) [*1]	\$131.61		Bearskin Airlines	Health Canada - FNIHB (NIHB)
1st Escort - Flight: Poplar Hill to Red Lake (½ Return Fare)	\$131.61		Bearskin Airlines	Health Canada - FNIHB (NIHB)
2nd Client - Flight: Poplar Hill to Red Lake (½ Return Fare)	\$131.61		Bearskin Airlines	Health Canada - FNIHB (NIHB)
2nd Escort - Flight: Poplar Hill to Red Lake (½ Return Fare)	\$131.61		Bearskin Airlines	Health Canada - FNIHB (NIHB)
Taxi to Keewaytinook Okimakanak Office	\$10.00		Taxi / Keewaytinook Okimakanak Van	Health Canada - FNIHB (NIHB)
Mental Health Consultant to Red Lake				
Transportation from Home to Sioux Lookout Airport	\$5.00		Personal transport left at airport	Keewaytinook Okimakanak
Parking fee for leaving vehicle	\$10.00		Sioux Lookout Airport Authority	Keewaytinook Okimakanak
Flight: Sioux Lookout to Red Lake (½ Return Fare)	\$233.26		Bearskin Airlines	Keewaytinook Okimakanak
Taxi from Red Lake Airport to K O Band Office	\$10.00		Local Taxi Service	Keewaytinook Okimakanak
Consultation				
Psychiatrist - Winnipeg	\$750.00	1.5 hr / session	Contract Psychiatrist	Keewaytinook Okimakanak
Mental Health Consultant - On site for consultation	\$525.00	1.5 hr / session	Mental Health Consultant	Keewaytinook Okimakanak
Psychiatrist / MH Consultant - Prep & Follow-up	No Add'l Chg	0.5 hr / session	Contract Psychiatrist / Mental Health Consultant	Keewaytinook Okimakanak
Videoconferencing Line Charges (monthly fee charged per session)	\$260.00		Bell Canada	Keewaytinook Okimakanak
Capital Expenses				
Rent (Value of space used as an hourly charge)	nil		Poplar Hill Chief & Council	Poplar Hill Chief & Council
Videoconferencing Capital Equipment Charge - Poplar Hill [*4]	\$157.10		Zydacon	Keewaytinook Okimakanak
Videoconferencing Capital Equipment Charge - Winnipeg [*5]	\$117.83		Zydacon	Keewaytinook Okimakanak
Food and Accommodation				
1st Client (\$46.20 per diem)	\$46.20		Restaurant / Catering Firm	Health Canada - FNIHB (NIHB)
1st Escort (\$46.20 per diem)	\$46.20		Restaurant / Catering Firm	Health Canada - FNIHB (NIHB)
2nd Client (\$46.20 per diem)	\$46.20		Restaurant / Catering Firm	Health Canada - FNIHB (NIHB)
2nd Escort (\$46.20 per diem)	\$46.20		Restaurant / Catering Firm	Health Canada - FNIHB (NIHB)
Mental Health Counselor (\$46.20 per diem)	\$46.20		Restaurant / Catering Firm	Health Canada - FNIHB (NIHB)

[I (ii) - cont'd]

Mental Health Consultant to Sioux Lookout

Taxi to Red Lake Airport	\$10.00	Taxi / Keewaytinook Okimakanak Van	Keewaytinook Okimakanak
Flight: Red Lake to Sioux Lookout (½ Return Fare)	\$233.26	Bearskin Airlines	Keewaytinook Okimakanak
Transportation from Sioux Lookout Airport to Home	\$5.00	Personal transport left at airport	Keewaytinook Okimakanak

Two Clients & Escorts

Taxi to Red Lake Airport	\$10.00	Local Taxi Service	Health Canada - FNIHB (NIHB)
1st Client - Flight: Red Lake to Poplar Hill (½ Return Fare)	\$131.61	Bearskin Airlines	Health Canada - FNIHB (NIHB)
1st Escort - Flight: Red Lake to Poplar Hill (½ Return Fare)	\$131.61	Bearskin Airlines	Health Canada - FNIHB (NIHB)
2nd Client - Flight: Red Lake to Poplar Hill (½ Return Fare)	\$131.61	Bearskin Airlines	Health Canada - FNIHB (NIHB)
2nd Escort - Flight: Red Lake to Poplar Hill (½ Return Fare)	\$131.61	Bearskin Airlines	Health Canada - FNIHB (NIHB)
Van to Community	\$10.00	Poplar Hill Community Vehicle	Poplar Hill Chief & Council

Total Cost of a Session Day \$3,865.33

Average Cost per Client-Session \$1,932.66 2 Sessions per day

Process - North Spirit Lake	Cost		Service Provider	Payer
Referrals				
1st Client - Pre-Diagnosis Needs Assessment	\$75.00	1 hr	Clinical Health Nurse / Chief & Council / Teacher / Police	
2nd Client - Pre-Diagnosis Needs Assessment	\$75.00	1 hr	Mental Health Consultant / Mental Health Worker	North Spirit Lake Chief & Council
Follow-up Information Transfer & Appointment Set-ups	\$75.00		Mental Health Consultant / Mental Health Worker	North Spirit Lake Chief & Council
Service: Two Clients - In Community w/o Escort				
Mental Health Consultant to North Spirit Lake				
Transportation to Sioux Lookout Airport	\$5.00		Personal transportation	Keewaytinook Okimakanak
Parking fee for leaving vehicle	\$10.00		Sioux Lookout Airport Authority	Keewaytinook Okimakanak
Flight: Sioux Lookout to Red Lake (½ Return Fare)	\$233.26		Bearskin Airlines	Keewaytinook Okimakanak
Flight - Red Lake to North Spirit Lake (½ Return Fare)	\$147.20		Wild Country Airlines	Keewaytinook Okimakanak
Van to Community	\$10.00		North Spirit Lake Community Van	North Spirit Lake Chief & Council
Consultation				
Psychiatrist - Winnipeg	\$750.00		Contract Psychiatrist	Keewaytinook Okimakanak
Mental Health Consultant - On site during consultation [*2]	\$525.00		Mental Health Consultant	Keewaytinook Okimakanak
Psychiatrist / MH Consultant - Prep & Follow-up	No Add'l Chg		Contract Psychiatrist / Mental Health Consultant	Keewaytinook Okimakanak
Videoconferencing Line Charges [*3]	\$260.00		Bell Canada	Keewaytinook Okimakanak

[I (ii) - cont'd]

Capital Expenses

Rent (Value of space used as an hourly charge)	nil	North Spirit Lake Chief & Council	North Spirit Lake Chief & Council
Videoconferencing Capital Equipment Charge - North Spirit Lake [*4]	\$471.30	Zydacon	Keewaytinook Okimakanak
Videoconferencing Capital Equipment Charge - Winnipeg [*5]	\$117.83	Zydacon	Keewaytinook Okimakanak

Mental Health Consultant from North Spirit Lake

Van to Airport	\$10.00	North Spirit Lake Community Van	North Spirit Lake Chief & Council
Flight - North Spirit Lake to Red Lake (½ Return Fare)	\$147.20	Wild Country Airlines	Keewaytinook Okimakanak
Flight: Red Lake to Sioux Lookout (½ Return Fare)	\$233.26	Bearskin Airlines	Keewaytinook Okimakanak
Transportation to Home	\$5.00	Personal transportation	Keewaytinook Okimakanak

Total Cost of a Half-Day Session \$3,150.05

Average Cost per Client-Session **\$1,575.02** 2 Sessions per day

Assumptions [*]:

- 1 - Flights to and from community are planned to minimize time and cost.
- 2 - MHC will have other duties to perform while in the community for the telepsychiatry consultation, therefore her hourly wage was applied for the consult.
- 3 - Videoconferencing Line Charges assume no other use of the lines and 2-sessions per month.
- 4 - Videoconferencing Capital Equipment Charge for each community is the allowable annual depreciation rate on capital equipment (20%), expressed at a per day rate, prorated, per share of the assumed 24 session-days during the project.
- 5 - Videoconferencing Capital Equipment Charge for Winnipeg is the allowable annual depreciation rate on capital equipment (20%), expressed at a per day rate, assuming 24 sessions during the project.

Not Valued:

A - Preparation and Alternate Arrangements

Care of children / aged parents	Family and/or Friends	Client
Time away from employment	Client (Foregone Income)	Employer (Lost Productivity)

B - Follow-up

In Community Post-Session Care	Community Mental Healthcare Worker	First Nation Community Chief & Council
Out of Community Care in Sioux Lookout	Psychiatrist / Psychologist / Social Worker / Mental Health Counselor	- All of the Above -

APPENDIX I (iii)

**Chronology and Cost of Mental Health Service Provision
Service to Remote Communities - On-Going Telepsychiatry Programme**

Process - Any K-O Community (e.g.: North Spirit Lake)	Cost	Attributed Cost	Cost	Attributed Cost	Service Provider	Payer (Optimally)
	/Session-Day	/Client-Session	/Session-Day	/Client-Session		
	- w/ MHC on Site		- w/o MHC on Site			
Referrals [*1]					Clinical Health Nurse / Chief & Council / Teacher / Police	
1st Client - Pre-Diagnosis Needs Assessment	\$75.00	\$75.00	\$30.00	\$30.00	Mental Health Consultant / Mental Health Worker	First Nation Community Chief & Council
2nd Client - Pre-Diagnosis Needs Assessment	\$75.00		\$30.00		Mental Health Consultant / Mental Health Worker	First Nation Community Chief & Council
Follow-up Information Transfer & Appointment Set-up	\$75.00	\$37.50	\$30.00	\$15.00	Mental Health Consultant / Mental Health Worker	First Nation Community Chief & Council
SERVICE: Two Clients - In Community w/o Escort						
Mental Health Consultant to Community for a 5-day Stay [*2]						
Transportation to Sioux Lookout Airport	\$10.00	\$1.00	n.a.	n.a.	Personal transportation	Mental Health Consultant
Flight: Sioux Lookout to Red Lake (½ Return Fare)	\$466.52	\$46.65	n.a.	n.a.	Bearskin Airlines	First Nation Community Chief & Council
Flight - Red Lake to Community (½ Return Fare)	\$294.40	\$29.44	n.a.	n.a.	Wild Country Airlines	First Nation Community Chief & Council
Van Transport to Community	\$10.00	\$1.00	n.a.	n.a.	Community Vehicle	First Nation Community Chief & Council
Consultation						
Psychiatrist - Winnipeg	\$750.00	\$375.00	\$750.00	\$375.00	Contract Psychiatrist	SLFNHA Client Services
Mental Health Consultant (i.e. w/ MHC on site during	\$225.00	\$112.50	n.a.	n.a.	Mental Health Consultant	First Nation Community Chief & Council
Mental Health Worker (i.e. w/o MHC on site during consultation)	n.a.	n.a.	\$90.00	\$45.00		
Psychiatrist & MHC / MHW - Prep & Follow-up	\$75.00	\$37.50	\$30.00	\$15.50	Contract Psychiatrist & Mental Health Consultant / Mental Health	First Nation Community Chief & Council
Videoconferencing Line Charges [*3]	\$47.27	\$23.64	\$47.27	\$23.64	Bell Canada	First Nation Community Chief & Council
Capital Expenses						
Rent (Value of space used as an hourly charge)	nil	nil	nil	nil	First Nation Community Chief & Council	First Nation Community Chief & Council
Videoconferencing Capital Equipment Charge - Community [*4]	\$353.48	\$176.74	\$353.48	\$176.74	Zydacon	First Nation Community Chief & Council
Videoconferencing Capital Equipment Charge - Winnipeg [*5]	\$58.91	\$29.46	\$58.91	\$29.46	Zydacon	SLFNHA Client Services
Mental Health Consultant from North Spirit Lake						
Van Transport to Airport	\$10.00	\$1.00	n.a.	n.a.	First Nation Community Chief & Council	First Nation Community Chief & Council
Flight - Community to Red Lake (½ Return Fare)	\$147.20	\$14.72	n.a.	n.a.	Wild Country Airlines	First Nation Community Chief & Council
Flight: Red Lake to Sioux Lookout (½ Return Fare)	\$233.26	\$23.33	n.a.	n.a.	Bearskin Airlines	First Nation Community Chief & Council
Transportation to Home	\$10.00	\$1.00	n.a.	n.a.	Personal transportation	First Nation Community Chief & Council
Total Cost of a Half-Session-Day	\$2,916.04		\$1,419.66			
Total Cost per Client-Session		\$985.47		\$709.83		

[I (iii) - cont'd]

Assumptions [*]:

- 1 - Psychiatrist is contracted for one 3-hour session block, and consults with two clients for 1½ hr each.
- 2 - Consultation occurs during the 5-day rotation visit of the Mental Health Worker. Therefore, consultation rate is at an hourly rate and travel is a half day share of total cost.
- 3 - Videoconferencing Line Charges assume the lines are used full time by other videoconferencing systems (eg.: Chief & Council) and are rated as ¼-day of a 22-day monthly charge.
- 4 - Videoconferencing Capital Equipment Charge is the allowable annual depreciation rate on capital equipment (20%), expressed at a per day rate, assuming 1 session-day per visit and 8 visits per year.
- 5 - Videoconferencing Capital Equipment Charge for Winnipeg is the allowable annual depreciation rate on capital equipment (20%), expressed at a per day rate, assuming 48 session-days per year.

Not Valued:

A - Preparation and Alternate Arrangements

Care of children / aged parents

Family and/or Friends

Client

Time away from employment

Client (Foregone Income)

Employer (Lost Productivity)

B - Follow-up

In Community Post-Session Care

Community Mental Healthcare Worker

Poplar Hill Chief & Council

Out of Community Care in Sioux Lookout

Psychiatrist / Psychologist / Social Worker / Mental Health

- All of the Above -

References

1. Patton, M.Q. Utilization-focused evaluation, 3rd ed. Newbury Park, CA: Sage, 1997.
2. KPMG Consulting. Review of the literature on evaluation in telehealth. Commonwealth Department of Health and Aged Care: Australian New Zealand Telehealth Committee, 1999. Accessed: 24 July 2001 http://www.telehealth.org.au/discussion_papers/litreview.html
3. Lewin Group, Inc. "Assessment of Approaches to Evaluating Telemedicine: Final Report". Washington DC: Department of Health and Human Services, 2000. Accessed: 24 July 2001 <http://aspe.hhs.gov/search/health/reports/AAET/aaet.htm>
4. Nishnawbe Aski Nation: "About NAN - General Description". Accessed: 18 March 2002 <http://www.nan.on.ca/about/description.html>
5. Young, T. K. Health Care Cultural Change: the Indian Experience in the Central Subarctic (Toronto:University of Toronto Press, 1988)
6. Bain, H. W., Goldthorpe G. "The University of Toronto 'Sioux Lookout Project' - A model of health care delivery", *Canadian Medical Association Journal* 1972; 107: 523-9.
7. Levine, S. V., Eastwood, M.R., Rae-Grant, Q. "Psychiatric Services to Northern Indians: a university project", *Canadian Psychiatric Association Journal*, 19 (1974): 343-9.
8. Department of Psychiatry, University of Toronto, "Providing psychiatric care and consultation in remote Indian villages", *Hospital and Community Psychiatry* 1978; 29(10): 678-80.
9. Dunn, E. et al. "Telemedicine links patients in Sioux Lookout with doctors in Toronto", *Canadian Medical Association Journal*, 122(4)(1980): 484-487.
10. Timpson, J. "Indian Mental Health: Changes in the delivery of care in Northwestern Ontario", *Canadian Journal of Psychiatry*, 1984; 29 (10): 234-240.
11. Manson, S. M., Walker, R. D., Kivlahan, D. R. "Psychiatric assessment and treatment of American Indians and Alaska Natives", *Hospital and Community Psychiatry*, 1987, 38(2): 165-73.
12. Statistics Canada, Aboriginal Peoples of Canada. Accessed 13 February 2003: <http://www12.statcan.ca/english/census01/products/analytic/companion/abor/canada.cfm#1>
13. Abbott, P. J. Traditional and western healing practices for alcoholism in American Indians and Alaska Natives", *Substance Use & Misuse*, 1998; 33(13):2605-2646.
14. Sioux Lookout First Nations Health Authority Annual Report of Nodin Counseling Services, 2000-2001.
15. American Psychiatric Association - Committee on Telemedical Services, "APA resource document on telepsychiatry via videoconferencing", 1998; Accessed: 24 July 2001: http://www.psych.org/pract_of_psych/tp_paper.cfm#intro
16. Grigsby, B., "4th annual telemedicine program review. Part 2: United States", *Telemed Today*, 1997; 5(4):30-38, 42
17. Janca, A., "Telepsychiatry: An update on technology and its applications", *Current Opinion in Psychiatry*, 2000; 13(6):591-597.
18. Zaylor, C., P. Whitten, and C. Kingsley, "Telemedicine services to a county jail", *J Telemed Telecare*, 2000; 6 Suppl 1(2):S93-95.

19. Kennedy, C., "Outcomes of psychiatry services using videoconferencing", J Telemed Telecare, 1999; 5 Suppl. 1(139).
20. Mielonen, M.L., et al., "The use of videoconferencing for telepsychiatry in Finland", J Telemed Telecare, 1998; 4(3):125-131.
21. Rothchild, E., "Telepsychiatry: Why do it?", Psychiatric Annals, 1999; 29(7):394-401.
22. Capner, M., "Videoconferencing in the provision of psychological services at a distance", J Telemed Telecare, 2000; 6(6):311-319.
23. Jennett, P., et al., "Telelearning in a partnership between a university faculty and a regional health authority: benefits, challenges and strategies", J Telemed Telecare, 2000; 6(Suppl 2):S32-35.
24. Mitchell, J., et al., "An evaluation of a network for professional development in child and adolescent mental health in rural and remote communities", J Telemed Telecare, 2000; 6(158-162).
25. John Mitchell & Associates, "Optimising benefits by using integrated telemedicine for clinical, educational and administrative purposes", 1997. Accessed: 10 July 2002. <http://www.jma.com.au/itupresentation.htm>
26. Has, I.H., "A qualitative study of the organizational consequences of telemedicine", J Telemed Telecare, 2001; 7(1):18-26.
27. Dunn, E., et al., "Telemedicine links patients in Sioux Lookout with doctors in Toronto", Canadian Medical Association Journal, 1980; 122(4):484-487.
28. Dongier, M., et al., "Telepsychiatry: psychiatric consultation through two-way television. A controlled study", Can J Psychiatry, 1986; 31(1):32-34.
29. Update Software, "Telemedicine versus face to face patient care: effects on professional practice and health care outcomes (Cochrane Review).", 2001. Accessed: 11 April 2002. <http://www.update-software.com/abstracts/ab002098.htm>
30. Manchanda, M. and P. McLaren, "Cognitive behaviour therapy via interactive video", J Telemed Telecare, 1998; 4(Suppl 1):53-55.
31. Zaylor, C., "Clinical outcomes in telepsychiatry", J Telemed Telecare, 1999; 5 Suppl 1(6):S59-60.
32. Bouchard, S., et al., "Cognitive behavior therapy for panic disorder with agoraphobia in videoconference: Preliminary results", Cyberpsychology & Behavior, 2000; 3(6):999-1007.
33. D'Souza, R., "Telemedicine for intensive support of psychiatric inpatients admitted to local hospitals", J Telemed Telecare, 2000; 6(suppl. 1):26-28.
34. Kennedy, C. and P. Yellowlees, "A community-based approach to evaluation of health outcomes and costs for telepsychiatry in a rural population: preliminary results", J Telemed Telecare, 2000; 6 Suppl 1(2):S1:155-157.
35. Street, R.L., E.J. Wheeler, and W.T. McCaughan, "Specialist-primary care provider-patient communication in telemedicine consultations", Telemed J, 2000; 6(45-54).
36. Miller, E.A., "Telemedicine and doctor-patient communication: an analytical survey of the literature", Journal of Telemedicine and Telecare, 2001; 7(1-17).
37. Elford, D.R., et al., "A prospective satisfaction study and cost analysis of a pilot child telepsychiatry service in Newfoundland", J Telemed Telecare, 2001; 7(2):73-81.

38. Simpson, J., et al., "Evaluation of a routine telepsychiatry service", J Telemed Telecare, 2001; 7(2):90-98.
39. Elford, R., et al., "A randomized, controlled trial of child psychiatric assessments conducted using videoconferencing", J Telemed Telecare, 2000; 6(2):73-82.
40. Simpson, J., et al., "Telepsychiatry as a routine service - the perspective of the patient", J Telemed Telecare, 2001; 7(3):155-160.
41. Baer, L., D.R. Elford, and P. Cukor, "Telepsychiatry at forty: what have we learned?", Harv Rev Psychiatry, 1997; 5(1):7-17.
42. May, C., et al., "Telepsychiatry evaluation in the north-west of England: preliminary results of a qualitative study", J Telemed Telecare, 2000; 6 Suppl 1(2):S20-22.
43. Swanson, B., "Information technology and under-served communities", J Telemed Telecare, 1999; 5 Suppl 2(3):S3-10.
44. Anonymous, "Report of the Advisory Panel on the Provision of Medical Services in Underserved Regions", Canadian Medical Association, 1992.
45. Watanabe, M., P.A. Jennett, and M. Watson, "The effects of information technology on the physician workforce and health care in isolated communities: the Canadian picture", J Telemed Telecare, 1999; 5 Suppl. 2(11-19).
46. Elford, R., "Telemedicine activities at Memorial University of Newfoundland: a historical review, 1975-1997", Telemed J, 1998; 4(3):207-224.
47. Oosterheld, J., "Telemedicine and the delivery of child psychiatry services", University of South Dakota School of Medicine, 1997.
48. Cerda, G.M., et al., "Use of telemedicine with ethnic groups", Psychiatr Serv, 1999; 50(10):1364.
49. McLaren, P., et al., "An evaluation of the use of interactive television in an acute psychiatric service", J Telemed Telecare, 1995; 1(2):79-85.
50. Bracken, P. and P. Thomas, "Postpsychiatry: a new direction for mental health", British Medical Journal, 2001; 322(724-727).
51. Manson, S.M., "Culture and Major Depression - Current Challenges in the Diagnosis of Mood Disorders", Psychiatric Clinics of North America, 1995; 18(3):487-501.
52. Ross, R., (1992) Dancing with a Ghost: Exploring Indian Reality. Octopus Publishing Group: Markham, Canada.
53. O'Neil, T.D., "Psychiatric investigations among American Indians and Alaska natives: a critical review", Cult Med Psychiatry, 1989; 13(1):51-87.
54. Smith, M.A., "Psychiatric function and roles in an Indian health program context", Am Indian Alsk Native Ment Health Res, 1990; 4(1):41-52.
55. Manson, S.M., R.D. Walker, and D.R. Kivlahan, "Psychiatric assessment and treatment of American Indians and Alaska Natives", Hosp Community Psychiatry, 1987; 38(2):165-173.
56. Barrio, C., "The cultural relevance of community support programs", Psychiatric Services, 2000; 51(7):879-884.
57. Waldram, J.B. and S. Wong, "Group therapy of Aboriginal offenders in a Canadian forensic psychiatric facility", American Indian and Alaska Native Mental Health Research, 1995; 6(2):34-56.

58. Abbott, P.J., "Traditional and western healing practices for alcoholism in American Indians and Alaska Natives", Substance Use & Misuse, 1998; 33(13):2605-2646.
59. Thompson, S.J., S.M. Gifford, and L. Thorpe, "The social and cultural context of risk and prevention: food and physical activity in an urban Aboriginal community", Health Educ Behav, 2000; 27(6):725-743.
60. Wittson, C.L., D.C. Affleck, and V. Johnson, "Two-way television in group therapy", Mental Hospitals, 1961; 2(22-23).
61. Dwyer, T.F., "Telepsychiatry: psychiatric consultation by interactive television", Am J Psychiatry, 1973; 130(8):865-869.
62. Deitsch, S.E., B.C. Frueh, and A.B. Santos, "Telepsychiatry for post-traumatic stress disorder", J Telemed Telecare, 2000; 6(3):184-186.
63. Young, J., "Downlinks in the outback: A videoconference between Yuendumu, Australia, and San Francisco, California", Forbes, 1995; 156(13):68-70.
64. Miller, E., "Videoconferencing and memory of previous media", in Folklore Studies. 1998, University of Pennsylvania: Philadelphia. p. 16.
65. Kirmayer, L.J., G.M. Brass, and C.L. Tait, "The mental health of Aboriginal peoples: transformations of identity and community", Can J Psychiatry, 2000; 45(7):607-616.
66. Brooks, D., "Tulalips training selves to get wired", Seattle Times, 2000;
67. The Geological Society of London, "Cultural considerations in science: in for the long haul", 2001. Accessed 15 November 2001: <http://www.geolsoc.org.uk/template.cfm?name=LongHaul>
68. Hodges, M., "Online In the Outback:The Use of Videoconferencing by Australian Aborigines", Technology Review, 1996; 99(3):17-19.
69. Gransberg, G., J. Steinbring, and J. Hamer, "New Magic for Old: TV in Cree Culture", Journal of Communication, 1977; 154.
70. Riley, L.A., B. Nassersharif, and J. Mullen, "Assessment of Technology Infrastructure in Native Communities", College of Engineering, New Mexico State University, 1999.
71. Kreshak, J., "Technical and cultural challenges of remote health care on Everest", Yale J Biol Med, 1999; 72(1):29-31.
72. White, A.P. and P. Angood, "Advancing technologies in clinical medicine: The Yale-Mount Everest telemedicine project", Yale J Biol Med, 1999; 72
73. Macaulay, A.C., et al., "Participatory research with native community of Kahnawake creates innovative Code of Research Ethics", Can J Public Health, 1998; 89(2):105-108.
74. K-Net Services., From potential to practice: Telecommunications & development in the Nishnawbe-Aski Nation. Sioux Lookout ON: 31 March 2001.
75. Keewaytinook Okimakanak Telehealth: "Draft strategic health infostructure planning framework". Accessed: 15 November 2001. <http://health.knet.ca/telehealth/vision.html>
76. Timpson, J., Keewaytinook Okimakanak Council: A pilot project in telepsychiatry for Poplar Hill First Nation, January 2000.
77. Keewaytinook Okimakanak: "Telepsychiatry pilot project - update / report", October 11, 2000. Accessed: 15 November 2001. <http://health.knet.ca/telepsychiatry.html>

78. Patton, M. Q. *Qualitative evaluation and research methods*". Newbury Park, CA: Sage, 1990
79. Worthen, B. and J. Sanders. *Educational evaluation: Alternative approaches and practical guidelines*. New York: Longman, 1987.
80. Fugitt, D., and S. Wilcox. *Cost Benefit Analysis For Public Sector Decision Maker*, Quorum Books: Westport CT, 1999
81. Gabor, P. & Grinnell, R. *Evaluation and quality improvement in the human services*. Needham Heights, MA: Allyn & Bacon, 1994.
82. Field, M.J. *Telemedicine: A guide to assessing telecommunications in health care*. Washington, DC: national Academy Press, 1996.d
83. Strauss, A., & Corbin, J. *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage, 1990.
84. Patton, M.Q. *"Quantitative evaluation methods"*. Beverly Hills CA: Sage, 1980

Notes :