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ALBERTA MENTAL HEALTH BOARD

Application of an assessment framework to an evolving telemental health program

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This paper has been prepared on the basis of information from the Alberta Mental Health Board relating to its Telemental Health Service and also draws on earlier reports prepared by the Health Technology Assessment program of the Alberta Heritage Foundation for Medical Research.

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SUMMARY

- Evaluation requirements for the Telemental Health Service (TMH) operated by the Alberta Mental Health Board changed as this program evolved from a pilot project to a mature telehealth network.
- A guideline for assessment of telehealth applications, developed by the Alberta Heritage Foundation for Medical Research, has been used by the AMHB in its evaluation of the TMH.
- From a health technology assessment perspective, most attributes referred to in the guideline have been well covered in evaluations of telemental health undertaken by the AMHB. However, there were limitations in regard to assessment of outcomes and cost effectiveness.
- From the perspective of the AMHB, the assessment guideline has been helpful, though more so in the earlier stages of the TMH than for appraisal of a mature network.
- It has not proved possible for the AMHB to obtain all the measures of performance suggested by the guideline, which does not fully reflect local operational conditions.
- A variety of assessment activities related to the TMH continue to be undertaken by the AMHB. These have been helpful in local decision making.
- Constraints on assessment of the mature Telemental Health Service are the complexity of the current network, limited resources for evaluation and routine administrative requirements of decision – makers.

INTRODUCTION

Telehealth has had a long history and interest in its application continues to grow. However, there is still relatively little good quality information on the costs and benefits of telehealth applications, particularly in the context of routine services ¹. Much of the literature describes feasibility or pilot studies, rather than the practical use of this information and communications technology in routine health care.

The lack of information on costs and benefits of telehealth poses problems for those intending to acquire and use the technology, who will need such data to assist their decisions. Much of the information sought will need to come from assessment of the telehealth application.

In 1997 the AHFMR developed and published a guideline for assessment of telehealth applications ². That document was prepared because of the growing

interest and commitment to use of telehealth in Alberta at that time and the need of Regional Health Authorities (RHAs) and others for advice on how to deal with these developments. The guideline considered assessment of telehealth applications in terms of the attributes Specification, Performance measures, Outcomes, Summary measures, Operational considerations and Other issues. A health technology assessment (HTA) perspective was taken, with some consideration of Safety, Efficacy, Effectiveness and Economic impact as they might apply to telehealth.

The AHFMR guideline considered different phases in the life of a telehealth application, drawing attention to the need to consider planning, feasibility and pilot studies, initial routine clinical use and later developments as the telehealth program matured. However, there was particular emphasis on the early stages of this process, including development of a business case, reflecting the needs of RHAs and others at that stage of the diffusion of telehealth technology in the province.

At about the same time that the AHFMR guideline was being prepared, the Alberta Mental Health Board (AMHB)⁽¹⁾, in collaboration with five hospitals in four RHAs, had put in place a telepsychiatry pilot project as an intended first step in the development of Telemental Health Services throughout Alberta. Results of an assessment of the pilot project, which drew in part on advice from the AHFMR guideline, were presented in a report and in subsequent articles³⁻⁵.

The pilot project led to the establishment of a routine telepsychiatry service in central Alberta and subsequently to a Telemental Health (TMH) program throughout the province. These initiatives have been associated throughout with ongoing assessment undertaken by the AMHB. Experience with the initial period of routine operation was considered in a joint AMHB/AHFMR assessment⁶⁻⁸ and a further AMHB study has compared telepsychiatry services with face to face consultations⁹.

The AMHB experience with telepsychiatry provides an unusual opportunity to review the long - term development of a telemental health program from the pilot stage through to a province - wide network providing routine services. An aspect of some interest is the extent to which assessments of telepsychiatry and other services by the AMHB have followed the provisions of the AHFMR assessment guideline. Three aspects of this issue, which are considered in this paper:

⁽¹⁾ In this paper Alberta Mental Health Board has been used throughout to denote both the present Board and its predecessors, which had different titles.

- From the perspective of those formulating the assessment guideline, there is interest in whether the HTA – based provisions have been followed so as to provide appropriate information on which to base decisions on Telemental Health Services. What was the quality of the studies that were undertaken and what are the concerns with any limitations in the data obtained?
- From the perspective of the AMHB as the organization responsible for development and assessment of the telehealth service, there is consideration of the extent to which the guideline was seen as realistic. Were the points included in the guideline seen as valid and relevant to the telehealth service? Was collection of suggested data items feasible and potentially useful? To what extent has the guideline been helpful during the evolution of the Telemental Health Service?
- There is interest in how these local assessment initiatives have informed the policy and planning process at AMHB and in the Regions. What have been the effects of assessment of telepsychiatry services on decision making?

ELEMENTS COVERED IN THE ASSESSMENT GUIDELINE

The elements for telehealth assessment covered in the AHFMR guideline are outlined in Table 1. The Specifications section is supplemented in the guideline by a separate table that outlines the requirements for a business case. Attributes typically considered in many health technology assessments are covered under Outcomes and Summary Measures. Implicit in measurement of these attributes is comparison with a non-telehealth alternative.

The guideline considered efficacy of a telehealth application to be the performance of the technology, after an initial ‘learning curve’ period, under carefully applied and monitored protocols, such as those used in pilot projects. Effectiveness relates to how well the technology will perform after it has been adopted for routine use. It was noted that determination of effectiveness would require longer term follow up and appraisal.

The other elements in the table relate to important local issues that are likely to have a major effect on the degree of success of a telehealth application.

The guideline included a more detailed table relating specifically to telepsychiatry services. That table has provided the basis of the summary of AMHB experience given here.

Table 1: Elements for assessment of telehealth applications

Element	Attribute	Examples of items for the telehealth application and non - telehealth alternative
Specification	Key operating characteristics <ul style="list-style-type: none"> • Technology description • Assurance of continuity 	<ul style="list-style-type: none"> • Health service description • Equipment, carrier, support • Personnel, time • Performance of equipment, training, maintenance
Performance measures	Time	<ul style="list-style-type: none"> • Set up and booking time, travel • Consultation, intervention
	Quality	<ul style="list-style-type: none"> • Image, sound and service quality
	Cost	<ul style="list-style-type: none"> • Equipment, training, maintenance • Transmission, travel, staff
Outcomes	Safety	E.g. potential adverse effects on patient management decisions and through delayed or missing information
	Efficacy	E.g. Short term measures of timeliness, diagnostic accuracy
	Effectiveness	E.g. Measures of length of hospital stay, numbers of prescriptions, repeat consultations, satisfaction with service
Summary measures	Cost effectiveness	
	Cost comparison	
Operational considerations	Acceptability to: <ul style="list-style-type: none"> • Patients • Health care professionals • Managers 	Ease of use, convenience, cost to budget, time savings
	Access	Availability to population, potential increase in clients, potential decrease in other services
Other issues	E.g. Scheduling of services, confidentiality, educational benefits	

Source: reference ²

EVALUATION REQUIREMENTS FOR THE TELEMENTAL HEALTH SERVICE

Growth of the Telemental Health Service has taken place in stages, as indicated in Tables 2 and 3. Somewhat different program and evaluation requirements faced the AMHB at each stage, as summarized in Table 4.

Table 2: Numbers of AMHB telehealth sites

Fiscal year	Number of AMHB telehealth sites	Number of sites added by year
1996/ 97	6	6
1997/98	6	0
1998/99	12	6
1999/00	17	5
2000/01	22	5

Table 3: Numbers of sessions in the telemental health service

	Completed clinical consults	Educations sessions	Administrative meetings	Other
1996/ 97	111	1	6	9
1997/98	263	7	8	10
1998/99	320	4	36	42
1999/00	484	45	125	78
2000/01	702	88	166	37

Table 4: Evolving evaluation requirements from the telemental health service

Stage	Evaluation requirements
Pilot project <i>“is this feasible?”</i> <i>“should we exist?”</i>	Program efficacy Process details Initial cost analysis – comparison with a traveling psychiatrist Opinions /satisfaction for patients and health professionals
Initial routine use <i>“can it be sustainable”</i> <i>“can we continue to exist”</i>	Program effectiveness , initial indications of patient outcome Level of use and access More detailed cost analysis Influence of local practice
Expansion <i>“how should it develop further?”</i> <i>“should we exist and expand?”</i>	Demonstration of need by the participating communities Appraisal of multi-application use Access for under serviced communities
Mature network, planning for the future <i>“is the service effective, efficient and equitable?”</i> <i>“what new services should exist?”</i>	Sustainability – cost of equipment and network, non-cost issues such as referral patterns Volume of service by receiving sites New technology – effectiveness, cost New services – benefit, cost, reach, suitability, satisfaction Ability to support AMHB programs and services more broadly Outcome measures

Evaluation of the quality of the service applied to all phases

AMHB ASSESSMENT ACTIVITIES AND THE GUIDELINE FRAMEWORK

The AMHB assessment experience during development of the Telemental Health Service, including the various stages outlined in Table 4, is summarized in Appendix A. The tables in the Appendix are based on based on the “telepsychiatry assessment “ table from the AHFMR guideline ².

Comments on the AMHB assessments are now presented from the perspectives of the guideline, the AMHB program and decision-makers.

GUIDELINE PERSPECTIVE ON THE AMHB ASSESSMENTS - WHAT HAS BEEN MEASURED?

From the perspective of the guideline, the items listed under **Specification** and **Other issues** have been dealt with thoroughly in the AMHB assessments ^{3,6} and subsequent program management. An important point covered in the guideline,

though not listed in Table 1, was the need for a person to coordinate the service. This was also well covered in the assessments. Acceptability to managers has not been evaluated formally, though there has been frequent contact with managers who are given the opportunity to provide suggestions about the Telemental Health Service.

Under **Operational considerations**, acceptability to health professionals and patients has been covered throughout using survey approaches and continues periodically. Numbers and distribution of patients have been obtained throughout to give a useful picture of the extent of use of the service. A limitation is that there appear to be no comparative data on patients receiving face to face consultations, so that the overall place of the TMH service in the province is still not entirely clear.

Under **Performance measures**, most of the time elements have been measured or considered throughout. The data relating to patients and families were obtained on the basis of fairly basic estimates and are currently collected to meet comparatively limited Alberta Wellnet requirements.

Quality issues have been addressed throughout, including satisfaction with consultations, with at least some comparison with face to face consultations (opinions from surveys).

Most cost data elements were available throughout and are currently incorporated in routine financial records. Only limited cost information is available on patient and family items. Information is made available to Alberta Wellnet regarding patient travel costs saved, but this is self - reported information and is collected by the referring site rather than by AMHB.

With **Outcomes** there are some limitations, from a guideline and Health Technology Assessment perspective.

Safety aspects were not addressed in any detail throughout the assessments. However, while there was no formal measurement, experience and data from the program informs several of these points. Responses from surveys of patients and health professionals undertaken during the pilot and routine use assessments suggested that the service was well accepted and that misunderstood advice did not appear to be a significant problem. Consequences of missed appointments in the absence of telehealth was a matter that received some consideration, albeit in qualitative terms. Removal of travel – associated risks for both patients and psychiatrists was also recognized.

In general, there would be high confidence that safety issues were not of major significance for this telehealth application.

With efficacy, short term measures of satisfaction with the service, quality, and timeliness were obtained during the pilot project and appeared reasonable for

the initial stages of the program. Similar sorts of information were obtained during routine use and usefully confirmed the experience of the pilot project. However, emerging limitations at that stage were the absence of any health status measures, other than survey opinions from physicians, and also the absence of comparative data from face to face consultations.

Effectiveness has been dealt with through a small benchmark study⁹ and a randomized controlled trial is planned, with some patients now enrolled. Routine measurement of patients' mental health status has now been started. Some suggested surrogate measures, such as drug consumption and length of hospital stay, have not been feasible though some consideration was given to hospitalization of clients during assessment of the routine service. In general, there still seems limited information on the comparative performance of telepsychiatry and face to face consultation, so that in a strict sense level of effectiveness is not yet established.

With **Summary measures**, the first two assessments included break even analyses, comparing the costs of telehealth with those of face to face consultation. Cost effectiveness has not yet been addressed and will await availability of appropriate comparative data.

AMHB PROGRAM PERSPECTIVE ON THE GUIDELINE: WHAT IS RELEVANT AND ACHIEVABLE?

From the AMHB perspective the relevance and usefulness of the guideline are influenced by the realities of operating a practical telehealth program within the Alberta health care system. Aspects that have presented particular difficulty are the availability of data, especially outcomes data, and the increasing complexity of the Telemental Health Service. Another practical consideration is the level of resources available to undertake assessment activities.

Safety

Measurements of the variables identified in the AHFMR framework were not performed by AMHB. It may not be possible to gather the necessary information to report on these suggested measures. For example, if a client misunderstands received advice it may not be possible to attribute this to a telehealth-related factor. An aspect that has been considered by AMHB, which was not addressed in the assessment guideline, was inclusion of a measure of adverse outcomes/critical incident review.

Effectiveness, longer term measures

Some long-term measures identified in the framework do not have a directly comparable evaluation activity performed by the Telemental Health Service.

These measures include participant's time, length of hospital stay, and numbers of prescriptions. Some of these measures would be difficult to incorporate as routine evaluation activities.

There is general information on the length of a clinical session and time billed by the consulting clinician but there is uncertainty regarding the time taken by clients or other participants in the telehealth process.

Two of the measures suggested in the framework, length of hospital stay and number of prescriptions, may not lend themselves to the Alberta model of a Telemental Health Service as the necessary information may not be directly available to the service providing telepsychiatry consults. Hospital stay data are not readily available to the Telemental Health Service.

Specific treatment information such as numbers of prescriptions is available to the client's attending physician and may not be available to the Telemental Health Service. Efforts to record prescriptions and use of drugs were made during the earlier telepsychiatry assessments but consistent data could not be obtained. However, current practice is to record for each consult whether any change to the current prescription was made or whether there was a new prescription.

Cost and cost effectiveness

Cost analysis studies can be difficult to perform on a service that is expanding and changing. Cost comparisons of telepsychiatry with the alternative were performed as part of the pilot project and the assessment of routine telepsychiatry services. These analyses were helpful in demonstrating the feasibility of the service.

Any extension of cost studies to cost effectiveness measures has been hampered by the absence of reasonable quality data on effectiveness of Telemental Health Services. A further issue that has emerged as the AMHB telehealth program has grown is the increasing complexity of the network, which poses challenges for cost effectiveness studies. At this stage, a way forward would be to perform cost effectiveness analysis on portions of the service; for example, the Dual Diagnosis Recovery Service that was introduced in August 2000. A series of cost effectiveness studies would seem more practical than attempting to consider the Telemental Health Service as a whole.

WHAT IS THE USEFULNESS OF THE ASSESSMENT FRAMEWORK?

The AHFMR framework focused particularly on the planning and implementation of a new telehealth program. From the perspective of an operational telehealth service, the framework may not incorporate all necessary

evaluation criteria. However, the framework also specifically addresses long term issues, especially effectiveness and cost effectiveness.

The framework has been useful to the Telemental Health Service in giving guidance on approaches to demonstrate the operation and usefulness of a telehealth application. This has been valuable in terms of informing stakeholders in the Telemental Health Service, including those with senior administrative and political roles.

Evaluation-related activities undertaken by the Telemental Health Service differ in some areas from those suggested in the assessment framework. The main reason that the evaluation activities do not parallel those suggested in the framework is the changing evaluation requirements noted in Table 4. Different evaluation approaches, not captured in the framework, may be necessary as a service grows. As the service has expanded the information that is reported internally and externally has changed. Much of the information routinely collected in the expanded network is to meet reporting requirements and assist quality management, rather than being directed to specific assessment protocols.

Changes may be required to the assessment framework to extend its relevance to an operational, large scale, telehealth program. However, some of the issues facing the AMHB suggest that even a modified framework might have limitations as a worthwhile aid to management.

A reality facing the Telemental Health Service (and most other telehealth programs) is that resources for assessment and other activities do not grow as the volume of activity increases. Resources available to undertake some of the outcome studies visualized in the framework remain very limited. There is increasing interest in the TMH and the number of requests for information. Many data requests from physicians and administrators seek detailed breakdowns of services performed. These approaches for information put further demands on resources.

The increased complexity of the Telemental Health Service presents problems for those seeking to apply an instrument such as the AHFMR framework, which essentially applied to a single application and (by inference) to a limited number of sites. The TMH now includes a range of applications – clinical, educational, and administrative – and a large number of sites throughout the province and also outside Alberta. Approaches suggested in the framework are helpful in considering and assessing specific areas of the program, for example in developing a business case approach for new applications and for new partners. Approaches to evaluation of the service as a whole would need to be developed and would be complex and require significant assessment resources. A further area of complexity is that the AMHB interacts through the Telemental Health Service with many other bodies, including Alberta Wellnet and RHAs. Many

groups are involved with different sites and applications and there will often not be common standards.

Some current and potential evaluation and data collection activities of the Telemental Health Service are summarized in Table 5.

Table 5: Potential evaluation and data collection activities

<p>Data to support ongoing operation</p> <p>Growth projections together with budgetary information to determine if changes are required to the service to ensure sustainability. For example, what is the combined network cost for all sites and are there alternatives that would reduce these costs.</p> <p>Demonstration that Telemental Health is meeting the goals defined in the AMHB business plan, specifically the ability of TMH to improve the delivery of accessible, effective, quality mental health services in Alberta.</p> <p>Long term measures</p> <p>Cost comparison/cost effectiveness evaluation of specific subsections of the overall service.</p> <p>Determination of the impact of telepsychiatric services on the health care system</p> <p>Retaining/recruiting specialists</p> <p>How to recruit and retain specialists, and sub specialists.</p> <p>Other evaluation activities</p> <p>Urgent consults – outcome, or other, measures on this subsection of clients served by telepsychiatry.</p> <p>Information for other telehealth services</p> <p>How to pick a new site or new service</p> <p>Which variables have the largest impact on the success of a new site e.g., physician support, staff.</p>
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DECISION - MAKERS' PERSPECTIVE ON THE ASSESSMENTS: WHAT INFORMATION HAS HELPED, WHAT IS NEEDED?

Data from the initial assessment were used to obtain the commitment of AMHB to progress from pilot project to routine (established) services. Demonstrated success, from the assessment of initial routine services, led to approval for funding of additional sites.

The pilot project introduced the concept of health technology assessment to the AMHB. A province-wide inventory of research methodologies in use also included HTA. The assessments provided information to the AMHB on the value of evaluation and the need for timeliness in obtaining and considering assessment results. The early assessments also addressed

issues of affordability and sustainability before they became more generally canvassed in the province. The relevance of the AMHB approach has been confirmed and maintained.

While not directly relevant to this report, the AMHB assessments also provided a foundation for further evaluation and research now being undertaken across the province.

The following discussion summarizes other ways in which findings from local evaluation have been applied to decision making. Some of these activities relate directly to points made in the assessment guidelines, others have emerged from various program requirements.

Evaluation activities as required by Alberta Wellnet (ongoing)

Alberta Wellnet reporting provisions were introduced in 1999. Monthly and quarterly reports are submitted.

The monthly activity report quantifies the number of transactions (each event at each participating telehealth site is a transaction) and the number of attendees at each site. Each health authority is responsible for submitting a total number of transactions and participants for each telehealth site on a monthly basis. The quarterly report is more extensive, with three main areas of measure – access, quality, and cost/ cost benefit. The report structures are shown in Table 6.

Table 6: Alberta Wellnet telehealth report structures

Monthly reports

Conference Type	Professional Count	Patient Count	Family Count	Trans-action Count
Clinical	#	#	#	#
Learning	#	#	#	#
Administration	#	#	#	#
Other	#	#	#	#
Report Total:	#	#	#	#

Quarterly reports

Access:

- a. Average wait time (computed for new clients, follow up clients, and % change since previous quarter)
- b. Number of sessions (by clinical, learning, administrative)
- c. Number of attendees (also % change since previous quarter)
- d. Number of new programs, with a text description of the new programs.

Quality:

- a. Number of satisfaction surveys completed
- b. Number of participants (by clinical, admin, learning, other, for clinical attendees are broken out by professional, patient, family)
- c. Per cent satisfied
- d. Comments

Cost/ Cost Benefit

Travel avoided (km)

Travel cost avoided (\$)

Travel time avoided (days, hours, min)

Operational costs (Infrastructure, Human resources costs, Operational costs)

The submission of these reports is a requirement and many of these measures do not inform internal decision-making. AMHB is presently working with other RHAs and Alberta Wellnet to help improve the reporting process. Some measures submitted to Alberta Wellnet are used for AMHB evaluation and administrative needs, including preparation of reports for its Board.

For sites with lower numbers of consults, use of alternative services is investigated and requirements assessed to determine if the existing videoconferencing equipment can meet the demands.

Wait list information informs the need to recruit more consulting physicians.

Routine service evaluation results were incorporated into a business case used in application for equipment funding from Alberta Wellnet. Quarterly evaluation statistics are used in combination with information from RHAs to demonstrate viability and growth of telehealth.

Other data are used for formal and informal presentations and for proposals.

Evaluation activities as required by Alberta Mental Health Board (ongoing)

Information is used for the preparation of funding proposals, presentations to internal and external audiences, and drafting of reports as required.

Financial analysis (ongoing)

This includes:

- Cost of network - investigation of alternative means of providing videoconferencing.
- Cost of technology to investigate lower -cost equipment for service delivery.

- Sustainability of services - use of a formal business case to justify allocation of resources to new services.

General Practitioner opinions

A GP satisfaction survey was undertaken in 2000, considering impact of service on ability of physicians to treat clients in the community. Investigation of shared care model of service.

Tele-education assessment finding that tele-education sessions are not reaching this target audience (GPs).

Comparison of telepsychiatry with conventional consultation

A benchmark study (2000) was used to provide comparison of telepsychiatry with face to face alternative and give assurance that this is not a second best service. This has helped to establish the use of telehealth technology in the community mental health service.

Client opinions

Client telephone interviews in 1999 regarding the service preferences e.g., “would you rather use telepsychiatry than wait to see a psychiatrist in person?” Positive response indicated the suitability of the service to this client population. Surveys are continuing on sporadic basis, as appropriate.

Client follow up interviews in 2000 were undertaken 1 to 4 months post consult. Measures included self-reported health status and questions indicating that telepsychiatry provided the mental health service they required and an overall satisfaction with the service.

Telepsychology

Comparison of psychological test scores performed face-to-face and by videoconference to determine if videoconferencing is a reliable and valid medium for the assessment of cognitive functioning. Results to date for a geriatric population show no statistically significant difference between face-to-face and videoconferencing on most measures. A trend toward marginally stronger performance in session two, regardless of testing format (i.e., practice effect), was noticed.

Results have been used to demonstrate the viability of administering psychological tests using videoconferencing technology.

Children’s mental health service (2001)

Indicates that telepsychiatry is, for the most part, appropriate for this client population.

OPPORTUNITIES FOR CHANGE AND LIMITATIONS TO ROUTINE ASSESSMENT OF TELEHEALTH SERVICES

From the experience of the AMHB, the assessment framework has some useful features and was a helpful guide, particularly in the earlier stages of the Telemental Health Service. It has been less useful as the service has developed further. Some specific suggestions for change to the guideline are to include subsections on specific types of service and to identify the most important or relevant indications and outcome measures. A possible problem here is that of matching a generic assessment guide to the specific needs of a telehealth network, which might require a 'customized' approach, while retaining essential assessment principles.

An addition to the framework that is suggested by the AMHB is some measure of adverse outcomes/critical incident review as a component of assessing safety of the telehealth application. A challenge in applying such provision might be the difficulty in obtaining details and clarifying responsibilities in the off site situation.

The AMHB would wish the framework to reflect a realistic expectation of the evaluation activities that can be undertaken by an operational telehealth program. This in turn points to some challenges facing assessment of established telehealth networks that are likely to apply in many health care systems. Long term data collection and availability, resources, network complexity, and decision makers' needs are all issues that have emerged during the development of the Telemental Health Service.

Routine data collection may be well established, as is the case with the AMHB program, but is unlikely to include items that would be needed for specific assessment purposes. Health related quality of life measures would be an example. In such areas, data collection is more likely to be linked to conduct of a specific study, when resources can be found to put it in place. Other types of data, such as use of drugs, may lend themselves more obviously to routine collection, but for various local reasons may not be able to be captured reliably, as has been the case with the Telemental Health Service. Further possible limitations are the scope of administrative data and restricted access to them that may apply more generally within a health care system.

Resources for assessment at the local level are a real difficulty. Even with the AMHB, which has maintained a continuous assessment program throughout the life of the Telemental Health Service, there are limits to evaluations that can realistically be undertaken.

The complexity of a routine telehealth network such as the Telemental Health Service poses challenges for assessment, and further work on economic and other evaluation approaches seems desirable. Certainly, there seem to be definite limits to the usefulness of a generic assessment framework in this situation. Parts of a complex telehealth network can still be usefully assessed using the framework as a guide, but overall appraisal of such a system seems to require a somewhat different approach.

Finally, resources and topics for assessment will in practice need to be considered in the light of overall needs of decision-makers in the health care system. Some of these needs, such as data on access and level of use, may be closely tied to administrative or political decisions and may take priority over data on outcomes of telehealth services.

APPENDIX A: COMPARISON OF TMH EVALUATION ACTIVITIES WITH AHFMR TELEPSYCHIATRY EVALUATION FRAMEWORK

The basis for comparison in the following tables is the detailed list of suggestions for a telepsychiatry application given in the AHFMR guideline ². AMHB evaluation experience in different areas is summarized for the different phases of the Telemental Health Service program – pilot project, initial routine use, 1998 expansion and present service.

Abbreviations

AHP: Alberta Hospital Ponoka

TMH: Telemental Health Service

DSM IV: Diagnostic and Statistical Manual

GAF: Global Assessment of Functioning

RHA: Regional Health Authority

Table 7: Comparison of specification details

AHFMR Telepsychiatry Evaluation Framework	AMHB Evaluation Experience		
	Pilot / initial routine	1998 Expansion	Present Service
Base site, other sites	AHP + 5 sites in 4 RHAs	AHP + additional RHA sites	AHP, RHAs province wide; administrative and other clinical. Teleeducation, including out of province
Communication carrier	Switch 56	Satellite, Switch 56, ISDN	Satellite, ISDN, Switch 56, Primary Rate ISDN, Data Network (IP based)
Number of lines	Six lines @ 56Kb/s each	Six lines @ 56Kb/s each	Six lines @ 56Kb/s each or Six lines @ 64 Kb/s each (using a gateway for satellite)
Complementary technology	Fax	Fax	Fax, POTS videophone
Personnel involved, psychiatric subspecialties, other health care staff	Psychiatrists: General (adult) Support staff, GPs	Psychiatrists:	Psychiatrists: Children's, Psychogeriatrics, Dual Diagnosis, General (adult)... Psychologists
Expected transmission time	1 hour	1 hour	1 hour
Arrangements for maintenance	One year warranty provided by supplier	Warranty and yearly service purchased from vendor	Warranty and yearly service purchased from vendor

Table 7: Comparison of specification details (cont'd)

AHFMR Telepsychiatry Evaluation Framework	AMHB Evaluation Experience		
	Pilot / initial routine	1998 Expansion	Present Service
Scheduling	Manual scheduling of resources in a daytimer Excel spreadsheet for tracking	Manual scheduling of resources in a daytimer Excel spreadsheet for tracking	<p>Scheduling through a single point of entry by TMH support specialists located at AHP.</p> <p>An electronic scheduling system is used to record consult date, time, name of client, location of client.</p> <p>Scheduling processes include the use of a Microsoft Excel spreadsheet for tracking clients (referring physician, date of referral.....)</p> <p>Partnered with Calgary Health Region to develop a WWW based province wide telehealth scheduling system. Deployed in September, 2001 to 14 participating agencies (RHA, Boards) in Alberta.</p>

Table 8: Performance measures - time

AHFMR Framework	Pilot	Initial routine	Expansion	Present service
Time to book consultations, maintain records	40 minutes per call (20 mins @ each site)	Similar to pilot study	Not determined	This information has not been collected for evaluation purposes
Psychiatrist time (consultation & preparation)	1.5 hours for a new client - includes time for paperwork, some variation by service or consultant; 1.0 hours for follow up client			
Other health care professional time	Not determined			
Patient and families' travel	Not determined	Estimates for cost analysis, information from patients	Not collected for evaluation purposes	AMHB does not measure client and family travelling. For Alberta Wellnet quarterly reports, travel time avoided (client and family) calculation is performed by the remote, referring, site.
Missed appointments	Recorded during pilot project	Recorded	Recorded in the TMH client tracking spreadsheet	Record the reason for the cancellation: client no show, cancelled by consulting clinician, equipment failure.

Table 9: Performance measures - quality

AHFMR Framework	Pilot	Initial routine	Expansion	Present service
Quality and stability of the image	Data collected for evaluation purposes	Client and psychiatrist opinion, questionnaires	Physician logbook	Consulting clinician records technical issues on the TMH physician form
Clarity of audio transmission	As above – questionnaire eg	As above	Physician logbook	TMH physician form. No specific inquiry into the quality of the audio is made.
Quality of the consultation - clinical perspective;	Clinical: Questionnaire & interviews, psych, referring physicians	Clinical: recorded in the physician logbook	Clinical: recorded in the physician logbook	Clinical: clinician satisfaction recorded on the TMH physicians form. Also questionnaire sent periodically to referring physicians regarding quality of the service
- patient perspective	Client: questionnaire & telephone interviews	Questionnaire & telephone interviews	Client: satisfaction form	Client: periodically, using satisfaction form, specifically for new services Also telephone follow up interview of clients

Table 10: Performance measurement - cost

AHFMR Framework	Pilot	Initial routine	Expansion	Present service
Equipment set up costs	Determined for pilot project reports	Estimate from pilot project used	Financial records	Information available from financial records
Training costs	Not determined		Not determined	Financial analysis on new services performed during the drafting of the business case
Communications costs	Line charges	Line charges	Financial records	
Psychiatrists, consultations	Estimated travel – related costs for comparator, standard fee for consult	As for pilot project	Not determined, used value from pilot	Financial records Break even analysis performed (early 2000)
Other health care professionals	Not collected for evaluation purposes		Not determined	Not determined
Patient and family travel and lost work		Self report by some clients, estimates	Not determined	For Alberta We//net quarterly reports, travel time avoided (client and family) calculation is performed by the remote, or referring, site. Does not include loss of work time.

Table 11: Outcomes - safety

AHFMR Framework	Pilot	Initial routine	Expansion	Present service
Missed/incorrect diagnosis	Not determined			Have made follow up consultations with the same psychiatrist available.
Misunderstood advice because of telehealth – related factors	Not collected for evaluation purposes			
Consequences of missed appointments	Not collected for evaluation purposes			
Travel accident risks for patients	Not quantified, but issue considered throughout			

Note: To enhance ability to correctly diagnose have added other tools e.g., child behaviour checklist, parent/teacher checklist.

Table 12: Outcomes - efficacy

AHFMR Framework	Pilot	Initial routine	Expansion
Clinical performance in context of pilot project (e.g. with defined protocol.)	Satisfaction, other surveys	Satisfaction, other surveys	Periodic chart audit
Short term measures of: timeliness of consultation	Satisfaction surveys	Wait list calculated January to March 1997	Wait list calculation performed on a regular basis for Alberta We//net reporting requirements
Staff and patient time	Estimates as in Table 8.	Estimates as in Table 8.	Not determined, can not be certain of the total time commitment of staff at the remote site, or of the client
Quality of consultation	Satisfaction, other surveys	Satisfaction, other surveys	Measured Client satisfaction questionnaire and telephone follow up, clinician satisfaction, and referring physician follow up questionnaire
Health status	Not collected	Physicians' impressions, interviews	Euroqol, SF12, measures are or have been collected on a routine basis

Note: Established standards and guidelines for clinical consultation are in place.

Table 13: Outcomes - effectiveness

AHFMR Framework longer term measures of:	Initial routine	Expansion	Present service
Timeliness			Ongoing monitoring of wait list length
Participants' time			Not determined
Quality of consultation	Questionnaires, log book	Overall problems from the logbook	Periodic review of quality of consultant's letters. Initial monitoring of new psychiatrist
Length of hospital stay	Not determined		
Numbers of prescriptions	Attempted but data unreliable	Not determined	
Numbers of missed and repeat consultations	Recorded number of missed and repeat consults		Differentiate between no show and cancelled, also include why the session was cancelled.
Mental health status	Not recorded	Recorded four axis DSM IV for new clients.	DSM IV criteria and fifth axis GAF recorded during a client's first telepsychiatry consult. Not recorded for follow up consults

Table 14: Outcomes – summary measures - cost comparison and cost effectiveness

AHFMR Framework	Pilot	Initial routine	Expansion	Present service
Overall cost of service	Collected	Collected	Financial records	Data from break even analysis, revised (early 2000) incorporating the number of sites, cost to each site. Break down by system usage time as only 50% is by clinical, other usages... administrative, education.
Cost per consultation, cost per patient	Collected	Collected	Financial records	Cost per consultation is not recorded. For Alberta We//net reporting requirements remote, referring, site is to perform a calculation regarding travel cost avoidance.
Cost effectiveness				
(eg) Change in cost / change in number of clinically successful cases	Not determined			

Table 15: Operational considerations

AHFMR Framework	Pilot	Initial routine	Expansion	Present service
Acceptability to:				
Patients	Client satisfaction form			Periodically client satisfaction form specifically for new services
Health care professionals	Questionnaire, interview		Recorded in the session logbook	Periodically for GPs and consultants, including referring GP survey
Managers	Not collected, informal feedback			
Access				
Numbers and distribution of patients consulted		Determined by referring GP sites, from the tracking sheet by site and for client by site they consulted at.		
Wait time		Short term (Jan to March 1997)	Performed periodically	Wait time is calculated for new and follow up consults and reported to Alberta We/net.

Table 16: Other issues

AHFMR Framework	Pilot	Initial routine	Expansion	Present service
Operational difficulties with telehealth application.	Telehealth difficulties identified in reports		Difficulties recorded in session logbook	Alberta We//net technology reports. Physician form “appropriateness of the technology”
Use of qualitative approach (log book) with feedback to eliminate or minimize problems.	This approach used			Ongoing communication within the Telemental Health Service and with telehealth site coordinators to identify and remedy problems as they arise.
Training and quality assurance requirements for operations.	Training of site coordinators. Psychiatrist given orientation to the equipment (provided with min. working knowledge)		Initial for new employees, and periodic vendor training. Site coordinators manual Training for TMH site coordinators	Initial for new employees, and periodic vendor training. Site coordinators manual Training for TMH site coordinators
Identify ongoing operational difficulties with current services.			Team meetings Informal in-house meetings regarding operations and organizational structure	

Table 16: Other issues (cont'd)

AHFMR Framework	Pilot	Initial routine	Expansion	Present service
Consider privacy and confidentiality issues related to consultations and access to medical records.	Preliminary protocols		Revised client consent form and procedure for site coordinators introducing equipment, verbal explanation and assurance privacy	Privacy impact assessment – completed and accepted by the office of the information and privacy commissioner. Periodic review of internal processes Revised privacy form for teachers, parents for child psychiatry who are completing the Child Behaviour Checklist.
Review existing arrangements / standards.				Clinical practice and standards protocol being developed.

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