The Manitoba Air Ambulance Program: An Evaluation Assessment

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RÉSUMÉ

En plusieurs circonstances, il est requis d'évaluer des programmes, en utilisant des norme vagues ou encore non-extistantes. La valeur perçue d'un programme peut alors dépendre de l'opinion de ceux qui l'emploient. Ce traité demontre un procédé d'évaluation d'un programme gouvernemental de transport ambulancier aérien. C'est une façon de définer les normes d'évaluation, d'établir une visée appropriée ainsi que de présenter des alternatives.

ABSTRACT

In many circumstances, programs are required to be evaluated against vague or nonexisting standards. A program's perceived worth may then be dependent upon the viewpoint of the users. This case demonstrates an evaluation assessment process in a government operated health delivery program. It is one approach to defining the evaluation issues, establishing an appropriate focus, and constructing alternatives.

The official announcement in June 1984 that the Province of Manitoba would be implementing an Air Ambulance Program was seen as a progressive step towards the improvement of the delivery of health care to rural areas. The Manitoba Health Service Commission (MHSC) was told to have the program operational in eight months. The managers were also informed that they should evaluate the new service after six months of operation and report the findings to the Minister of Health.

This last request posed a problem for the managers. The new program was going to impact on a wide spectrum of health services from the remote nursing station to the tertiary care centres in Winnipeg. Given the tight time constraints just to get the program operating, what type of evaluation would be appropriate and feasible yet provide the managers with useful findings and results? What health care issues should the new program be focusing on? How would the managers know if the expected level of service was being provided? What impacts could be realistically attributed to the program and how could these impacts be measured and evaluated?

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This paper has been rewritten in a form suitable for classroom adoption. The case studies, from which it has been derived, are distributed in looseleaf form exclusively by Lord Publishing, 46 Glen Street, Dover, Mass. 02030, (617)785-1575.

Background

At the time of this study, the majority of the 102 Provincial and Federal hospitals in Manitoba provided only basic emergency medical services. Both of the tertiary care facilities were located in Winnipeg and in order for the rural patients to benefit from their services, interfacility transfers were required. Virtually all the transfers from the rural regions situated south and west of Lakes Winnipeg and Manitoba were performed by road ambulances while northern transfers were primarily by air (chartered or scheduled aircraft).

In 1977, the MHSC introduced the Northern Patient Transportation Program (NPTP) to assist in the transfer of medical patients. The program subsidized ground and air transportation for emergency and urgent hospital-to-hospital transfers as well as transportation costs for certain elective cases. Only northern patients were eligible.

Over the years, the costs of this program spiraled by about 35% per annum, mainly due to the increased cost of travel and the increased number of patients transferred. The program also came under criticism from several medical and paramedical groups in the Province. Their major concerns were:

- the lack of a properly designed and equipped aircraft;
- the use of ad hoc attendants, who did not have training in aero-medicine, as patient escorts;
- the potential to compromise staffing and equipment of the transferring facility when staff, sent as escorts, faced extended absence or delayed return;
- the lack of central coordination;
- only the emergency interfacility transports occurring in the northern part of the Province received subsidization yet certain areas in the southern regions faced expensive and long road transfers to reach a tertiary care centre; and
- a program designed to transport newborn babies in medical distress (High Risk Neonate Program) to intensive care units at the tertiary centres was restricted to ground transfers within an 80 mile radius of Winnipeg and needed to be expanded.

In designing the service, the managers of the Air Ambulance Program were hampered by the fact that few federal and provincial guidelines existed that would have helped define the parameters and specifications of such a program. Other air ambulance services in Canada and the United States varied greatly in the manner in which they were delivered and no standardized criteria for operation had been developed.

The medical community also disagreed on how the program should operate. Northern practitioners favoured the service being based in the North while the tertiary care centres saw the advantages of having the program placed in Winnipeg because of proximity to specialists and on-going training of staff. The managers also had to maintain an awareness of some of the political factors surrounding the air ambulance. The government was approaching the end of their term of office and wished to have the service in public view before the election. Unlike ground ambulances, the air

ambulance would be an insured service, i.e., there would be no cost to the patient. The operators of the ground ambulance services felt that the new program could substantially lower their business. Commercial airlines were also concerned that a source of revenue might disappear. Both groups had begun to lobby their respective members of the legislature.

With these issues in mind, the program had, as its primary objectives, to expand the transportation phase of the High Risk Neonate Program and to provide *emergency* medical patient transport for the whole Province. This was accomplished through the use of four components: a specifically designed and equipped aircraft (Cessna Citation "S" II); a central coordination and dispatch; trained staff (6 flight nurses, 10 pilots, specialty teams); and a central authority (Program Manager, Medical Director, Advisory Committee).

Designing a Study

At one of their first meetings, the managers decided to retain the services of a consultant to help prepare an evaluation of the fledgling air ambulance program. The consultant presented them with a plan, not to do an evaluation, but to carry out an evaluation assessment study. Its purpose would be to analyze the nature and extent to which evaluation issues should be addressed and consider options for actually carrying out an ensuing evaluation. In essence, the assessment would attempt to develop an appropriate focus for an evaluation based on the issues and needs of the decision-makers in and around the program.

The concept was new to the managers at the MHSC. It was stressed that the assessment would not make any judgements on the program's personnel, activities, or outcomes but would attempt to assess the feasibility of various evaluation approaches in meeting the informational needs of the program.

The advantages of conducting the assessment were many. By focusing the issues surrounding the program, the managers would be better able to anticipate problem areas and redirect their efforts to meet the concerns. The assessment would also help establish standards for the program based on the expectations of the user communities. With an understanding of the issues, the types of information relevant to the program could be defined and options for data collection and analysis could be presented. All of these could result in time and cost savings to the program as unnecessary or redundant issues, standards, and data could be eliminated.

The main disadvantage was that the assessment would not conduct an evaluation. Its goal would be to determine what could feasibly be evaluated and how this might be accomplished. Given the time constraints imposed on the program, the assessment would need to be done as quickly as possible.

The study was designed so that the consultant would be working directly and in partnership with a group of identified decision-makers and information users to determine the key evaluation issues and questions. The assessment was implemented in distinct segments, each complete in itself and each requiring completion prior to commencing the next phase.

Phase 1: Identification of Relevant Decision-Makers

Phase 1 identified the relevant decision-makers and information users surrounding the program. A relevant decision-maker was a person who had an interest or stake in the evaluation findings and either had the authority or power to use the findings or the ability to influence others having such power or authority. The managers were asked to identify these people from the various communities affected by the program—medical (both in the remote/rural areas, including the referring community, and the tertiary centres); administration (MHSC executives and other health standard organizations); political (MLAs from the most affected regions) and the actual operators of the program. The managers were able to identify 43 people who met the above stated criteria.

Phase 2: Understanding the Program and its Environment

Following the clarification of the decision-makers, each one was contacted and a face-to-face interview arranged. They were asked to consider the major concerns, issues, and/or questions that they believed the evaluation should address. Further, they were asked to consider the immediate concerns (the first year of program operations) and longer term concerns (one to five years of operation) as well as acceptable standards of performance and data that would reflect those standards.

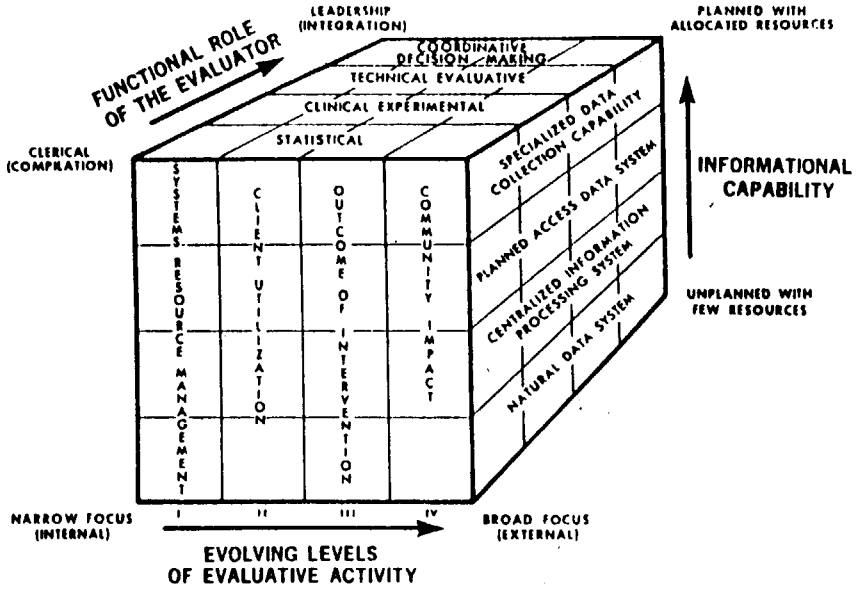
After each interview, a synopsis of the discussion was prepared and sent back to the person. He/she was asked to verify that the summary was an accurate description of their views and concerns and, if not, to make any corrections. The confirmed and/or corrected versions then became a source of information for the study. In conjunction with the interviews, a program description was developed through a review of the documentation and by observing the service in operation.

Phase 3: Focusing Evaluation Questions and Issues

Once a basic understanding of the program had been achieved and each of the identified decision makers interviewed, a summary report of the findings was forwarded to the program managers. The consultant then arranged a meeting with the managers and several top executives of the MHSC. The purpose of the meeting was to review the findings and determine what were the most pertinent issues that should form a basis for an evaluation. Only after the issues had been priorized were specific evaluation options considered.

A model of evaluative activity in a health organization was used to assist the managers in bringing the issues into focus. The model (Figure 1) was developed by Attkisson and Hargraves (1979: 53-72).

Figure 1: Model of Program Evaluation



The lower axis depicted the evolving levels of evaluative activity from a narrow (internal) focus to a broad (external) one. Its first stage, system resource management, involved management tasks such as clarifying objectives, developing plans and budgets, obtaining the necessary financial support, and monitoring income and expenditures. The typical evaluation activities linked to these tasks were: reviewing the objectives and formulating indicators of attainment; clarifying the role of the evaluator; developing improved informational capability; and assessing the monitoring and feedback efforts. Stage 11 entailed the management tasks of monitoring efficiency, assuring equity of service access, appropriate screening and utilization, and establishing a quality assurance program. Typical evaluative activities included: monitoring the count of clients served; analysing reasons for under or over utilization; assisting in medical audits; and analysing the costs.

The outcome of interventions stage involved management tasks such as providing services acceptable to the client, detecting and correcting inefficient activities, improving the cost-effectiveness, and reallocating resources to facilitate the improvements. Typical evaluative activities included: monitoring client satisfaction; comparing program outcomes to norm outcomes; studying treatment outcomes; undertaking comparative outcome experiments; and comparing cost outcomes of alternative methods of program delivery. The last stage, community impact, entailed the management tasks of participating in regional planning, developing joint interagency services and administrative systems, and the integration of services for the multi problem client. Typical evaluative activities were: assessing the community's needs; prevalence studies; participating in regional needs assessment; and

facilitating citizen and consumer input to need assessments, planning, and evaluation.

The ability of the program to evolve along the levels of evaluative activity depended upon the reliability and accessibility of its collected data. The vertical axis described the increasing levels of informational capability from an unplanned data system with few resources through to a planned data system with allocated resources. The initial stage, the natural data system, was characterized by uncoordinated and decentralized data collection which impeded evaluation by its fragmented and disconnected nature. A centralized information processing system allowed for coordinated data input and made possible a quantitative description of the program but still lacked the cohesiveness necessary for decision-making and planning. With further improvements in the data reliability, dependability, and accessibility, a planned access data system could evolve. This would increase the ability of the program to effectively evaluate its activities. The highest level of informational capability would allow the program to conduct time-limited or investigatory projects which would integrate quantitative and qualitative data.

The third axis depicted another factor that would limit the ability of the program to reach a higher level of evaluability. The more integrated the role of the evaluator in the decision-making and long-term planning, the more relevant and useful would be the results of the evaluation.

The Results

Each of the 43 people interviewed were asked to comment on three of the most important evaluation concerns facing the program from their perspective over the short term (first year of operation) and over the long term (2 to 5 years). The consultant categorized these concerns into related groupings for the managers.

The categories of first year evaluation concerns were tabulated. The priorization or categorization of the patients was the most frequently stated issue. This category broadly covered questions about how the aircraft is utilized, i.e., what type of patients are being carried and is the service being appropriately used. Who would make the decision for the transfer and how the appropiateness would be monitored were also issues under this category. The level of care concerns centered around the inflight services received by the patients. This included the nurse only transfers and the use of specialty teams when required. The response time issues focused on the time for the crew to mobilize after a call had been received and the total time it would take to make the transfer.

Education was another broad category covering issues relating to the need for more information about the goals and objectives of the program and how the service was going to disseminate the information to the potential users. Public relations concerns were also included in this category. Budgetary constraints and the reduction of the costs to the rural facilities were issues in the cost category. Staff training concerns focused on the types of skills or capabilities of the flight nurses and the on-going maintenance and improvement of those skllls.

Other short term concerns were: the maintenance and compatibility of

the aircraft equipment; the impact on the ground ambulance services; the ability of the aircraft to provide the service to the rural communities; the acceptability of the program to the medical and rural communities; the ability of the dispatch to receive and coordinate the in-coming calls; and the impact on the tertiary centres (bed utilization, manpower requirements). The concerns were further broken down by MHSC and non-MHSC interview respondents. Level of care, priorization, costs, staff training, and communications were stressed by the MHSC group and priorization, level of care, response time, education, and costs were emphasized by the non-MHSC group.

The longer term evaluation concerns were generally seen as extensions of the first year's. The expansion of the program and the possibility of feeder services using other types of aircraft was the leading concern. The decision to expand was closely linked to the second category: utilization. This included trends in the demand for the air ambulance and the ability of the aircraft to provide the service to the communities. The level of care issue in the long term shifted from an emphasis on the in-flight care to the ability of the program to improve the level of general health care in the rural regions. Other areas of concern included: equipment serviceability; re-evaluation of the audit system; concerns over staff morale and turnover rates; the long term impact on ground ambulance services; the use of specialty teams on a permanent basis; and the continued impact on the tertiary centres. There was agreement between the MHSC and non-MHSC interviews with respect to the longer term concerns.

The people interviewed were asked to suggest standards of performance for their concerns. A summary of these standards is contained in Table 1.

Using the evaluative activity model as a guideline, the managers discussed the findings of the interviews. They agreed that the first year evaluation concerns and issues generally fell into the levels of evaluative activity I and II. The management tasks suggested in level I of the model had been accomplished and most of the evaluative activities linked to those tasks had been considered. The major drawback was the development of the informational capability of program. The managers realized that they did not have the ability to centrally collect or analyze the necessary information for an evaluation. This shortcoming seriously restricted their ability to conduct an evaluation. Most of the discussion then centered upon the types of data to be collected and the methods by which the data could be processed and analyzed. In the short term, there would be a need to centrally store and process data from a number of sources (dispatch, aircraft logs, patient condition reports) and, in the long term, the program would have to access data from other institutions (referring and receiving hospitals, health claims databases).

By the end of the meeting, a clear concensus had emerged. The consultant was asked to investigate the use of a microcomputer to centralize and analyze the data requirements for the air ambulance program.

Microcomputer Applicability

Prior to looking at specific computer systems, the consultant reviewed the data requirements that were suggested in the interviews. Through further

Table 1: Suggested Standards of Performance

CONCERNS	STANDARDS
Priorization (Utilization)	Patients properly categorized 80-95% of the time at dispatch. Aircraft transfers 70-95% of all urgent/emergent cases from health facilities.
Level of Care	In-flight care at above pre-flight level in greater than 90% of the transfers. No in-flight deaths. MARN standards of nursing. Improved condition of patient on arrival at receiving hospital than before the service existed.
Response Time	2 hour response on neonatal calls. 2.5 hour total trip time on calls from Brandon. Respond within 20 minutes on 90-95% of all calls. 4 hour total trip time within the Province. 15 minute turnaround times.
Costs	Operate within budget. Comparable costs with alternative transports, e.g., charters. Improved benefit/cost ratio. Reduced costs to the rural facilities.
Staff Training	25% of time spent in a clinical setting. ACLS, ATLS, ICU, and ER Courses. Certification of training.
Equipment	Life saving procedures and equipment used in 20-40% of the flights with a minimum of an 80% success rate. Reduction in referring facility's equipment used on air transfers.
Availability	Aircraft accesses 70-95% of the airports it is planning to use. Promotion of more airports to serve the Citation.
Acceptability	60-80% positive response to the service in meeting the community's needs.

discussions wlth the managers, an essential data list was developed which included the information that needed to be collected to meet the reporting and evaluation concerns of the program. The existing data collection forms used by the program were then analyzed. The in-flight patient condition reports, flight logs, load control and passenger manifest forms, and dispatch reports were found to be sufficient to collect the data with minor alterations.

The amount of data that needed to be stored on a computer was not extensive. It was determined that most microcomputer systems with a suitable data base management software package would suffice. Further discussions with the MHSC Information Services Department did, however, reveal a number of limitations. These were:

1. The MHSC did not have a microcomputer policy at that time. Their present policy was to maintain patient information on the mainframe to ensure validity and integrity of patient data. Protocols for access to this data using a microcomputer had not been developed.
2. The Information Services did not have the capability to support microcomputers at that time. Expertise in training and technical support would have to be obtained from other departments or through commercial companies.
3. The managers and potential users of the microcomputer did not have much experience on the machines and would require training support.

Given the limitations, eight microcomputer purchase options were identified with varying degrees of cost, compatibility with the host, and expansion capability. This information was presented to the managers for their consideration.

Summary

The assessment study was described by the program managers as a worthwhile exercise which assisted the Air Ambulance Program in focusing its evaluation issues and concerns. With an understanding of issues, the managers were better able to plan their data collection needs and modify the implementation process to meet the concerns.

References

Attkisson, C. Clifford, and W.A. Hargraves. "A Conceptual Model for Program Evaluation in Health Organizations." In *Program Evaluation in the Health Fields.* Volume II. New York: Human Sciences Press, 1979. pp. 53-72.