# Hypothetical Program Evaluation Proposal for:

## *The Ontario Midwifery Program*

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## Abstract

Objectives:

This proposal describes a process and outcome evaluation of the Ontario Midwifery Program that will consist of a) a full operational review of the funding model and b) a comparative data analysis to determine the cost-effectiveness of the program.

Design:

This study will primarily use a comparative data analysis approach. Economic cost-effectiveness analysis will also be used. The sample population consists of low-risk pregnant women receiving maternity care in 2000, 2001, and 2002 in Ontario, Canada.

Hypothesis:

Midwifery care has been shown to have improved outcomes and be more cost-effective than 'equivalent' obstetric care in a variety of settings. The expectation for the current study is the same. The degree to which midwifery care has improved outcomes and is more cost-effective is yet to be determined. In the case of the process review the expected findings are more difficult to predict since a study of this type has not previously been conducted.

Outcome Measures:

The outcome measures being used for the cost-effectiveness analysis are:

- Number of prenatal visits per client
- Epidural use during labour
- Use of delivery aid devices

- Caesarean section required
- Episiotomy required
- Apgar score
- Resuscitation required
- Length of hospital stay (for all obstetric and midwifery hospital births)

Limitations:

The limitations of the study are four-fold:

1. The client viewpoint is used rather than the preferred societal viewpoint.
2. The use of Transfer Payment Agencies is a recent addition to the Ontario Midwifery Program and therefore data availability may be limited.
3. A cost-effectiveness analysis doesn't give as complete a picture of the situation as does a cost-utility or even cost-benefit analysis.
4. Comparing obstetric care data to midwifery care data may be inherently difficult.

Conclusions:

Although the Ontario Midwifery Program has never had a formal evaluation the Ontario Provincial Auditor has recommended that this is a necessary step in the near future. This proposal outlines in detail such an evaluation that covers the full spectrum of the program – both a process and an outcome evaluation.

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# Chapter 1: Literature Review

## *(a) History*

Midwifery became a regulated health profession in Ontario on December 31, 1993.[1] In 1994, the Ontario Midwifery Program (OMP) was established. One of its major functions was to act as the funding mechanism for midwifery services. To this day, the OMP is a small program, with one Coordinator, and two other staff. It is based out of the Ministry of Health and Long-Term Care's (MOHLTC) Community and Health Promotions Branch.

The field of midwifery has long been accepted as a component of the regular health care system in many countries. Indeed in France, Midwives are "on par" with Physicians and Dentists as health services professionals.[2] In North America the situation is quite different. The United States only recently adopted midwifery as part of the broader health care system. It adopted the role as a 'nurse-midwife', analogous to the now popular 'nurse-practitioner' role.

In Canada, adoption has progressed even slower. Ontario was the first province to formally recognize midwifery practice,[a] while British Columbia, Manitoba, Quebec and Alberta have all since recognized it as well. All of these provinces fund midwifery services, except for Alberta, where this process is still under review.[3] In Ontario, the *Midwifery Act* defines midwifery practice as:

> ...the assessment and monitoring of women during pregnancy, labour and the post-partum period and of their newborn babies, the provision of care during normal pregnancy, labour and the post-partum period and the conducting of spontaneous normal vaginal deliveries.[4]

[a] Midwifery care did exist prior to formal recognition, but it was not covered under the Ontario Health Insurance Program (OHIP).

In addition to practice, two other areas important to midwifery are education (i.e. training of future midwives) and research. The scope of this study is limited to midwifery practice.

### *(b) Area of Study*

Funding of midwifery services in Ontario begins with the MOHLTC allocating financial resources to the OMP. This occurs as a result of an annual operating plan submission by the OMP projecting service requirements for the entire province for the upcoming year. The OMP then distributes these financial resources throughout the province to 20 Transfer Payment Agencies (TPA).[b] Each of these 20 TPAs directly fund midwives for their practice on a per course basis (see Appendix (a) for the per course cost breakdown). The experience of the midwife affects the cost of a given course of care. To date, the effectiveness, efficiency, and accuracy of this process and funding model are undetermined.

Midwifery care has long been promoted as a cost-savings and improved outcome alternative to obstetric care. Formal regulation of midwifery was in large part a result of this – the MOHLTC saw midwifery care as an effective alternative and it was also in line with the primary care reform approach of reducing the burden of care on physicians. Although numerous studies have investigated improved outcomes with midwifery services, the results are varied and mostly depend on the model of midwifery services in place. Furthermore, in Ontario a full financial and economic review and evaluation of the OMP has not yet been conducted. An audit of the program (by the Provincial Auditor) in 2000 recommended that information be collected and analyzed to assess the quality,

[b] Transfer Payment Agencies were recently implemented in the OMP. Previous to TPAs funding allocation was governed by one central organization (similar to one large TPA for the entire province) that was established by the Midwifery Task Force as an interim measure immediately after midwifery regulation.

efficiency and effectiveness of midwifery services in Ontario.[5] This proposal directly responds to this recommendation.

An evaluation of the funding method and the cost-effectiveness of the Ontario Midwifery Program is an important step in light of current strains on the health care system and the promotion of primary care reform. Investigating this area further would allow for a better comparison of midwifery care to the traditional model of obstetric care. More superior than a cost-effectiveness study would be a cost-utility or cost-benefit analysis. Inherent in a cost-benefit analysis is also some indication of the "cost" of the health benefits of this type of care. This type of study may have to wait for a later time.

Evaluating both the funding method and the cost-effectiveness results in both a process and outcome evaluation, which is preferred over simply evaluating one or the other. Worth mentioning here is that at the time the OMP was established in Ontario regular and mandated evaluation should have been built into the operations of the program. This would have resulted in greater chances for long-term success of the program.

### *(c) Current Literature*

A number of studies have been conducted that evaluate the cost-effectiveness of midwifery care. Most of these are from the UK[6] and US, and they usually focus on either a direct cost assessment, i.e. whether or not the costs associated with midwifery services are equal to or less than that of obstetric services, or they focus on the clinical outcomes of midwifery care as compared to obstetric services.[7] Few look at both together. However, in both schools of thought – the direct cost assessment approach and the clinical outcomes approach – there is typically some brief mention of the other school of thought.

There are even fewer examples of studies that have evaluated the funding model of midwifery for a given program, in fact arguably none.[8] Yet it seems obvious that this is an important area of study since without a proper funding model, long-term cost-effectiveness cannot be expected. This is so because cost-effectiveness *follows* funding effectiveness.

What are the results of studies that have been conducted? One study that will be highlighted here reviewed the cost-effectiveness of a new model of midwifery care at a pilot site in Birmingham, England.[9] This pilot program was never adopted, not because cost-effectiveness could not be established, but because of political opposition. From this study we learn that the context in which program change should be made is critical for subsequent adoption and thus ongoing funding. In fact, the author identified four key factors in the failure of pilot schemes:

1. Lack of available funding
2. GP opposition
3. Opposition from midwives not involved in the pilot
4. Pilots *per se* not being an effective way to introduce change into maternity services

There is one previous multi-faceted evaluation of a midwifery program[10] that is of great interest and to which the rest of this section will be devoted. In 1990 the province of Quebec adopted a law that saw the formation of eight midwifery pilot programs and their subsequent evaluation. For this study, data were collected for women who received midwifery care between January 26, 1995 and July 3, 1996. The results of the evaluation were published in four separate articles as follows:

- Evaluation of the Midwifery Pilot Projects in Quebec: An Overview[11]
- Comparison of Midwifery Care to Medical Care in Hospitals in the Quebec Pilot Study: Clinical Indicators[12]

- Cost-effectiveness of Midwifery Services vs. Medical Services in Quebec[13]
- Integration of Midwives into the Quebec Health Care System[14]

Amazingly, despite the negative press, and arguably less than satisfactory results of the above studies, Quebec subsequently officially recognized the practice of midwifery which included funding of the program through the provincial health insurance reimbursement program. Therefore, it is not so much the design of the program that interests us (after all the Quebec study was for a pilot project while the Ontario Midwifery Program is an existing standing program), but rather the design of the evaluation. The key learnings here include:

- Break down the study into manageable components
- Involve a multi-disciplinary team
- Make the evaluation study known to the public
- Choose a variety of clinical outcomes indicators for the cost-effectiveness study

It should be noted that this study does not directly address the funding model for midwifery services in the Quebec pilot programs.

# Chapter 2: Problem Statement

## *(a) Research Problem*

The purpose of this study will be twofold. Firstly, a process evaluation will assess the efficiency and effectiveness of the funding model of the OMP to the 20 TPAs in Ontario. Secondly, an outcome evaluation will include a cost-effectiveness analysis of midwifery care in Ontario. The process evaluation must occur first, with a time lag before the outcome evaluation follows.

Specifically, the process evaluation will consist of a review of:

- The funding model used to generate the cost per course
- The accuracy of the operating plan submission of the OMP to the MOHLTC
- The administrative effectiveness of the funding transfer process
- The accuracy and effectiveness of the TPAs in directly funding midwifery care in their regions.

The outcome evaluation will review the following elements:

- An assessment of the effectiveness of the full spectrum of midwifery care (i.e. education/prevention, pre-natal care, labour/birth care, port-partum care, and support/counseling), based on a variety of demographic, geographic, and complexity groupings of clients
- A comparison of the clinical outcomes of midwifery care to that of traditional obstetric care based on value to the client
- A comparison of the cost of providing care with the associated benefits (outcomes)

### *(b) Definition of Terms*

The following terms have already been used or will be used throughout this proposal. They are defined here for your convenience.

*Transfer Payment Agency* – A local, non-profit organization that consists of community-based management that supports and enhances the group practice model and helps to ensure access for women who may not have had access to midwifery services in the past. Examples of TPAs include community health centres, birthing centres, hospitals, and DHCs.[15]

*Course of Care* – Midwifery services for a woman throughout pregnancy, labour and birth, and to six weeks post-partum.[16]

*Cost-Effectiveness Analysis* – A form of full economic evaluation where both the costs and the consequences of health programs or treatments are examined.[17]

*Cost-Utility Analysis* – Using an effectiveness measure in economic analysis that accounts for the resulting outcome (e.g. life years saved, QALYs gained).[18]

*Cost-Benefit Analysis* – A comparison of the incremental costs of a program with its incremental outcomes, also measured by cost (i.e. dollars).[19]

*Pareto-optimal* – Any point on the "Production Possibilities Frontier"[c]; equal to the marginal social cost of health.[20]

*Allocative efficiency* – Producing the types and amounts of goods and services which people value most; being in a situation where marginal rates of transformation in production of outputs are equal to marginal rates of substitution in their consumption.[21]

[c] The full definition of Pareto-optimal, or Pareto-efficient, is not possible within the scope of this paper. Refer to Health Economics literature for a more in-depth account.

### *(c) Paradigm and Assumptions*

Due to both the characteristics of midwifery clients and the nature of the historical acceptance of the midwifery profession, the emancipatory paradigm will be utilized for this evaluation. The fact that only women are clients, and often those from under-served populations and demographics makes this choice a requirement of sorts. Further, in terms of the economic analysis, the viewpoint of the client will be taken. Although a societal viewpoint is preferred[22] it has been deemed infeasible at this point in the lifecycle of the program. A future study taking a societal perspective would be of great benefit.

The major assumption that will be necessary for the success of this evaluation is that the outcome indicators for midwifery care are measurable, and can easily and accurately be evaluated in terms of effectiveness. Measurability of these indicators has not yet been proven in the Ontario context.

Other assumptions include:

- There are a limited number of different complexities of courses of care and these can easily be grouped
- Data and outcomes for home versus hospital births are available and comparable
- Data from traditional obstetric care for low-risk pregnancies are available and comparable (from OHIP billings database)
- A finite list of improved outcomes indicators is a good measure of the effectiveness of midwifery care

All of these assumptions will be taken into consideration during the research and analysis stages of the evaluation of the Ontario Midwifery Program.

# Chapter 3: Methodology

## *(a) Research Questions and Hypothesis*

The overall objective of this study will be to a) conduct a full operational review of the funding model of the Ontario Midwifery Program and b) to perform a comparative data analysis to determine the cost-effectiveness of the program. Table I includes research questions for further investigation in this study resulting from the literature review in this area.

*Table I. Research questions for investigation*

| Funding Effectiveness | Cost-effectiveness |
|---|---|
| 1. How was the funding formula for midwifery services in Ontario determined?<br>2. What other funding formulas exist for midwifery services worldwide and what are their pros and cons?<br>3. Why was the TPA model chosen?<br>4. What alternatives to the TPA model exist?<br>5. Are midwife salaries in line with global levels for industrialized countries? Do they require review?<br>6. How can funding planning for midwifery services be combined with funding planning for obstetric services? | 1. What are the current costs for providing obstetric care for low-risk clients? For midwifery care (both in and out of hospital)? Are these appropriate?<br>2. What are the current administrative costs associated with midwifery care provision and how do these compare to obstetric care administrative costs?<br>3. How can the validity of the outcome measures for maternity services be verified?<br>4. Are midwifery services provided in an allocatively efficient (or Pareto-optimal) manner? |

## *(b) Research Design*

The design of the two components of this quantitative economic evaluation will be described separately, hereafter referred to as the “process evaluation” (funding effectiveness) and the “outcome evaluation” (cost-effectiveness). The process evaluation will consist of:

- A systematic literature review of current models of funding of midwifery programs worldwide and a comparison of these to the Ontario context and current model using TPAs
- A financial analysis of the current model of funding for the OMP using standard managerial accounting principles
- A review of the processes surrounding the funding mechanism for midwifery services in Ontario to include:
    - The operating plan submission procedure by the OMP to the MOHLTC
    - The method of transfer of monies from the OMP to the TPAs
    - The system for direct funding of midwifery courses of care by the TPAs
    - The formulas for funding requests by the TPAs to the OMP
- An examination of the TPA structure to determine their effectiveness in the overall process of midwifery funding in Ontario

The outcome evaluation in turn will be a comparative data analysis comprised of the following:

- An analysis of the full cost of providing midwifery services using OMP, TPA and midwifery service provider budgets from the previous two years
- An analysis of the full cost of providing 'equivalent' obstetric care to low-risk pregnant women using historical data from the OHIP billings database for the previous two years
- A comparison of the costs associated with midwifery care to that of obstetric care
- An investigation and comparison of the outcomes associated with midwifery care and obstetric care using results recorded directly on the client's chart and based on the following outcome measures:
    - Number of prenatal visits per client
    - Epidural use during labour

- Use of delivery aid devices
- Caesarean section required
- Episiotomy required
- Apgar score
- Resuscitation required
- Length of hospital stay (for all obstetric and midwifery hospital births)

### *(c) Sample Description*

The population from which data will be collected includes all pregnant women who used midwifery or obstetric care in Ontario between 2000 and 2002 that were classified as “low-risk”. Both in hospital and out of hospital births will be considered for women cared by midwives, but data from this subset will only be used for the appropriate outcome measures. Out of hospital births will be considered in the financial analysis. Since this research involves human subjects a review by the University’s Ethics Review Board is necessary prior to approval of this proposal.

The above sample applies to the outcome evaluation only. In terms of the process evaluation a population isn’t being studied, but rather the process involved in the delivery of the OMP.

### *(d) Measures*

The outcome measures that will be used are as detailed in section b) above, Research Design. Reliability and validity of these measures is always of great concern. Reliability of the data at hand is assumed to hold true given that the data are coming from client charts and the OHIP billings database. Although validity is more difficult to ensure than reliability, in the case of the outcome measures being used to study cost-

effectiveness of the OMP confidence should be high. These outcome measures have been used time and time again to study the effectiveness of midwifery services in programs in a variety of countries. This was conclusion was captured by the thorough literature review for this study.

### *(e) Data Collection Procedures*

Data will be collected for the process evaluation by the researcher(s) as well as administrators of the OMP, TPAs and local midwifery practices. These data will be collected for budgets submitted for the 2000, 2001 and 2002 MOHLTC fiscal years. For the outcome evaluation data collection will occur via standard chart audits for the midwifery care clients. Standard database queries will be used to extract the required data from the OHIP billings database. The time periods for data extraction for the outcome evaluation will be approximately the same as that of the process evaluation in order to provide a standard comparison between the two components of the evaluation. Data quality will be ensured through periodic and random quality checks by an observer outside of the study.

### *(f) Data Analysis Procedures*

In general standard managerial accounting and corporate finance procedures will be used for the economic and financial analyses. Data analysis for the outcome evaluation will be comprised of a standard statistical analysis using the SPSS software package. Sensitivity analysis of the data will also be conducted to observe variation under different conditions.

### *(g) Limitations of Study*

There are four main limitations of this study. Although they appear to be rather significant, they are both manageable and acceptable given the current lifecycle of the OMP. Many of these can only be addressed in a second evaluation study that should be conducted in about 3 years time.

The limitations are:

5. The client viewpoint is used rather than the preferred societal viewpoint.
6. The use of TPAs is a recent addition to the OMP and therefore data availability may be limited.
7. A cost-effectiveness analysis doesn't give as complete a picture of the situation as does a cost-utility or even cost-benefit analysis.
8. Comparing obstetric care data to midwifery care data may be inherently difficult.

### *(h) Research Transfer*

Utilization of the results of this study is of paramount importance, as is the case with any evaluation study or other forms of research.[23] Immediate transfer of the results to both the OMP and MOHLTC is obvious, but others can also gain from the results. Other stakeholders include:

- The Ontario obstetrics community
- The TPAs and their clients (i.e. the local midwifery practices)
- The Ontario public, specifically including pregnant women
- Other midwifery programs in Canada and abroad

### *(i) Time-Lines*

As noted in previous sections the timelines of the data to be used is the 2000, 2001 and 2002 MOHLTC fiscal years. As for the study itself it is expected that the data collection for the process evaluation will occur between November 2002 and January 2003. The data collection for the outcome evaluation will begin in February 2003 and end in June 2003, in order to be able to have full data for the 2002 fiscal year. Analysis of the data for both components of the evaluation will follow the data collection stage. The results are expected to be ready for publication in late 2003.

# Appendices

Appendix A – Fees associated with a billable course of care

| Experience Level | + | Fixed Component | = | Fee per Course of Care |
|---|---|---|---|---|
| Year 1 $1375 | | $575 | | $1950 |
| Year 2 $1425 | | $575 | | $2000 |
| Year 3 $1475 | | $575 | | $2050 |
| Year 4 $1525 | | $575 | | $2100 |
| Year 5 $1575 | | $575 | | $2150 |
| Year 6 $1625 | | $575 | | $2200 |
| Year 7 $1675 | | $575 | | $2250 |
| Year 8 $1725 | | $575 | | $2300 |
| Year 9 $1775 | | $575 | | $2350 |
| Year 10 $1825 | | $575 | | $2400 |
| Year 11 $1875 | | $575 | | $2450 |
| Year 12 $1925 | | $575 | | $2500 |

The fixed component consists of:
- Operating costs
- Ongoing capital costs
- Equipment costs

The following are reimbursed separately:
- Travel expenses
- Cell phone usage
- The use of a second attendant for birth
- Malpractice liability insurance

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