The Relationship between Outcomes and Midwifery models

THE RELATIONSHIP BETWEEN OUTCOMES AND MIDWIFERY MODELS

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A thesis submitted in partial fulfillment of the requirements of Thames Valley University for the degree of Doctor of Philosophy

April 2010

ABSTRACT

Since the 1970s attitudes towards childbirth have been changing as a result of women's and midwives' desire for a more natural approach. In response, a variety of new models of midwifery have been introduced. This thesis assesses the appropriateness of midwifery as a model of maternity care and explores the differences between models of midwifery and their relationship to the birth experiences of women and babies. Although models from multiple countries were studied, the Alberta model, which resulted from legislation to recognize the profession of midwifery in Canada, provided the main focus to the exploration.

The Relationship between Outcomes and Midwifery Models (ROMM) was conducted in three parts: 1) a literature review and exploration of the results of the published evaluations of 15 new models of midwifery that were compared with existing models; 2) a reanalysis of descriptive data collected for the Implementation of Midwifery Services Evaluation Project (IMSEP) in Alberta, Canada for selected outcomes and stratified by planned birth setting and 3) a comparison of the published results of the evaluations of three western Canadian models; a hospital midwifery demonstration programme in Alberta, the regulated midwifery model in Alberta (IMSEP) and a regulated midwifery model in British Columbia.

To facilitate the exploration, a typology based on the identified midwifery elements of partnership, continuity, autonomy, community and choice and an associated scoring system to quantify the degree to which models contain the elements were developed. A process of visual representation to explore aggregate findings from multiple evaluations of models was also introduced. These tools were shown to have potential as research or appraisal instruments following further development and evaluation.

The ROMM shows that midwifery can be integrated into health services safely with good outcomes and satisfaction for women, implying that Canada should introduce midwifery more widely and recognize it as a mainstream profession. In addition an authentic model of midwifery is proposed, based on the midwifery elements described and explored in this thesis. The

existence of a positive relationship between authentic midwifery models as described in this thesis and birth experiences and outcomes is suggested as a hypothesis for further research. The potential influence of situational factors such as where and when a model is practised, the case mix of clients and birth settings as mediators of such a relationship was also noted.

The implications are that if midwifery is to continue to effectively enable women to achieve optimal birth experiences efforts should be made to 1) attract midwives with the attitudes and motivations that are conducive to an authentic midwifery model as described here, 2) provide supportive infrastructures for an authentic model of practice and 3) ensure midwifery education programmes prepare midwives to practise in such models. Further research is needed to refine and test the prototype typology and scoring system and to validate the use of visual representation to explore relationships between models and outcomes. The relationship between the authentic model of midwifery and birth outcomes suggested by this thesis is hypothetical and rigorous testing is needed before the correlation of models and outcomes can be validated. The effect of situational factors on outcomes also needs further study.

Acknowledgements

The completion of a doctoral degree is never an individual achievement. There are many people who have contributed to enabling me to complete this thesis and I am truly grateful to each of them.

I would like, first and foremost, to thank my Director of Studies, Professor Christine McCourt, who provided guidance and a most outstanding example of excellence in scholarship throughout the lengthy development and writing of this thesis. I would especially like to thank her for always finding a way to accommodate my needs within her demanding schedule. Without Chris, this thesis would not have been completed.

I am also deeply grateful to Dr. Beverly O'Brien, my external supervisor, for her leadership in the IMSEP evaluation and her generosity in sharing her knowledge and insight into the complex world of midwifery research in a challenging Canadian environment.

To my colleague, friend and fellow student, now Dr. Debbie McNeil, my sincere thanks for her encouragement, commiseration and statistical advice and especially for her careful reading of my draft thesis. Her support was invaluable.

My heartfelt thanks go to all the midwives who contributed in many ways to making legalized midwifery a reality in Alberta, especially those who accepted an invitation to lunch and found themselves participating in a focus group. Many thanks also go to the women and families who supported the recognition of midwifery in Alberta.

To Irene, Ali, Kathy, Hasen, Ayesha, Qayum, Shirley, Steve, Shaheen, Ron and Anisa who have unwaveringly sustained me with encouragement, friendship and good food, I will be eternally grateful.

Lastly, to my family, Gerald, Julie, George Carl and Selina, I cannot thank them enough for their ongoing love and support throughout the years.

Dedication

In Memory of My Mother

Alice Gray

Special Lady

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INTRODUCTION

Chapter 1: Introduction to the Relationship between Outcomes and Midwifery Models

On July 2nd, 1992, a small group of midwives watched from the public gallery of the provincial legislature in Alberta, Canada as an order in council was passed that amended the Health Discipline Act by adding midwifery to the list of health disciplines regulated under the Act. Although this event caused little more than a passing mention in the local press (Alberts, 1992), to the midwives in the gallery it was a momentous occasion and almost beyond belief as it meant that, for the first time ever, their profession would be legally recognized in the province. For me, as one of those midwives, it was also the event that precipitated my quest to understand what midwifery is and how receiving care from midwives influences the birth experiences of women.

The aim of this thesis, titled the Relationship between Outcomes and Midwifery Models (ROMM), is to address questions related to the effects of different models of midwifery on the birth outcomes and experiences of women and babies who receive care from midwives. The model of regulated midwifery that resulted from the 1992 legislation is used as starting point to describe selected birth outcomes for women receiving care from midwives registered in Alberta following the introduction of the newly legislated model. The ROMM also begins a process of defining the elements which make up the Alberta model and classifying other models of midwifery based on the degree to which they contain those elements. The ROMM further identifies differences in selected birth outcomes which could be accounted for by the identified midwifery elements, either separately or in combination and whether situational factors play a role in affecting birth outcomes when women and babies receive midwifery care in different models.

1.1 Background

The journey of midwifery in Canada, from indigenous women helping each other to give birth to professional midwives fully integrated into a modern heath care system, provided a unique opportunity to study a variety of styles

of practice, as midwifery changed and grew. First Nations'[1] midwives have birthed babies in Canada since the dawn of time and developed many traditions and beliefs around the process of childbirth. The new Canadians, who came from Europe in the late 1800s, did not integrate with the aboriginal peoples. As pioneers they were isolated in a wilderness with little or no access to medical care. When births occurred, neighbour women helped each other (Mason, 1987) and some became skilled and recognized as expert birth attendants (Bourgeault, 2000). With the growth of towns and later cities, hospitals were built and a need to fill them and provide patients for the developing medical profession's education was recognized. As a result, women were encouraged to go to a hospital to have their babies and medicalized hospital childbirth became the accepted standard of care (Mason, 1988, Connor, 1989). A few courageous expert birth attendants continued to provide childbirth care to women but, as there was no role for midwives in hospitals, all births took place at home. These expert birth attendants, who became known as empirical[2] midwives (Mason, 1988), were considered by the medical community as unsafe practitioners who were little better than witches and they were driven underground (Barrington, 1985).

A "consumers' revolt" (Oakley, 1984 p. 236) in the 1960s and 70s resulted in a desire for birth without drugs or interventions and an increase in the popularity of planned home births and midwifery care around the world. Canadian consumers took part in the movement by lobbying for the option to receive legalized midwifery care and birth at home with a skilled birth attendant. Empirical midwives and some maternity nurses, many of whom were foreign trained midwives unable to practise in Canada, joined with the women to petition for legalization of midwifery.

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[1] For the purposes of this thesis First Nations refers to aboriginal peoples inhabiting Canada before the arrival of colonists.

[2] Empirical' is a word commonly used in Canada for midwives who lack formalized training in preference to the term 'lay' which many midwives consider to be derogatory.

To address the safety and feasibility of midwifery in Canada, several demonstration midwifery projects were set up across the country during the 1980s and 1990s (Harvey et al., 1995). Midwifery practice in these projects was, of necessity, limited in scope due to the lack of recognition of midwifery. However, with Canadian home birth practices and the experience of other models existing or being tested around the world, these projects provided excellent background information on which to begin developing a Canadian model of midwifery. Unlike other high-income countries where consumers and midwives were struggling to change existing models of midwifery that did not meet their needs, Canada was in the enviable position of being able to start from scratch and select or develop a model to suit the specific needs and preferences of Canadian women and midwives

The resultant Canadian midwifery legislation provides an infrastructure for autonomous; self-regulated midwives to provide primary midwifery care that is community-based and rooted in a philosophy that is woman centered and supports a woman's right to make informed choices related to her childbirth experience. This model was endorsed by Canadian women and their families and is now considered a model of 'true' midwifery[3] by Canadian midwives (Relyea, 1992). It has also been recognized internationally as a model to aspire toward (Bourgeault et al., 2004, Van Wagner, 2004).

The need to evaluate midwifery in Alberta became evident to health care authorities when midwifery legislation was introduced. Prior to the legislation the small number of midwives who did practise did so without legal sanction or access to the resources and support systems available to recognized heath care providers. Consequently, midwives could only provide care to women and babies in the midwives' office or the mothers' home. They had no access to hospitals, diagnostic services, pharmacy services or other resources essential to provide safe, effective midwifery care. As a result of this lack of recognition and resources, midwifery practice was covert and practised out of sight and without external scrutiny. Interactions between

[3] The concept of true midwifery and how it is applied to the Canadian model is introduced in Chapter 3.

midwifery and the health care system only occurred when problems were encountered and midwives needed to seek medical help in an emergency situation. Some of these situations ended in tragedy and midwives found themselves in court facing charges of neglect, incompetence or practising medicine without a licence. Some mothers who sought midwifery care were accused of child abuse (Hopkins, 1990). In general fear and mistrust abounded in health establishment circles and the image of a 'granola-crunching granny midwife' practising something which closely resembled witchcraft was a common interpretation of an Alberta midwife. Even when the midwives were practising in hospital pilot projects, other care providers complained of not knowing what midwives were "up to" when they were with their clients behind closed doors.

As the Alberta provincial government prepared for the regulation of the profession of midwifery under its new legislation a decision was made to set aside $400,000 to fund an evaluation of the integration of the newly recognized profession and to bring together a group of stakeholders to plan for an appropriate evaluation. In July 1998 a Midwifery Fund Allocation Committee was convened consisting of a government representative, representatives of the 5 health regions that anticipated having practising registered midwives in their jurisdictions and representatives of the Alberta Association of Midwives.

Representatives on the committee who were government officials or executive officers of the participating health regions were particularly interested in knowing the impact of integrating midwifery on existing health service agencies and providers and the overall economic implications. In addition, they were interested in documentation of the historical role of their agencies in development of the infrastructure to support the profession of midwifery. The representatives of medicine were interested in the potential financial burden of introducing a new health care practitioner and as their association was officially opposed to home birth, due to safety concerns, they were interested in clinical outcomes. Midwife representatives believed that midwives practising in Alberta would encounter some resistance to their integration and were interested in how resistance would be manifest and if

strategies to break down barriers to their integration could be identified. Finally, all the committee members were interested in various aspects of the experience of women receiving care from registered midwives and how satisfied women would be with care they received.

As a result of the deliberations of the committee I, and another practising midwife (B. O'Brien) with research experience, were approached and invited to submit a proposal for an evaluation project. The resulting proposal for the Integration of Midwifery Services Evaluation Project (IMSEP) was approved and recommended to the government by the committee and subsequently approved for funding. By 2001, all legislative changes necessary for the regulation and administration of midwifery as a profession in Alberta were complete and midwives began providing a full scope of maternity care in four of the province's 17 health regions. The evaluation began at the same time registered midwives began practising and although no public funding was available for midwifery services generally, midwives were compensated for services they provided to women in the IMSEP through the research grant.

Although the Albertan IMSEP study of newly registered midwives (O'Brien et al., 2004) is central to this thesis, my interest in the Canadian model of midwifery preceded it, having evolved during 20 years of providing care to childbearing women and contributing to the movement to enable legal midwifery in Canada. Ten years before the IMSEP research, this interest had led me to be well positioned to play a substantial role in the introduction and management of the Foothills Midwifery Programme (FMP), which was one of the hospital demonstration projects designed to test the feasibility and efficacy of midwifery in the Canadian healthcare system. The demonstration model of practice was designed to adhere as closely as possible to the unregulated home birth model that was used and accepted by the midwives and women of the province at that time. However, lack of home birth as an option, the supervision of midwives by physicians and the imposition of medical standards were unavoidable due to the status of midwifery at the time. My role as principal investigator of a randomized controlled trial of the FMP, designed primarily to establish the safety of hospital midwifery practice, provided my first opportunity to study a model of midwifery as the trial

measured outcomes of midwifery care and compared them with the outcomes of physician care. The results of the trial clearly supported the safety and effectiveness of this restricted model of practice and more favourable outcomes were found for midwifery care than for physician care (Harvey et al., 1996, Harvey et al., 2002). The results supported the claims of researchers and practitioners of other midwifery models internationally that mothers and babies who received midwifery care were as safe as those who received care from other practitioners (Cragin, 2002, Buhler et al., 1988, Blais and Joubert, 2000, Brown and Grimes, 1993, Butler et al., 1993, Davis et al., 1994).

The IMSEP research that evaluated newly legislated midwifery in Alberta was my second opportunity to study a model of midwifery. I participated in all aspects of preparing the proposal, conducting the research and writing the final report. However, because of my particular interest in how a midwifery model could result in different birth outcomes compared to a medical model, I assumed a leadership role for the component of IMSEP that was concerned with descriptive data for maternal and neonatal outcomes, interventions and processes. In this role I was responsible for providing leadership for the component of the evaluation that addressed the safety and efficacy of care from registered midwives. My role included being responsible for the assembling, developing and piloting of the survey questionnaires, providing clinical expertise for the entry of survey data and the interpretation and reporting of the quantitative results. Other Investigators provided leadership in the areas of qualitative data collected by focus groups and interviews and comparative clinical and economic data available from provincial records. Expertise in statistical and economic analysis and computer technology was also provided by appropriate co-investigators.

As the IMSEP progressed so did my interest in how midwifery care might affect birth outcomes. Increasingly, internationally published research, reporting on studies comparing newly introduced models of midwifery with existing models was suggesting that newer models resulted in improved outcomes for mothers and babies (Flint and Poulengeris, 1987, Kenny et al., 1994, McCourt et al., 1998, Sandall et al., 2001b). Over time, a question

which had been germinating in my mind for some time took root and began to demand to be answered. The question was related to whether different models of maternity care were responsible for different clinical outcomes and, more specifically, could differences in outcomes truly be accounted for by the differences between care provided by midwives and care provided by physicians, as appeared to be the case in the RCT I had previously conducted in Alberta (Harvey et al., 1996, Harvey et al., 2002). I further wondered whether, if midwifery care resulted in different outcomes than medical care, was it possible that different models of midwifery resulted in different outcomes and were there other factors which might affect outcomes when midwifery care was provided to women and babies.

Later, when the results of an evaluation of newly regulated midwifery in the neighbouring province of British Columbia, The British Columbia Home Birth Demonstration Project (HBDP), began to be published (Janssen et al., 2006a, Janssen et al., 2002) another opportunity to study a western Canadian model of midwifery practice presented itself. The history of the rebirth of midwifery is similar in Alberta and British Columbia in that British Columbia also had a pilot in-hospital nurse-midwifery program in the 80s and 90s and passed legislation to recognize midwives one year after Alberta. Both midwifery models were similar, being based in the Canadian model. In addition, some of the IMSEP data collection tools had been designed to be congruent with those used in British Columbia to facilitate the comparison of data. The Alberta IMSEP study compared a model of midwifery with physician care and the British Columbia HBDP study compared in-hospital and out-of-hospital groups for a model of midwifery with each other and with physician care.

1.2 Genesis of the Research Questions

The overall aim of the ROMM study was to gain an understanding of what midwifery is and if it differs from one model to another thus contributing to different birth experiences for women depending on the model of midwifery care received. The second overall aim was to discover other factors which may affect a woman's birth experience when she receives midwifery care. A

summary of the ROMM in terms of the questions used to guide the research and the processes used to achieve the aims is presented in Figure 1.1.

Summary of ROMM Thesis	
Research Questions	**Process Steps**
1. What are the outcomes of selected variables for women and babies that receive midwifery services in Alberta?	**One.** Reanalysis of IMSEP data to generate descriptive statistics for selected outcomes **Two.** Literature Review and Exploration
2. How satisfied are women who receive midwifery services in Alberta?	**One.** Reanalysis of IMSEP data to generate descriptive statistics **Two.** Literature Review and Exploration
3. Are there differences in selected outcomes for women and babies when care is provided by midwives in different models of midwifery but in the same geographic location?	**Three.** Comparison of two Alberta models of midwifery
4. Are there differences in selected outcomes for women and babies when care is provided by midwives in similar models of midwifery but in different geographic locations?	**Four.** Comparison of one Alberta and one British Columbia model of midwifery.
5. Are there differences in selected outcomes for women and babies when care is provided by midwives in similar models of midwifery but in different birth settings?	**Five.** Analysis of IMSEP data for selected outcomes stratified by birth setting. **Six.** Comparison of Alberta and British Columbia models by intended hospital or out-of-hospital birth.

Figure 1.1

As a first step in achieving the aims of ROMM the IMSEP evaluation data were reanalysed to produce descriptive statistics for selected outcomes of the Canadian model of midwifery, as implemented in Alberta, which was used as the core midwifery model for the ROMM. The outcomes which were found to be different between midwifery and medical models in Alberta when the FMP trial was conducted were selected to focus the ROMM as they were theorized to be more sensitive to the affects of a model of care. The outcomes were 1) Amniotomy, 2) Antepartum ultrasound, 3) Epidural, 4) Intravenous infusion in labour, 5) Labour Stimulation, 6) Length of Hospital Stay, 7) Perineal integrity, 8) Type of Birth, 9) Ultrasound Examination, 10) Admission to neonatal intensive care, 11) Apgar score 12) Birthweight and 12) Satisfaction.

The two research questions of the IMSEP study that referred to clinical outcomes were revised for the ROMM to address the selected outcomes as follows:

1. What are the outcomes of selected clinical variables for women and babies that receive midwifery services in Alberta?
2. How satisfied are women who receive midwifery services in Alberta?

The second step was a broader and more in-depth review of the literature for the ROMM study than had initially been conducted for the IMSEP research. Following this second literature review, a classification system was developed to categorize the strength of published midwifery models based on elements of the Canadian model. To enable the classification system to be developed the elements which make up the Canadian midwifery model in the Alberta midwifery regulations (Government of Alberta, 1996) were redefined, to clarify their meaning and to bring them into line with nomenclature being used in the international literature. The literature was then further explored using the classification system and a process of visual representation developed to enable the exploration. The purpose of the exploration was to further characterize the relationship between models of midwifery and birth outcomes.

The third step built on the background understanding of the relationship between models of midwifery and the selected outcomes gained for models in the literature and the Canadian model in the first two steps. It involved comparing the two Alberta models of midwifery I had been involved with for the same outcomes selected for the first two steps. A third question was, therefore, added to ROMM as follows:

3. Are there differences in selected outcomes for women and babies when care is provided by midwives in different models of midwifery but in the same geographic location?

The potential to consider whether similar models of midwifery practised in different geographical locations might also influence clinical outcomes afforded by the publication of the HBDP findings was intriguing. A fourth step comparing the similar Alberta and British Columbia models and the following fourth question were therefore added to the ROMM:

4. Are there differences in selected clinical outcomes for women and babies when care is provided by midwives in similar models of midwifery but in different geographic locations?

This fourth question and the recognition in step two that some situational factors may have the potential to affect outcomes prompted me to consider whether other situational factors might also affect birth outcomes when midwifery care is received. The published results of the HBDP included outcomes for midwife attended home and hospital births and caused me to wonder if birth setting might be another situational factor that could have an effect on birth outcomes and add a fifth question to ROMM:

5. Are there differences in selected outcomes for women and babies when care is provided by midwives in similar models of midwifery but in different birth settings?

The fifth step in achieving the aims of the ROMM study, therefore, was analysis of the IMSEP data stratified by intended birth setting for the selected outcomes and the sixth step was comparison of the outcomes for the Alberta IMSEP and the British Columbia HBDP for hospital and out-of-hospital births as planned by women at the onset of labour.

The western Canadian evaluations which were scrutinized are the Randomized Controlled Trial of the Foothills Midwifery Programme (FMP) (Harvey et al., 1996, Harvey et al., 2002) conducted between 1992 and 1994, the Evaluation of the Home Birth Demonstration Project (HBDP) (Janssen et al., 2006a, Janssen et al., 2002) conducted between 1998 and 1999 and the Implementation of Midwifery Services Evaluation Project (IMSEP) (O'Brien et al., 2004, O'Brien et al., In Review) conducted between

2001 and 2003 and are presented in Table 1.1.

Compared Western Canadian Evaluations					
Province	**Author**	**Models of Care**			
		Midwife Hospital	**Midwife Home**	**Midwife Birth Centre**	**Physician**
Alberta	Harvey et. al. (1996)	X			X
British Columbia	Janssen et. al. (2002)	X	X		X
Alberta	O'Brien et. al. (2004)	X	X	X	X

Table 1.1

Unlike the examination of published evaluations undertaken to seek a relationship between models of midwifery and outcomes where a lack of adequate description of the models was a severe limitation to recognizing the effects of models on outcomes, the western Canadian models were well known to me, having practised in two of them and been associated with the implementation process of the third. In addition, the intentional use of many of the same outcome measures was expected to facilitate a more effective comparison. The comparison provided a beginning insight into which elements of the Canadian midwifery model affected which outcomes and whether other factors might also affect outcomes when midwifery was being practised.

1.3 Rationale for ROMM

The long history of midwifery, practised only outside the health care system in Canada (Barrington, 1985, Eberts et al., 1987, Kitzinger, 1988a), resulted in a situation where midwifery came to be considered, by influential, authoritative bodies, as a potentially dangerous practice that put the safety of mothers and babies at risk (Lakritz, 1997, Walker, 1983, Walker, 1998). Legislation, enabling a professional model of midwifery to be implemented resulted, partly, from the evaluation of demonstration models of midwifery, which were shown to be safe, efficacious and satisfying to women (Buhler et al., 1988, Kaufman and McDonald, 1988). However, the model of midwifery evaluated in the demonstration projects was limited by the unregulated and unrecognised status of midwifery at the time they were implemented.

Consequently, important elements of midwifery were perforce omitted (Harvey et al., 1995). In the demonstration models, midwifery was practised only in hospital with the final responsibility for the midwives practice resting with physicians.

In Alberta, the results of a randomized trial of the FMP demonstration model were accepted as evidence that this restricted model was an acceptable alternative to physician care (Harvey et al., 1996, Harvey et al., 2002). However, the question of whether the same would be true when midwives practised under their own responsibility in all settings remained omnipresent. The ROMM study has the potential to provide a significant contribution to answering the outstanding question of the merit of the new regulated model in Alberta as an alternative option to the standard maternity care available in the province. Knowing that outcomes of the full Canadian model compare favourably with those of the restricted demonstration model, will go far in allaying extant fears concerning out-of-hospital birth and the safety of care by midwives, thus providing evidence to support the appropriateness of birth attended by a registered midwife as a safe option for Alberta women.

The need for an evidence based understanding of the impact of integrating the new profession of midwifery in Alberta was clearly identified by the committee of stakeholders set up to decide the best way to use government funds set aside to support the integration of midwifery. The need for reliable, local evidence was confirmed by the government by its funding of IMSEP. The ROMM evidence is central to the acceptance and support of midwifery in Alberta. It is also essential to impending government decisions about public funding of midwifery services and the development of a midwifery education programme in Alberta.

Over the last twenty years, Canada has not been alone in introducing a new model of midwifery. The same movement to humanize birth, that resulted in the recognition of a model of midwifery in Canada resulted in numerous new or revised models being introduced in many parts of the world (Waldenstrom and Turnbull, 1998). The importance of evaluating the new models has been widely recognized and in some instances research has been conducted to

compare the new models with existing standard or traditional models. Evaluation of new models remains a priority even today and a recently published systematic review of 11 randomized trials, which compared newly introduced midwife-led models with other models of care for childbearing women, concluded that midwife-led care confers benefits for women and shows no adverse outcomes (Hatem et al., 2008). However, the authors acknowledge that questions remain and that further research is needed. In particular, they identify a need to study more recently developed models of care that include home birth. The ROMM study will contribute to this needed research by comparing selected clinical and birth experience outcomes for the new Canadian model, stratified by birth setting, in two locations. Similarly other factors which may affect a woman's birth experience, such as geographic location will be better understood. Greater understanding of how important external factors affect a woman's birth experience when care is provided by midwives will provide valuable information for policy makers and healthcare providers as new models of midwifery are introduced both in Canada and around the world.

A number of challenges to evaluating newly introduced models of midwifery care have been identified. The defining of complex interventions, such as models of midwifery, is an essential requirement when evaluating them (Campbell et al., 2000). Nevertheless, the need for greater description of intervention and standard models of care has been noted in evaluations that have been conducted (Hatem et al., 2008). That defining complex interventions is difficult (Campbell et al., 2000) has undoubtedly contributed to the dearth of good definition. The difficulty has been compounded by a paucity of research into the fundamental nature of midwifery. In more recent years, some seminal work has begun identifying the elements that constitute midwifery (Kennedy, 2000, Pairman, 1995) but they are not well understood and no accepted generic typology is available. Neither is there any process developed to measure the degree to which an element exists within a specific model. This thesis will contribute to simplifying the definition of models by adding to the knowledge of the elements which make up models of midwifery through the review and clarification of the mandated

components of the Canadian model. In addition, the prototype of a process for measuring the degree to which each element is present and the combined strength of all elements within a given model, developed as part of the thesis, will suggest direction for the quantification of models for further research and evaluation.

Another challenge to evaluating midwifery has been difficulty in aggregating data from multiple studies (Waldenstrom and Turnbull, 1998) because of heterogeneity in the choice of outcome measures collected and reported across various evaluations (Hatem et al., 2008). More strategic targeting of outcomes is needed, based on the degree to which an outcome needs to be assessed (Mannheim, 1998). Recently, some efforts have been made to develop core minimum data sets which may prove useful for standardizing outcome measures used for the evaluation of models of midwifery (Aikins Murphy and Fullerton, 2006, Devane et al., 2007, Janssen et al., 2006b). This thesis will add to the understanding of problems related to heterogeneity of outcome measures by concentrating on a small number of selected outcome measures, which are among the most commonly used. A well designed, consistently used, defined and measured, minimum dataset will facilitate aggregating data from multiple studies and conducting reliable meta-analyses (Hatem et al., 2008).

In addition to adding an understanding of fundamental elements of midwifery and contributing ideas regarding the definition of models and measurement of outcomes this thesis will provide direction and focus for future research into midwifery, its models of practice and the effects of elements of midwifery on the birth experience of women and babies

1.4 Organization of the Thesis

The six process steps of the ROMM study are organized in three parts:1) Literature Review and Exploration of the Relationship between Models of Midwifery and Birth Outcomes; 2) Description of Selected Outcomes of Regulated Midwifery In Alberta, Canada and 3) Comparison of Selected Outcomes of Three Western Canadian Models of Midwifery. The three parts evolved as work progressed on an original proposal to describe selected

outcomes of newly regulated midwifery in Alberta. Consequently, they were not conducted in strict sequential order and often overlapped. The three parts are, therefore, presented in the order which best allows for the logical development of the educed understanding of the relationship between outcomes and models of midwifery.

Part 1 is concerned with seeking a relationship between formally evaluated models of midwifery and selected birth outcomes chosen for their potential to be affected by the style of maternity care received by childbearing women and their babies. In Chapter 2, how the Canadian model of midwifery evolved from the birth practices of the First Nations people to the model practised by regulated midwives today is described. The Canadian model is then used as a basic model against which to classify other models of midwifery in the remainder of this thesis. In Chapter 3 elements that make up the Canadian model are discussed and described. In addition, a system of classification, developed to further examine how individual and combined elements of a model may potentially affect outcomes, is introduced. Selected outcomes to be used in the subsequent exploration of the relationship between midwifery models and outcomes are also identified and defined. In Chapter 4 classification of the evaluated models using the system introduced in Chapter 3 is described and a series of visual representations used to seek potential relationships between the elements of midwifery and the selected childbirth outcomes is provided.

In Part 2 a description of selected outcomes of regulated midwifery in Alberta, Canada is presented. In Chapter 5 the design and methodology of the IMSEP is described. An overview of the entire evaluation is presented to provide an understanding of the context in which the ROMM was conducted. A more detailed account is provided of those areas of the evaluation that relate directly to description of selected outcomes that is part of the ROMM study. In Chapter 6 a full account of analysis and findings of IMSEP is presented for those outcomes that were selected for description as a part of ROMM.

Part 3 is concerned with building on the understanding gained in Part 1 and Part 2, regarding the relationship between midwifery models and outcomes by comparing selected outcomes of three western Canadian models. In Chapter 7, the three Canadian models and research which has been conducted to evaluate them are described. In Chapter 8 the selected outcomes of the three models of practice are compared to add understanding of the complex interaction between the elements of midwifery and situational factors and their independent or combined effect on outcomes, interventions and processes of care provided to women and their babies. This is accomplished by comparing of the effects of models of midwifery when two Canadian models that are categorized to score high and low for the elements of midwifery they contain are implemented in the same geographic location and when the same high scoring model of midwifery practice is implemented in different geographic locations and in different birth settings.

In the final two chapters a conclusion to the thesis is presented. In Chapter 9, the findings of the study, the value of the classification and visual representation processes used in the study and the study's strengths and limitations, are summarized, reflected upon and discussed. In the discussion a model of authentic midwifery is hypothesized and a continuum of models of midwifery reflecting their strength in the elements of authentic midwifery is postulated. In chapter 10, conclusions from the ROMM, its relevance for the midwifery profession and the practice of midwives together with recommended directions for future research are presented.

PART ONE: LITERATURE REVIEW AND EXPLORATION OF THE RELATIONSHIP BETWEEN MODELS OF MIDWIFERY AND BIRTH OUTCOMES

Part 1 is concerned with seeking a relationship between formally evaluated models of midwifery and selected birth outcomes chosen for their potential to be affected by the style of maternity care received by childbearing women and their babies.

In Chapter 2, how the Canadian model of midwifery evolved from the birth practices of the First Nations people to the model practised by regulated midwives today is described. The Canadian model is then used as a basic model against which to classify other models of midwifery in the remainder of this thesis. In Chapter 3 elements that make up the Canadian model are discussed and described. In Chapter, 4 a system of classification, developed to further examine how individual and combined elements of a model may potentially affect outcomes, is introduced. Selected outcomes to be used in the subsequent exploration of the relationship between midwifery models and outcomes are also identified and defined. In addition, classification of the evaluated models is described and a series of visual representations is used to seek potential relationships between the elements of midwifery and the selected childbirth outcomes.

Chapter 2: The Evolution of the Canadian Model of Midwifery

This chapter describes how the Canadian model of midwifery changed from the birth practices of First Nations and Inuit peoples of North America to the model practised by regulated midwives today in 2009.

2.1 The Canadian Model of Midwifery

The practice of midwifery in Canada, as in the rest of the world, dates back to the beginning of human life (Mason, 1987, Harvey, 1992, Kitzinger, 1988b). Although the essence of midwifery has changed little over the millennia, the model by which midwives have provided care to women and families has changed as society has evolved. The term "model of midwifery" is one that has been coined only relatively recently and is generally used to describe the way service is organized and infrastructure is implemented to facilitate the service.

2.1.1 The First Nations Model

The indigenous birth culture among the various First Nations peoples of Canada was based in birth knowledge and attitudes that were hopeful in nature and reflected the spiritual nature of their beliefs (Relyea, 1992). Birth was a community event and most communities had a few women, experienced in attending childbirth, who were recognized as birth attendants or midwives (Mason, 1988). Close, long-term kinships existed between midwives and the women and families they cared for due to the community nature of birth. Often the midwife who received a baby into the world would have an allomother type of relationship with the child which was lifelong (Rita Dozois cited in Mason, 1987). Midwives attended the birthing woman wherever she gave birth and in a quiet, peaceful manner waited patiently for birth to occur which it most often did with the midwife catching the baby and intervention rarely being needed. Although they used no instruments, midwives in a number of First Nations peoples had extensive knowledge of herbal medicine which they used effectively (Waldram et al., 2006). In addition to the midwives, most of the women in a community also attended births as birth-helpers. Birth-helpers supported the woman by, for example,

stroking her when she was in pain, singing softly or encouraging her to work with the midwife.(Rita Dozois cited in Mason, 1987)

2.1.2 The Neighbourhood Model

When the European settlement of eastern Canada began in the 1700s some pioneers were midwives trained in their home countries. The women of a community elected a midwife as a member of the community's health care system (Kerr and McPhail, 1988) and she was paid a salary by the King of France (Relyea, 1992, Laforce, 1990) or, later, by the British government but these methods of payment were soon discontinued (Mason, 1987) and women whose primary function was midwifery became rare.

As more pioneers arrived and settlement spread across the country from east to west, communities became more isolated resulting in the need to develop a new culture of family and neighbour support. The sharing of the birth event became an important factor in the strengthening of family bonds and establishing of links among families newly arrived from foreign lands (Mason, 1988). Midwifery adopted a structure of neighbours helping neighbours similar to that of the existing, indigenous populations.

As with the First Nation's peoples, a birthing woman was surrounded by other women she knew and who shared her life situation. Birth was a woman's community event and would take place in the mother's home. Women waiting for the birth would often knit clothes or make quilts for the anticipated baby. Some women, who were perceived to have expertise, were particularly sought out to help with birth. They were women who had their own children but their training in midwifery was derived solely from being a part of a culture in which most adult women were expected to help one another with childbearing and childrearing (Mason, 1987). Many gained a degree of expertise from old medical books or trial and error as well as from experience. These first Canadian midwives' primary function remained running their own households but when called upon, they provided midwifery care that was patient and non-interventive as well as material and social, often staying at the mother's home for a number of days to help with household duties like baking bread and caring for children. In return for

assistance at birth the women would be recompensed with produce, help with farm work, building a house or even attendance at her own subsequent births, which were the usual currency of communities at that time (Mason, 1987, Armstrong and Feldman, 1986, Bourgeault, 2000).

Although the neighbourhood model of midwifery continued to flourish in rural areas, women of a new urban class of society in the emerging towns and cities of eastern Canada began to lose confidence in their ability to give birth with only the help of neighbours (Bourgeault, 1996). In addition to the change in outlook of women, the popularity of doctoring as a profession was an increasing influence in the provision of health services (Mason, 1987). Nevertheless, midwifery was well rooted and continued to flourish until the 1860s when the practice of midwifery came under threat from a strong and continuous effort by doctors to forge themselves into a unified profession with a monopoly in midwifery (Mason, 1987). Their claim to the sole right to practise midwifery was legitimate as the first Canadian Act to regulate the practice of medicine, which was passed in 1795, made it illegal to practise physic, surgery or midwifery without a medical licence (Barrington, 1985).

Physicians continued to tolerate midwives in general until the number of physicians increased to the extent that it became difficult for them to earn a living and they began to recognize midwives as a threat to their incomes (Relyea, 1992). In 1874, the first Canadian College of Physicians and Surgeons began to receive complaints from its members of loss of remuneration to midwives and the College began to prosecute midwives as unsafe, unlicensed, medical practitioners (Ehrenreich and English, 1973) while promoting what were described as physicians' scientific, technological practices, thus contributing to the demise of the neighbourhood midwife (Barrington, 1985) .

Midwives were unable to organize to mount a defensive campaign due to lack of formal education, geographic isolation from each other and the numerous other demands of life as a pioneer woman. In addition, they lacked the social connections of class enjoyed by medical practitioners (Tyson et al., 1995). Simultaneously, urban upper class women, following the example of

European queens in seeking physician attended birth (Shaw, 1947), began to popularize birth attended by doctors (Barrington, 1985). After World War I, the availability of innovative techniques such as induction of labour, anaesthesia and instruments for separating the baby from the mother, which were only available when care was provided by doctors, was seen as desirable for the modern Canadian woman (Mason, 1987, Michinson, 1991, Rushing, 1988, Radcliffe, 1947). By the end of the nineteen century physicians were attending more births than midwives (Bourgeault, 1996) with only one sixth of births being medically unattended in 1897 (Barrington, 1985). As a result of these various pressures the practice of midwifery was virtually non-existent in Canada by the end of the 1930s (Sandall et al., 2001a).

2.1.3 The Hospital Model

As the medical profession grew and strengthened it was inevitable that hospitals also flourished and physicians found it more convenient to conduct births in the hospitals than to attend women in their homes (Michinson, 2002). The recognition of medical science as the source of power for maternity care professionals enabled doctors and hospitals to take control of the management of birth (Wrede, 2001). Women were encouraged, through pamphlets, journals and visiting nurses, to come to the hospital for their births and put themselves in the hands of the doctors and nurses who would ensure their safety (Mason, 1988). Consequently, hospital birth became the choice for middle class women most of whom were already receiving health care from doctors (MacDonald, 2004). The extra cost of hospital birth was prohibitive for most women until in 1948 the introduction of universal hospital coverage brought about an end to the financial disincentive of hospital birth. In addition, community health nurses offered free layettes to women who birthed in hospital and hospital birth rapidly became the accepted norm for most women (Harvey et al., 1995).

The First Nations Model of midwifery persisted longer than the Neighbourhood Model due to the isolation and marginalization of these populations and their reluctance to embrace medicalized birth (Barrington,

1985). However, a large scale campaign by the government to increase the numbers of doctors and nurses in northern and isolated regions in the 1950s to deal with tuberculosis, which was rife, resulted in the expansion of medical services generally, including maternity care and the gradual acceptance of hospital birth by Indian and Inuit peoples (Plummer, 2000). The widespread hospitalization of childbirth completed the near demise of the Neighbourhood and First Nations midwives (Eberts et al., 1987) and the annihilation of the community nature of birth and the lifelong relationships developed during midwife attended births at home.

With the Hospital Model of care women received physical care during pregnancy from a physician, either a family doctor or an obstetrician (Eberts et al., 1987). Most appointments took place in the physician's private office where routine tests, such a weight and urine testing, were done by a nurse but more specialized tests or procedures required the woman to go to a laboratory or hospital. In addition to the nurses in the physician's office women received prenatal education from community health nurses or privately organized groups.

Arrangements between physicians for shared care meant that a woman received care from several physicians during her pregnancy and may not have seen the physician who delivered her baby before the time of her birth (Eberts et al., 1987). Nurses who worked in labour and delivery rooms provided care to a woman during labour and informed the physician of her progress.

Labour and delivery nurses also assisted the physician at the delivery. After a one to two hour stay in the delivery room the mother and baby were transferred, the mother to the postpartum unit and the baby to a nursery where their care was transferred to other nursing staffs (Eberts et al., 1987). A woman and her baby were visited daily by an obstetrician, paediatrician or family practitioner, as appropriate, for the duration of their hospital stay. Following her discharge from hospital a mother received visits from public health nurses for a few days. At about 6 weeks after birth, mother and baby

made a final visit to a physician or two physicians if the mother's physician was not the same person as the baby's physician.

Women birthing in hospitals became completely isolated from their community at the time of birth sometimes needing to travel hundreds of kilometres to hospitals located in major urban centres. The feeling of isolation was compounded for women as an attempt to decrease high rates of puerperal fever and related mortality associated with hospital birth, resulted in stringent rules being imposed in the name of preventing sepsis (Mason, 1988, Loudon, 2000). Visiting by family and friends was restricted during the hospital stay and prohibited in the labour and delivery areas. The doctors and nurses providing care at birth were practically unseen behind their gowns and masks. The birthing woman was shaved, douched, swabbed and purged during labour and at the time of birth her lower body was covered in drapes to provide a sterile environment for the baby to be born into (Mason, 1988). The mothers' wrists and ankles were buckled to the delivery table with leather straps to prevent her from moving them into the sterile field and contaminating it. The use of antibiotics in the 1930s radically reduced the seriousness of infection but the practice of aseptic technique continued.

During the years when midwifery was not legal in Canada many foreign trained nurse-midwives, mostly British, who immigrated to Canada and found that they were not able to practise legally as midwives, turned instead to nursing in obstetrical wards. Although these nurses were never formally acknowledged as midwives, their advanced knowledge and skills in maternity care were well recognized (Barrington, 1985) to a point where from the 1960s they were sought after to work in maternity units and paid a premium rate of salary according to the nurses union contract if they had a midwifery certificate from a bona fide secondary educational institution (The United Nurses of Alberta, 2007). Recognition of their skill did not result in allowing them to provide care outside the hospital model and many were unhappy with the restricted nursing role.

This Hospital Model of care which isolated a mother from her community and family and separated her from her baby flourished in Canada until the 1980s

birth movement which resulted in a relaxation of the rules of aseptic technique, the care of the mother and her newborn baby in the same room, improvements to continuity of care in the labour and delivery unit and discharging of the mother and baby from hospital in 48 hours or less of birth, which are now the norm in many hospitals. Nevertheless, although many improvements have been made, the Hospital Model of care has remained provider-driven, fragmented and compartmentalized (Kitzinger, 1998, Jarrell, 1990).

2.1.4 The New Midwifery Model

Although midwifery as a separate profession had no legal status in Canada for more than a century, midwives were never entirely extinct (Eberts et al., 1987). A few brave women continued to practise without legal status within the old Neighbourhood Model particularly in tightly knit, ethnic communities (Sandall et al., 2001a) despite the fact that they could be prosecuted. Although some were charged with practising medicine without a licence none were ever convicted (Barrington, 1985).

By the 1950s when hospital birth had been the norm for a generation, a rising interest in simplifying life and avoiding institutions underpinned the growth of a desire for a more natural approach to birth, that during the 1960s and 1970s, spread across the United States and Canada (Sandall et al., 2001a) causing women to desire to regain control of their bodies and to seek alternatives to medicalized birth (Martin, 1987, Davis-Floyd, 1992, Pilley Edwards, 2005). Some women sought caregivers who would enable them to be genuine participants in their childbirth experiences in a way that was not possible in the hospital model (Harvey et al., 1995). Due to the demise of the neighbourhood midwife, parents began to look for other aids to birthing safely at home and using manuals and medical texts books to rely on their own resources (Mason, 1987). As the demand for home birth grew, women who had experience of home birth (Barrington, 1985) began to augment their experience by attending weekend workshops, observing and coaching labouring women in hospitals or attending at courses outside the country and offering themselves as assistants at home births and emerging as the first

new midwives. Although the number of midwives practising within the New Model of midwifery was small their support network swelled to thousands and formed the base from which the groundswell to recognize midwifery as a profession arose (Gaskin, 1989).

Unfamiliar with the traditions of the old neighbourhood midwives the new midwives redefined midwifery as a mixture of old art, modern science and new age insight (Barrington, 1985). Training for the new midwives, most of whom had no previous experience of midwifery although some had trained as nurses, was self motivated and self directed. They learned where they could, seeking out any remaining neighbourhood midwives or hospital nurse-midwives to learn the sensitive diagnostic touch that has always been the midwife's most essential tool and borrowing herbal recipes and ancient wisdom from native and ethnic midwives (Barrington, 1985). Unlike their predecessors, these new midwives were often very well educated and able to avail themselves of current childbirth research literature (Kaufman, 1998).

In the early years of the New Midwifery Model, the illegal status of the profession meant that the secret of their services was cautiously passed among friends (Gaskin, 1989) but as time passed and consumer support grew, their activities became more open (Harvey et al., 1995). The initial covert nature of the practice resulted in midwifery evolving in similar ways across the great expanse of Canada (Barrington, 1985). Although geographic, social and cultural issues defined how a midwife worked locally, all adhered to a model of midwifery based on the philosophy that only a mother can deliver a baby and the role of the midwife is one of being "with woman"[4] in an egalitarian relationship during her childbirth experience (Barrington, 1985). Many of the new midwives' clients were their friends and their style of practice was friendship-oriented, relaxed and comfortable

[4] The word midwife is derived from the old English "mid wyf", the modern translation for which is "with woman" and is understood by midwives to be reflective of the midwife's role in accompanying the woman on her journey through pregnancy and childbirth into motherhood (NEW ZEALAND COLLEGE OF MIDWIVES (2007) Partnership. http://www.midwife.org.nz/index.cfm/1,91,html Accessed January 15, 2008.)

(Bourgeault, 2000). Prenatal visits were irregular, lengthy and took place in the mother's or the midwife's home and included information and advice giving. Many of the birth practices of the neighbourhood midwives were revived in the New Model with friends and relatives, including husbands or partners, attending and providing support, encouragement and practical help. Like their predecessors, new midwives not only provided care for the mother by supporting the natural birth process and limiting intervention but also cared for other children, prepared food or cleaned up after the birth, sometimes staying overnight, if needed. Midwifery care continued after birth with the midwife calling at the mother's home for months or sometimes years after the birth and with most parents who had received midwifery care becoming strong supporters in the lobby to legalize midwifery. Payment for midwifery services was usually based on ability to pay and was sometimes waived or took the form of barter (Barrington, 1985).

When two or more midwives practised in proximity with each other they often joined to form a cooperative and backed-up each other but each continued to be a primary care provider for an individual caseload of women. Occasionally, a physician who supported home birth also provided medical back up and facilitated access to resources such as laboratory tests. As the demand for midwifery grew, more women began to enter midwifery by apprenticeship resulting in the need for more predictable scheduling to accommodate the apprentice's education (Gaskin, 1989). By the 1970s this had resulted in some midwives setting up clinics in their home, at the cooperative or other office and in a few cases, in midwife operated birth centres.

2.1.5 The Demonstration Model

Although the number of midwives remained small the number of nurses working as obstetrical nurses in hospitals grew. Less than satisfied with their role and frustrated by not being able to provide the option of midwifery services to women they cared for (Harvey and Rach, 1998), they became aware that if midwifery was to be recognized as an appropriate model of care for Canadian women, a way needed to be found to show that it could be a

viable option. By 1981, this need for visible midwifery practice had spurred the implementation of three demonstration projects in hospitals across Canada, where influential senior administrators and physicians could be found (Jarrell, 1990, Berenyi, 1996) to help obtain support, approval and sometimes funding for the pilot midwifery projects (Harvey et al., 1993, Harvey, 1992). The first demonstration project was the Grace Hospital Midwifery Program (GHMP) in Vancouver, British Columbia; the second was the McMaster University Medical Centre Midwifery Project (MUMCMP) in Hamilton, Ontario and the third was the Foothills Midwifery Programme (FMP) in Calgary, Alberta. As midwifery was still not recognized in Canada, these demonstration projects were made possible by obtaining approval from physician associations and licensing bodies and various hospital committees for nurses to function as midwives. They carried out the delegated medical acts of assisting at birth, assessing the newborn, cutting and repairing an episiotomy if needed and administering oxygen on their own judgement. Physicians remained ultimately responsible for the care of the women and could be present, change a midwifery decision or assume direct responsibility for care at any point (Harvey et al., 1995).

Two pilot projects (GHMP and MUMCMP) were staffed by nurses who were trained as midwives overseas but in the third (FMP), three of the eight nurses, who made up the midwifery team, had no formal midwifery education. The programme was opened to all labour and delivery nurses so as not to discriminate against Canadian nurses for whom midwifery education was not locally available. A careful selection process of volunteers and a 10 month midwifery education programme were implemented to ensure necessary midwifery knowledge and skills.

Finding a title for the nurses providing midwifery care in the demonstration projects proved tricky as the term midwifery was generally understood, in Canada, to refer to illegal practice in unsafe locations. As the major objective of the projects was to demonstrate safe midwifery and to raise its profile it was considered important to call the practitioners in the programmes midwives, even though it would have been less controversial to call them nurses. In seeking a solution to this dilemma the term nurse-midwife was

considered as an alternative. Although there was no formal recognition of nurse-midwifery in Canada, the term was well known due to the proximity of the United States where nurse-midwifery was a recognized and regulated profession. Consequently, the term had been used in Canada to describe nurses who have obtained midwifery qualifications overseas. Many midwives and their supporters felt strongly that Canadian midwifery should ultimately be independent of nursing and medicine and that using the term nurse-midwifery set a dangerous precedent. Eventually, each programme solved the problem in their own way depending on their unique circumstance and in all projects team members were referred to as midwives, nurses or nurse-midwives as circumstances changed throughout the duration of their projects. To differentiate them from home-birth midwives, demonstration project midwives are referred to as nurse-midwives in this thesis.

The goals of all the demonstration projects were to promote alternatives to the existing medical model of care; to provide care that was responsive to the needs of childbearing women, to increase the job satisfaction of obstetrical nurses and, most importantly, to raise the profile of midwifery (Harvey, 1992, Harvey, 1990). The demonstration projects enabled women who chose hospital birth to experience midwifery care but did not provide for the option of home birth due to the persisting, widely-held belief that a hospital was the only safe place to give birth (Harvey et al., 1995, Burtch, 1994). In each of the three projects the nurse-midwife was the expert practitioner in the care of healthy childbearing women. The approach to midwifery was characterized by the promotion of the normal processes of pregnancy and childbirth through the avoidance of routine technology and unnecessary interventions. As all demonstration projects were implemented in university–affiliated, tertiary care centres, where strict hospital protocol was adhered to and the use of obstetric technology and medical intervention were routine, advocacy was, of necessity, a major component of the midwives' role. The care was designed to be woman-centred, responsive to individual needs and based in a philosophy of continuity of care throughout the childbearing cycle (Harvey et al., 1995, Rice, 1988).

The concept of continuity of care was developed for the Demonstration Model as the nurse-midwives were employees of the hospitals and the employment contract was not flexible enough to enable the kind of schedule needed for continuity of caregiver (The United Nurses of Alberta, 2007). With continuity of care, a team of nurse-midwives shared a caseload and practised from a consistent philosophy of midwifery developed by the team and based on their collective beliefs and values. Clinic schedules, duty rosters and home visits were scheduled to enable a woman to meet all of the nurse-midwives prior to the birth, whenever possible, to ensure a known nurse-midwife at the birth (Harvey et al., 1995). Nurse-midwives held regular, frequent team meetings to pass on and discuss information unique to each woman and held monthly teas attended by as many nurse-midwives as possible where women and families could come to meet and socialize with the nurse-midwives and with each other. The intention was for the woman to receive consistent care from and develop trusting relationships with a small group as care from a consistent caregiver was not obtainable.

Although the projects were all implemented in stages, when fully up and running nurse-midwives provided care to women throughout the childbirth cycle. Women who were assessed by a physician at their initial screening visit to be low risk were cared for by nurse-midwives throughout the antepartum, intrapartum and postpartum period with generally only one other physician visit required at 36 weeks gestation (Harvey et al., 1995). Prenatal education classes were provided by nurse-midwives to various degrees depending on the project. Each project had an in-hospital clinic space where routine antepartum and postpartum visits were conducted. Additional visits were carried out at home including a preparation for hospital birth visit, early labour and early postpartum visits. Hospital stays were kept as short as possible with a standard stay ranging between 6 hours and 48 hours. When women and their babies remained in hospital for more than a few hours after birth they were cared for by nursing staff with nurse-midwives visiting at least once daily. The projects accepted between 70 and 300 women a year and ran between 8 and 12 years. All three projects reported accrued outcome data or results of formal evaluations which demonstrated the high quality of

the care resulting from the implementation of the Demonstration Model (Harvey, 1996, Grace Hospital Midwifery Program, 1993, Kaufman and McDonald, 1988). One demonstration project (FMP) was evaluated by a randomized trial which will be discussed further in Part 3 of this thesis. The three nurse-midwifery demonstration projects remained active and popular until the regulation of midwifery in their respective provinces..

2.1.6 The Regulated Model

The first Canadian province seriously to consider introducing midwifery legislation was Ontario (Tyson et al., 1995). There were a number of reasons why the decision was made to give legal recognition to midwifery in Ontario. Interest in midwifery had been growing for some time with 61% of pregnant women surveyed in 1988 expressing a desire to see midwifery legalized (Soderstrom et al., 1990). Many women had come to believe that the existing, male dominated medical model of care, in which birth was regarded as a potentially pathological event, could be improved on by midwives who would provide more holistic care and see pregnancy and birth as normal, healthy events (Eberts et al., 1987, Tyson et al., 1995). In addition, the number of unregulated midwives practising in Ontario was noticeably growing and midwives and women were becoming increasingly more effective in communicating their case for recognition of midwifery to the government and the public. Finally, in 1985, a coroner's jury recommended that midwifery be granted legal recognition and become incorporated into the health care system after an inquest into a baby death following a midwife attended home birth (Eberts et al., 1987, Kaufman, 1998). A government appointed Health Professions Legislative Review Commission set up to overhaul existing health professions legislation provided a vehicle for reform including the legalization of midwifery (Sandall et al., 2001a, Kaufman, 1998).

In January 1986, Ontario Health Minister Murray Elston announced the government's intention to establish midwifery as a regulated profession in the Ontario health care system. He created a Task Force on the Implementation of Midwifery in Ontario to recommend a framework for the practice of

midwives. A model of midwifery or "how midwifery should be practised in Ontario" (Eberts et al., 1987 p. 11) was the first item in the task force's mandate.

The lack of legal recognition of midwifery in Canada led to a unique situation. Midwifery models in most countries developed over long periods of time and became entrenched as traditional models. However, in Canada the decision to recognize midwives as health professionals meant the model to be practised could be deliberately selected and implemented, thus taking advantage of the available evidence and experiences of the past to develop the most appropriate midwifery model for the Canadian situation. As a result the Canadian model which was eventually developed was a complex blend of indigenous, local, provincial, national and international models that would be admired as a source of inspiration and ideas about how to improve maternity care in other locations around the world (Bourgeault et al., 2004, Van Wagner, 2004).

The Task Force on the Implementation of Midwifery in Ontario gathered background information by consulting widely, holding public meetings and receiving over 500 submissions. It assembled an extensive collection of literature and conducted two surveys. In addition, Task Force members visited midwifery schools, practices and regulatory bodies in several countries where midwives functioned autonomously with clearly defined roles in the health care system as well as where midwives had difficulty functioning to their full potential and found their roles threatened or not yet fully realized (Eberts et al., 1987).

In its final report published in 1987, the Task Force does not clearly define the term "models of practice" but does discuss models within a chapter entitled *The Framework of Practice* implying that the model is a part of the overall framework of midwifery practice. The Task Force suggested that no single model should be imposed on all communities or all midwives only that every practice model be structured to maximize the safety and effectiveness of midwifery care. The Task Force identified eleven important characteristics of midwifery which are summarized in Figure 2.1. It went on to recommend

that the government only approve and fund midwives who would practise in a model of midwifery which was based in these characteristics.

Characteristics for Canadian Midwifery Models
Continuity of care is provided
The midwife's responsibilities include counselling, education and emotional support
The midwife has access to both institutional and community settings
The midwife has arrangements with physicians for consultation and referral and for ordering medications, tests, and procedures
The midwife practises autonomously within her scope of practice
The midwife focuses on low risk pregnancies and normal childbirth
The midwife has an opportunity to engage in continuing education and peer review
The midwife's working conditions are reasonable and she is fairly paid
The practice is responsive to consumer needs and preferences
The practice continuously evaluates its effectiveness
The care provided is cost effective

Figure 2.1 (Eberts et al., 1987 p. 93-94)

The Task Force further recommended that the definition of a midwife be consistent with the World Health Organization international definition of a midwife (World Health Organization, 1992) and her practice be made up of the nine basic elements adapted from a European Community Midwives Directive (80/155/EEC) which are summarized in Figure 2.2.

Elements of European Midwifery
establishing and monitoring normal pregnancies
identifying pregnancies at risk
counselling and educating the pregnant woman
caring for and advising the woman and monitoring the condition of the foetus during labour
conducting spontaneous vaginal deliveries
recognizing signs of abnormality in mother and infant and making referrals to physicians
examining and caring for the newborn infant
caring for the woman during the postpartum period and advising her on infant care and family planning
taking emergency measures in the absence of a physician

Figure 2.2 (Eberts et al., 1987 p. 86)

The government of Ontario, with the support of midwives and consumers, accepted the recommendation of the Task Force to recognize midwifery as a health service with registration of practitioners, standardization of practice and implementation of educational programmes (Kaufman, 1998). The recommended essential themes of the Ontario midwifery practice model would be: informed choice, continuity of care, choice of birth place, time spent with women, appropriate use of technology and a non-authoritarian relationship with women (Tyson, 2001) thereby retaining the essence of the existing, New Midwifery Model of practice (Bourgeault, 2000). The draft legislation was presented to the government in 1987 but it took until 1994 for necessary working arrangements, payment agreements, modification of companion legislation, creating a regulatory college and establishing educational programmes to be completed and the Midwifery Act to be proclaimed (Government of Ontario, 1991).

Overnight the standards developed by the newly created College of Midwives of Ontario came into effect and registered midwives could provide care on their own responsibility, order specific laboratory and diagnostic imaging tests, obtain hospital privileges, sign birth certificates, consult with other professionals and receive payment from public funds. Under contract with the government a practice group of midwives would share the

responsibility for the prenatal, intrapartum and postnatal care of an annual caseload of up to 40 births per midwife and receive a caseload contingent funding allocation to cover direct midwifery payment and overhead. Each midwife would carry professional liability insurance and participate in peer review (Kaufman, 1998). Sixty midwives were initially registered in Ontario and by 1998 the number had risen to 136 and by 2008 to well over 300. A four-year degree programme operated by a consortium of McMaster, Ryerson and Laurentian Universities was established with a curriculum that included basic sciences, social sciences, health studies and midwifery knowledge. Students would need to attend 60 births, conduct at least 40 of them as primary care provider and have contact throughout pregnancy, birth and the postpartum period for at least 30 births to satisfy the registration requirements (Kaufman, 1998).

The Canadian Public Health Association endorsed the recognition of midwives in Ontario and recommended legislation and funding to support an independent, self regulated profession of midwifery in all provinces and territories of Canada (Canadian Public Health Association, 1995). The Canadian Midwifery Regulators Consortium (CMRC) recognized the Ontario midwifery model, as one built on a foundation of autonomous, individualized, primary care provided by safe, skilled midwives in the community in a context of continuity of care provider. In 2001, the CMRC adopted it as the model for its national reciprocity agreement (Canadian Midwifery Regulators Consortium, 2001) thus recognizing it as a basic model for all of Canada.

2.1.7 The Alberta Model

The route which led Alberta, the province where the research central to this thesis took place, to be the second Canadian province to pass legislation recognizing midwives was similar to that of Ontario (James and Bourgeault, 2004) with midwifery evolving from women helping each other. During the early days of settlement on the prairies women considered, "childbirth was a time of sisterhood ... based on a bond central to their lives as homestead women: they were women and they were needed" (Langford, 1995 p. 299) and they were the only ones available to help.

In 1980 only six midwives and their apprentices were known to be practising in Alberta. They were organized into two cooperatives, one each in Edmonton and Calgary; the two major urban centres in the province and one midwife in a single, rural practice. All were providing care using the New Model of midwifery described above in 2.1.4. Each cooperative was supported by and worked with one of the two family physicians in Alberta who still attended home births (Toane, 1981). As well as the two supporting physicians, at least two consumer groups, the Association for Safe Alternatives in Childbirth (ASAC) and the Calgary Association of Parents and Professionals for Safe Alternatives in Childbirth (CAPSAC) provided support to midwives and lobbied for their legal recognition (Association for Safe Alternatives in Childbirth and Calgary Association of Parents and Professionals for Safe Alternatives in Childbirth, 1981).

Nurses with midwifery qualifications from other countries had also sought support for their unrecognized profession by adopting the descriptor of nurse-midwife and coming together in groups to network, commiserate and collaborate. Alberta nurse-midwives made up about one half of an approximately 30 member group, the Western-Nurse Midwives Association (WNMA) founded in 1973 (Association of Midwives of Newfoundland and Labrador, 2007), which brought together nurses with recognized midwifery qualifications from the four western provinces of Canada, namely British Columbia, Alberta, Saskatchewan and Manitoba. The nurse-midwives were generally fulfilling nursing roles in hospital and felt unable to challenge the status quo, thus, inadvertently, if not directly, supporting the existing situation by practising within the predominant Hospital Model of care (Relyea, 1992).

Although both midwives and nurse-midwives desired recognition of their professions, they did not in any way recognize or communicate with each other. Midwives believed nurse-midwives had capitulated to the hospital model and were not true midwives and nurse-midwives considered the empirical midwives to be irresponsible for jeopardizing the safety of their clients by practising illegally.

In 1981, the College of Physicians of Alberta passed a ruling which prohibited physician involvement in elective home births. This event affected the existing practice of midwifery as it meant that physicians who attended home births or worked with domiciliary midwives would almost certainly lose their licences (Toane, 1981). Reluctantly, both physicians discontinued attendance at home birth and withdrew their support of midwives. At approximately the same time, an overhaul of the process of regulating health disciplines other than nursing and medicine, which had their own acts, resulted in the enactment of a Health Disciplines Act that did not include midwifery. Feeling their practice to be under threat, the midwives founded an association, the Alberta Council and Register of Domiciliary Midwives Association (ACRDMA) as a platform from which to seek recognition in legislation. In 1982 ACRDMA applied to the Health Disciplines Board for the designation of domiciliary midwifery as a health discipline under the Health Disciplines Act (Alberta Midwifery Health Discipline Committee, 2002). The Health Disciplines Board ruled against ADCDMA's request on the grounds that domiciliary midwifery is a subset of the larger occupation of midwifery. The Board stated that it believed it would not be in the public interest to partition the discipline. However, the Board added that "this recommendation should not be seen to bias an investigation of the total occupation of midwifery if an application is ever received" (Alberta Midwifery Health Discipline Committee, 2002 p. 1-1-1).

Although the WNMA had actively opposed the ACRDMA's application to the Health Disciplines Board (Government of Alberta, 1992), the domiciliary midwives, heeding the recommendation of the Board, reluctantly approached the nurse-midwives about working together to explore the possibility of joining forces to pursue recognition. During four years of negotiation it took to come to an agreement the nurse-midwives became impressed with the empirical midwives' commitment to midwifery and willingness to challenge the system by continuing to practise against all odds. They also recognized that by merging with the domiciliary midwives they would gain the support of ASAC and CAPSAC and, potentially, achieve a much more autonomous model of practice than they had previously thought possible. The empirical

midwives, for their part, recognized that the nurse-midwives would make a strong ally in the lobby for legalized midwifery because of their legitimate role and knowledge of the established health care system. In 1986, the two groups merged to form the Alberta Association of Midwives (AAM) which in 1989 applied to the Health Disciplines Board for recognition as an autonomous profession under the Health Disciplines Act (Alberta Midwifery Health Discipline Committee, 2002). In 1990, a few nurses began practising nurse-midwifery in the FMP, one of the demonstration projects, described in 2.1.5 above, but they aligned themselves with the domiciliary midwives and were not members of the WNMA as some of them had no recognized midwifery qualifications and they sought, in the long term, a model that was based in midwifery as opposed to one based in nurse-midwifery. When the demonstration project discontinued in anticipation of the imminent legal recognition of midwifery in the province, those nurse-midwives joined the domiciliary midwives in attending home births using the New Midwifery Model, described in 2.1.4 above, even though a domiciliary midwife had been charged with illegally practising medicine. As in Ontario, the resulting court decision furthered the movement to legalize midwifery when the judge not only found the midwife not guilty but recommended the regulation of midwives (Hopkins, 1990, Williams, 1992, Williams and Levy, 1992, Moysa and Aikenhead, 1991).

By 1991, the Heath Disciplines Board had completed its investigation into whether it would be in the public interest to recognize midwifery and recommended to the Alberta Government that midwifery be a designated health discipline under the Health Disciplines Act. The Government felt that the Board had identified several issues that required further study before it could make a decision regarding designation and established a Midwifery Services Review Committee (MSRC) to examine these issues. The committee drew heavily on the work of the Ontario task force. In 1992, the report of the MSRC was tabled in the Legislative Assembly and Midwifery was designated as a Health Discipline under the Health Disciplines Act (Alberta Midwifery Health Discipline Committee, 2002).

The Midwifery Regulation Advisory Committee (MRAC) was established in 1993 to develop Midwifery Regulations and Standards of Competency and Practice and implement a multifaceted assessment process for assessing the ability of individuals interested in becoming midwives to meet the standards for registration in Alberta. The process was complex and took a considerable time but on July 17, 1998 a register of midwives was opened and 24 midwives were registered in the province, including midwives with domiciliary and hospital demonstration project backgrounds (Alberta Midwifery Health Discipline Committee, 2002). A Midwifery Health Discipline Committee (MHDC) consisting of a majority of registered midwives, was established by Ministerial Order as the governing body of the discipline of midwifery and to advise the government on matters relating to the regulation of midwives, thus establishing midwifery as a self-governing profession (Alberta Midwifery Health Discipline Committee, 1993).

The model of midwifery to be practised by registered midwives in Alberta is described in the Midwifery Standards of Practice (Government of Alberta, 1995) developed by the MHDC and is based in a philosophy representing the beliefs of Alberta midwives and endorsed by their consumer support groups. The philosophy is presented in Figure 2.3. It was devised to encompass what the developers considered to be all the best features of the home and hospital models while eliminating those inconsistent with midwifery philosophy thus being, in their view, a truly midwifery model of practice.

Alberta Philosophy of Midwifery Care
"The practice of midwifery is based on the understanding that pregnancy, labour and birth are profound experiences which carry significant meaning for a woman, her family and her community. Midwifery is grounded in the principles of health and wellbeing, recognizing that conception, pregnancy, birth and breastfeeding are natural life processes. Midwifery care enhances these life experiences and provides continuity of care through a reciprocal relationship between midwives and women and their families. Midwifery is traditionally wholistic, combining an understanding of the social, emotional, spiritual, psychological and physical aspects of a woman's reproductive experience. Midwives promote wellness in women, babies and families both autonomously and in collaboration with other health care professionals. Midwifery is a partnership between a midwife and a woman and her family which is based on mutual respect. With midwifery care, the woman is the centre of the childbirth experience and a great influence on the wellbeing of herself and her family. The practice of midwifery is based on the individual, recognizing each woman's unique strengths and needs. Midwifery care promotes self-care, growth, awareness and confidence, and is provided in a manner that is flexible, creative, empowering and supportive. Midwifery actively encourages informed choice throughout the childbearing cycle by providing relevant, objective information to facilitate decision-making. The practice of midwifery enables women to develop the understanding, skills and motivation necessary to take responsibility for and control of their own health".

Figure 2.3 (Government of Alberta, 1995 p.15)

The Alberta midwifery model of practice, which is prescribed in the standards of practice, incorporates the principles of informed consumer choice, continuity of care, choice of primary health care provider, collaborative care, choice of birth setting, accountability and evaluation of practice and research on effectiveness of midwifery care (Government of Alberta, 1995). Each principle is prescribed in some detail and together they form the foundation for the model of practice for Alberta midwives. The principles are presented in Figure 2.4.

Alberta Principles of Midwifery Care
"**Informed Consumer Choice** Responsiveness to consumer needs is a guiding principle of midwifery practice. Midwives respect the right of the clients to make informed choices and actively encourage informed client decision making. Midwives facilitate decision-making by sharing relevant information with their clients. Informed choice is a decision-making process which relies on a full exchange of information in a non-urgent, non-authoritarian,

cooperative manner.
Midwives support the principle of informed choice by:

- Promoting shared responsibility between the woman, her family and her caregivers and recognizing and supporting the pregnant woman as the primary decision maker.
- Encouraging clients to actively participate in their care and to make choices about the services they will receive and the manner in which care is provided.
- Discussing the scope and limitations of midwifery care with their clients.

Continuity of Care

Midwives provide comprehensive prenatal, labour, birth and postpartum care to her clients, as well as counselling education and emotional support related to the clients' physical, psychological and social needs.
Continuity of care is fundamental to the midwifery model of practice. It is both a philosophy and a process that enables the midwife to provide wholistic care and to establish an ongoing intimate partnership with the client in order to build understanding, support and trust.
Although continuity of care is usually facilitated through a one-to-one relationship between a midwife and a client, midwifery care can be provided by a small group of midwives if the client has the opportunity to establish relationships with all the members of the group. Midwives involved in group practice must share a common philosophy in order to support continuity of care.

Choice of Primary Health Care Provider

Midwives respect the right of consumers to choose the service provider and type of service that best meets their needs. Midwives are primary health care providers whom clients may choose as their first point of entry to the maternity care system.
As primary health care providers, midwives make autonomous decisions in collaboration with their clients and are fully responsible for the provision of primary health services within their scope of practice. They coordinate services to ensure continuity of care, identify conditions requiring management outside their scope of practice and refer such cases to other providers.

Collaborative Care

Midwives collaborate with other professionals to ensure their clients receive the best possible care.
Collaborative care involves the cooperation and assistance of various professionals in the provision of care. Midwives balance continuity of care with the specific needs of each client to ensure appropriate levels of service. Collaboration with other health care providers occurs with the client's permission and in the best interests of the client.
Midwives also recognize and support continuity of care throughout the entire life cycle. The midwife, with the consent of the client, shares records and information with, and provides a summary of care to the client's family physician and other health care professionals.

Choice of Birth Setting

Midwives respect the right of consumers to make choices about the setting for birth.
Midwives can provide care in a variety of settings, including hospitals, birth centres and homes. The ability to follow the client is an essential aspect of continuity of care and informed consumer choice. The birth setting is chosen by the client in consultation with the midwife.

Midwives provide clients with the information required to make an informed choice about appropriate settings in which to give birth. To provide midwifery care midwives need access to a variety of settings. Certain settings require direct admitting privileges for this to occur.
Accountability and Evaluation of Practice Midwives are accountable to their clients, peers and the wider community for safe, competent, ethical practice. Midwives continuously evaluate their practices to improve the quality of care they provide and to ensure their clients' needs are met. Midwives' fundamental accountability is to their clients. They are also accountable to the regulatory body, the health agencies they practice within, and, as members of the profession, to the public. Evaluation includes ongoing community input into midwifery practice in all settings and participation in current mortality reporting standards and review processes. Results of these evaluations are widely distributed to influence policy, education and midwifery practice.
Research on Effectiveness of Midwifery Care Midwives develop and share midwifery knowledge and initiate, promote and participate in research regarding midwifery outcomes. The regulation of midwifery and the development of guidelines for midwifery care provides an opportunity to examine the safety of various birth settings and the effectiveness of midwifery practice. Research on the effectiveness of midwifery care and the outcomes of midwife attended births in home and hospital settings will be undertaken. All midwives will be expected to participate in this endeavour and to use the findings to develop and enhance their practice."

Figure 2.4 (Government of Alberta, 1995 pp. 16-19)

2.1.8 The British Columbia Model

The third province to enact legislation for the regulation of Midwifery was Alberta's westerly neighbour, British Columbia. The process of implementing and integrating the profession was similar to and concurrent with the process in Alberta and the model of practice adopted was close to identical (Rice, 1994, Kornelsen and Carty, 2004, Westfall, 2002). There were only two substantive differences between professional midwifery in the two provinces. Firstly, in British Columbia the government publicly funded midwifery services while in Alberta women had to pay out-of-pocket even though maternity care from a physician was covered under the Alberta Health Insurance Plan. Secondly, in 1992 a four year baccalaureate midwifery education programme was established at the University of British Columbia while midwifery education continues to be unavailable in Alberta. These two differences still exist in 2009 although plans for both are underway. The British Columbia model is discussed further in Chapter 7.

2.2 The Current Status of the Canadian Model

As the regulated model of midwifery continues to grow and spread across Canada, its evolution approaches the end of a full circle from the community-based, woman-centred First Nation model through an institution- based, provider-centred hospital model and back to a community based, woman-centred regulated model. Currently in 2009 midwives are recognized by legislation in eight of ten provinces and one of three territories with one other province moving towards recognizing midwives (Canadian Association of Midwives, 2009).

The Canadian model is used as a basic model against which to classify other models of midwifery in the remainder of Part 1 of this thesis. In Chapter 3 a review of the literature is used describe elements that make up the model. In addition, a system of classification, developed to further examine how individual and combined elements of a model may potentially affect outcomes, is introduced.

Chapter 3: The Elements of the Canadian Model of Midwifery

In North America, the perception that midwifery was unsafe fostered by the unregulated practice of midwifery (Walker, 1991, Walker, 1998) led to research where outcomes of care provided by recognized, autonomous midwives were compared with those of physicians. This research provides evidence from both Canada (Buhler et al., 1988, Harvey, 1996, Janssen et al., 2007b, Kaufman and McDonald, 1988, Fraser et al., 2000a) and the United States (Cragin, 2002, Cragin and Kennedy, 2006, Brown and Grimes, 1993, Butler et al., 1993, Davis et al., 1994, Mayes et al., 1987), that midwifery care generally results in reductions in indicators of morbidity and fewer interventions when compared to medical care. The potential that maternity care models influence clinical outcomes and more specifically whether different models of midwifery might result in different outcomes was of great interest to me. In this chapter the elements of the Alberta midwifery model are described and modified to make them consistent with the nomenclature currently in use in the international literature for the purpose of identifying potential relationships between midwifery models and outcomes of childbirth. In Chapter 4 the selected outcomes studied are identified and described and the elements of the Alberta model are used as a starting point to explore further the literature related to the effects of models of midwifery on birth outcomes.

Medline, CINAHL, and Evidence Based Medicine Reviews were searched initially for development of the IMSEP research proposal. The need for a broader and more in-depth review of the literature was generated from the process of conducting the initial IMSEP research and a further review was conducted to gain a deeper understanding of models of midwifery and their potential to affect birth outcomes. In the second review the Cochrane Library, Proquest Digital Dissertations, Sociological Abstracts, PsychINFO and MIDIRS Digest were added to the databases searched. Key terms were chosen based on the search engine used and were linked with subject headings, exploded when possible and included: midwifery, midwifery

models, partnership, continuity of care, autonomy, community, choice, Caesarean section, episiotomy, epidural, induction of labour, maternal satisfaction and control. Reference lists from articles obtained from the search were also reviewed and some publications were obtained from these lists. Relevant unpublished reports and conference proceedings were obtained when possible.

3.1 Definition of a Model

My review of the literature revealed that the meaning of the term model was often not well defined, different for different writers and changed over time. The earliest recorded practice model was a model of nursing described by Florence Nightingale in 1859 (Nightingale, 1980) as a way of defining nursing knowledge as distinct from medical knowledge and nurses as independent from physicians (Reed and Zurakowski, 1983). Later, nursing scholars continued to publish models of nursing that led to a distinct body of knowledge within the discipline of nursing in the1960s (Ellis, 1983). With the development of nursing science more explicit identification of theoretical components in nursing models began to emerge. The increasingly theoretical approach to the development of models resulted in a series of models which arose from conceptual frameworks and were referred to collectively as nursing theories (Fitzpatrick and Whall, 1983). Nursing theories were intended to guide practice but acceptance of them by practioners has been slow.

There is no documented verification that any work was carried out on developing a theory of midwifery at the time these nursing theories were being developed. Midwifery scholars have adapted nursing theories based in self care (Orem, 1971), activities of living (Roper et al., 1985) and human needs (Henderson, 1966) to characterize midwifery practice during the 1970s and 80s but there is no evidence of any of them having been widely accepted (Midgley, 1995) although one model developed by American nurse-midwife Ernestine Wiedenbach (Wiedenbach, 1964), was used as the basis for the American College of Nurse-Midwives philosophy (Cragin, 2004).

From a less scholarly and more pragmatic perspective the use of the term "model" as it relates to midwifery evolved from the need to find a noun to describe what one midwife or group of midwives does so that it can be differentiated from what other midwives or health care providers do when they provide maternity care. A model of midwifery practice or midwifery model is defined as the identification of the elements which are fundamental to the practice of midwifery by a midwife or group of midwives. For a model to be useful in seeking a relationship between elements of midwifery practice and clinical outcomes its major elements should be clearly stated in concrete terms which can be reduced into observable indices (Riehl and Roy, 1980).

A major challenge in developing a model of midwifery for Canada had been to develop one that would conform to the requirements of legalized midwifery while remaining true to the values and beliefs which constitute what midwives felt to be the true spirit of midwifery (Rice, 1994) without succumbing to the influence of the pervasive medical model of maternity care as the nurse-midwives pilot projects were considered by some to have done. This 'spirit of midwifery' was considered to be of paramount importance and a hallmark of the existing Canadian New Midwifery Model, described in Chapter 2, as it meant being 'with woman' as a midwife. The use of terms like 'true', 'traditional' or 'real' midwifery in reference to the concept of a 'spirit of midwifery' reflects a deep-rooted Canadian philosophy that being a midwife means more than providing midwifery services. This philosophy recognizes the essence of being a midwife as being an integral part of women's experiences of bearing children and sharing those experiences with them. Midwives considered this philosophy of midwifery to be the thing that most differentiates them from other maternity care providers who attend but do not share the experience of birth. Canadian midwives are not alone in finding the 'spirit of midwifery' elusive and difficult to define although midwives who have experienced it report that they know, intuitively, that it means working in a way that is congruent with their ideals (Hunter, 2006) even though there is no recognized word that is consistently used to describe the experience. When able to work in this way midwives feel they are practising 'real midwifery' (McCourt and Stevens, 2005)" or being a

'proper midwife'" (Hunter, 2006). Having experienced this kind of midwifery but perceiving it to be threatened by changing policies, the loss was felt strongly enough to motivate British midwives to call for a Campaign for Real Midwifery (Ewing, 2006).

The Alberta regulated midwifery model of practice, consists of the elements of informed consumer choice, continuity of care, choice of primary health care provider, collaborative care, choice of birth setting, accountability and evaluation of practice, and research on effectiveness of midwifery care (Government of Alberta, 1995). Although studies of the similarities and differences between the various provincial models of midwifery in Canada were not found, it was not expected that there would be significant differences between the Alberta model and other Canadian models as they had all been developed as a single model (Bourgeault et al., 2004) based on the work of the Ontario Midwifery Implementation Task Force (Eberts et al., 1987). Inter-provincial differences may exist (Bourgeault and Benoit, 2004) as a result of geographic or cultural needs but all regulated Canadian models have been recognized by the Canadian national midwifery regulation body as similar enough for reciprocity between the provinces for registration of midwives (Canadian Consortium of Midwifery Regulators, 2001). For the purposes of this thesis, it is assumed there are no major differences between regulated models of midwifery in Canada.

Canada has not been alone in undergoing a resurrection of midwifery over the last several decades. Midwifery is a recognized part of the health care system in most countries with an estimated 75% of the world's children being born into the hands of midwives (Hawkins and Knox, 2003). However, midwives have lost their "once powerful role in the lying in chamber" (Page, 1988 p. 252) where they were the sole practitioner and cared for the woman and her family throughout the childbirth experience. Today, many midwives play a role as one of many professionals in a system where care is fragmented, hospital based and dictated by the needs of medicine and the routine use of technology (Flint, 1988). Much has been written about contemporary efforts to revive a more traditional model of 'true' midwifery around the world resulting from a desire for more judicious use of

technology, a more human approach to birth and a revival of birthing at home, most notably in Europe, Australia, New Zealand and the United States of America (Sandall et al., 2001a, Donley, 1995, Gaskin, 1989, Hobbs, 1997, Isherwood, 1995, Lecky-Thompson, 1995, Smulders and Limburg, 1988, Sullivan and Weitz, 1988, Cohen, 2006, Flint, 1988).

That a need exists for a theoretically based midwifery model has been recognized. (Walsh, 2006). To this end midwife scholars are beginning to conceptualize theoretical models of practice (Guilliland and Pairman, 1995, Kennedy, 2000, Kennedy, 2001, Kennedy et al., 2003, Pairman, 1995, Pairman and McAra-Couper, 2006) . The goal of these seminal works is defining the unique elements of midwifery as it is practised today. Although they are, as yet, in their infancy, these models show great promise for fulfilling the need for a theoretical model of 'full tradition' (Pairman, 1995 p. 38) or 'true' (Kennedy et al., 2003) midwifery.

3.2 Elements of Midwifery

A plethora of traditional and contemporary models of midwifery care are currently being practised internationally (Beake and Bick, 2005, Murphy-Black, 1992). These are often based on the elements of midwifery they purport to encompass, such as team midwifery (Waldenstrom et al., 2000), independent midwifery (Donley, 1995), partnership midwifery (Benjamin et al., 2001), caseload midwifery (Leap, 1994) and one-to-one midwifery (McCourt and Page, 1996). In some instances the new models have been evaluated, frequently comparing emerging models with existing models with regard to various outcome and process measures.

3.3 Definitions of Model Elements

In order to facilitate the use of a classification system to review an ensemble of models the elements of the Alberta model were broadened and in most cases renamed. The purpose of this modification is to bring the elements into line with language and understanding currently being used in the international literature, to simplify the nomenclature and to provide clear definition of the elements used in this discussion. Following the review and modification of the seven Alberta elements, five were used for the

classification system and two, 'Accountability and Evaluation of Practice' and 'Research on Effectiveness of Midwifery Care', were not considered to be independent elements as they affect practice indirectly and are mentioned rarely and with minimal description in the studies reviewed.

3.3.1 Alberta Elements

The seven Alberta principles of care, that were described in detail in Chapter 2, were transformed into five elements of midwifery models as shown in Figure 3.1. The process by which this transformation was accomplished is described in the following sections.

Relationships between Alberta Principles and Model Elements	
Original Alberta Principle	**Redefined Model Element**
Informed Consumer Choice	Partnership
Continuity of Care	Continuity
Choice of Primary Health Care Provider	Autonomy
Collaborative Care (Supportive practice environment/community based)	Community
Choice of Birth Setting	Choice
Accountability and Evaluation of Practice	Autonomy
Research on Effectiveness of Midwifery Care	Autonomy

Figure 3.1

3.3.1.1 Partnership

Partnership is the first element of midwifery to be included in the classification system based on its perceived strength within the model. It is based on the element in the Alberta model of midwifery which is labelled Informed Consumer Choice (Figure 3.2) but includes a description of a much broader concept. As the fifth principle in the Alberta model also relates to choice, as Choice of Birth Setting, it has been expanded to include Informed Consumer Choice in an element labelled Choice and the first element has been renamed Partnership.

Alberta – 1. Informed Consumer Choice (Redefined as Partnership)
Responsiveness to consumer needs is a guiding principle of midwifery practice. Midwives respect the right of the clients to make informed choices and actively encourage informed client decision making. Midwives facilitate decision-making by sharing relevant information with their clients. Informed choice is a decision-making process which relies on a full exchange of information in a non-urgent, non-authoritarian, cooperative manner. Midwives support the principle of informed choice by: • Promoting shared responsibility between the woman, her family and her caregivers and recognizing and supporting the pregnant woman as the primary decision maker. • Encouraging clients to actively participate in their care and to make choices about the services they will receive and the manner in which care is provided. • Discussing the scope and limitations of midwifery care with their clients

Figure 3.2 Source (Government of Alberta, 1995 pp. 16-17)

Although the label of this element in the Alberta model refers exclusively to consumer choice, it is clear from the description of the element that it, in fact, encompasses more than just the process of making a choice; it also includes the roles of the woman and the midwife as they collaborate in the making of choices related to the woman's childbirth experience. The collaborative roles of the woman and midwife are integral to the Canadian model of care and protect the role of the midwife as being 'with woman' in a sisterhood of mutual trust and respect which has been paramount, to women and midwives alike, throughout the evolution of midwifery in Canada as described in Chapter 2. Canadian midwives consider the midwife-woman relationship to be based on trust, respect and commitment and to facilitate communication and enhance care (Harding, 2000). When a woman and midwife share a special relationship it is seen to have a beneficial healing effect on the woman (McCrea and Crute, 1991). This belief that the relationship between midwife and mother may affect the quality of the woman's childbirth experience is supported by a wealth of evidence in the literature (Hunter, 2006).

Among the first midwife scholars to describe the relationship between a woman and her midwife, Caroline Flint eloquently describes it thus:

> To be a midwife is to be with women – sharing their travail and their suffering, joys and delights. To be a midwife is to engage in a close and intimate relationship which often lasts only as long as the pregnancy, birth and puerperium, but the effect of which travels down through centuries in the image women have of themselves and their abilities and worth." (Flint, 1986 p. 14)

The importance of this special relationship between woman and midwife is increasingly being recognized internationally as a partnership that is integral to midwifery practice. It is a relationship which occurs between two partners and is individual and unique for each partnership as the woman is influenced by the beliefs and values of those she considers important in her life while the midwife is affected by the ethics and standards of her profession (Pairman, 1995). Woman and midwife are generally considered to be equals within this partnership but recent research has suggested that it is possible for a trusting relationship to be negotiated without the midwife and woman being equals (Freeman et al., 2004).

In its vision for midwifery care the Association of Radical Midwives in the United Kingdom identified the relationship between mother and midwife as fundamental to good midwifery care (Association of Radical Midwives, 1986). In the United States, a relationship in which the midwife recognizes the woman as a partner in care and forms an alliance with her has been identified in recent research as one of the overarching themes of midwifery practice (Kennedy et al., 2003). In Australia, midwives and women have identified building trusting relationships with women as a part of what midwives do (Homer et al., In Press). In New Zealand, which has been recognized as a world leader in the partnership model (Brodie, 1997) and where partnership in childbirth was born out of and remains embedded in a political partnership where women and midwives worked together and achieved the rebirth of autonomous midwifery; the sharing relationship is considered so central to practice that midwives have articulated midwifery as a partnership between the woman and her midwife (Guilliland and Pairman, 1995). The degree to which the recognition of the importance of the

relationship between a women and her midwife is universally supported as an essential element of midwifery was corroborated when the International Confederation of Midwives adopted a position statement in 1993 affirming that midwifery is a profession which is based in partnerships between women and midwives (International Confederation of Midwives, 1993).

Although partnership has become well recognized as an element of midwifery, a clear understanding of its effect on outcomes has been difficult to measure as until recently, descriptions of the relationship between midwives and women in the literature indicate "a hazy and amorphous notion that is often rather loosely applied" (Hunter, 2006 p. 311) with little explanation of what its components are or what might influence it. However, over the last decade efforts have been made to understand the complex theory of reciprocity that is the core of a partnership between woman and midwife and several interpretations of the interdependence between women and midwives have been described (Fleming, 1998b, Hunter, 2006, Stevens, 2003, Fleming, 1998c, Rooks, 1999, Sharpe, 2004). Hopefully, a more detailed understanding of the concepts that make up partnership will lead to more clarity of definitions of this element in future research as well as providing a way to measure the degree to which the element of partnership is achieved within a given midwifery model.

3.3.1.2 Continuity

Continuity is the second element of midwifery to be included in the classification system based on its perceived strength within a model. In the Canadian model of midwifery (Sharpe, 2004), as elsewhere (Pairman et al., 2006), continuity is considered to be related to the element of partnership in the provision of midwifery care. It has been suggested that a partnership can only develop fully in an environment where midwives are able to provide continuous care throughout pregnancy and birth and beyond and that when care is fragmented the time commitment necessary for the special relationship to be developed is not possible (Guilliland and Pairman, 1995) resulting in the loss of the partnership between woman and midwife (Bickley, 1989). Following in-depth study of caseload midwifery McCourt and Stevens

(2005) found the midwife-woman partnership to be a central characteristic of caseload practice and continuity to be a major 'linking' theme which is connected to all other important themes and appears to be an important underpinning and facilitative feature of caseload midwifery. They further suggest that continuity is not an end in itself but an important means towards the end of woman-centred care. That settings which facilitate continuity, such as community-based models, seem to result in more meaningful relationships supports the potentially facilitative nature of the role of continuity (Hunter, 2006).

The apparent closeness of the relationship between continuity and partnership caused me to consider combining them as one element. However, the understanding of continuity of care as fundamental to midwives forming a partnership with women has been questioned in Alberta were family physicians claim to provide continuity of care but only a few engage in a partnership and many adopt a rather a more patriarchal approach. In addition, an in-depth examination of the relationship between Alberta women and midwives found that the relationship was not developed between all midwife and women pairs despite the same structure and continuity of practice (James, 1997). Freeman (2006), following a review of the literature, also concluded that continuity of care throughout the childbirth experience did not necessarily lead to midwives developing meaningful relationships with women although the evidence on which the conclusion is based is not unequivocal (Freeman, 2006). Generally, in the literature, partnership and continuity are closely linked and there is a lack of clarity in definition leading to confusion in interpreting results and difficulty in separating partnership and continuity as individual elements (Homer et al., In Press).

In light of the obvious complexity of the relationship between partnership and continuity I decided to include Partnership and Continuity as separate elements of midwifery and continue the clarification of their individual characteristics to facilitate further study of their relationship. Continuity, therefore, is based on the element in the Alberta model of midwifery which is labelled Continuity of Care (Figure 3.3).

Alberta – 2. Continuity of Care (Redefined as Continuity)
Midwives provide comprehensive prenatal, labour, birth and postpartum care to her clients, as well as counselling education and emotional support related to the clients' physical, psychological and social needs. Continuity of care is fundamental to the midwifery model of practice. It is both a philosophy and a process that enables the midwife to provide wholistic care and to establish an ongoing intimate partnership with the client in order to build understanding, support and trust. Although continuity of care is usually facilitated through a one-to-one relationship between a midwife and a client, midwifery care can be provided by a small group of midwives if the client has the opportunity to establish relationships with all the members of the group. Midwives involved in group practice must share a common philosophy in order to support continuity of care.

Figure 3.3 (Government of Alberta, 1995 p. 17)

In Alberta, as elsewhere, recognition that continuity of midwifery care during pregnancy, childbirth and postnatal period is associated with lower rates of obstetric interventions (Hodnett, 2001) and necessary for the optimal health and wellbeing of mothers and babies arose in the same climate of fragmented, medicalized care as the recognition of the need for partnership relationships with women (McCourt et al., 2006b). Continuity has not been identified as often as partnership as an element of midwifery practice but it has been more frequently studied. This may be because, as a relationship, partnership has been seen as difficult to measure while continuity as a reflection of how care is organized may be to be more easily definable and measurable. In fact, continuity and partnership are often used synonymously or measured as proxies for each other.

In Canada, prior to legislation, midwives defined continuity of care as one on one care provided to a woman by a single midwife in a relationship resembling friendship (Kreiner, 2005). This type of continuity evolved from the days of the traditional model of midwifery by midwives who believed in what they saw as a true midwifery approach and, due to the covert nature of their practice, cared for very few women. In Alberta, although some midwives continued to practise solo, that is, one midwife practising alone (Page, 2003), most had come together in cooperatives to provide back-up for each other by the time midwifery standards were written. Recognition that solo practice might be unsustainable for some midwives after legislation, when they

carried a caseload of forty women or more a year and the need to accommodate a few midwives who were already beginning to practise in teams, the definition of continuity was broadened to allow for care by a small group of midwives. Nevertheless, the strong belief that continuity was the basis of an effective relationship between a woman and midwife led to restricting the number of midwives who could provide care to a woman to the number with whom she could successfully establish relationships. In Alberta, as elsewhere, where the acceptable maximum number of midwives per team has been studied (Hindley, 2005) this is generally accepted to be four midwives per team. This understanding of continuity as a philosophical base rather than a process led to a requirement for all midwives in a team to have the same philosophy of continuity (Kreiner, 2005).

The expanded definition of continuity is consistent with other interpretations (Green et al., 1998, Sandall et al., 2001b) and the terms 'continuity of care' and 'continuity of carer' have been used to differentiate between the two types of continuity (Garcia, 1995, McCourt et al., 2006b, Walton and Hamilton, 1995, Green et al., 2000) although this may have added to the confusion as they are sometimes used synonymously (Haggerty et al., 2003). As the nature of continuity is further explored the terms 'continuity of experience' and 'continuity of relationship' are also beginning to appear (McCourt and Stevens, 2005). In 2009 in Alberta, only three midwives continue to practice solo and all care for a very small number of women and rely heavily on practicum midwifery students and other health care professionals for support. Most midwives work in partnerships made up of small groups of three or less. In some midwife partnerships women have a named midwife and in others they form relationships with all the midwives in a group.

Although the recognition of the need for continuity in midwifery practice has been global, work on developing and implementing continuity of care in practice has been spearheaded in the United Kingdom, where a series of government documents at the turn of the millennium upheld women's right to continuity of support through their childbirth experience (Department of

Health, 1993, Department of Health, 2004). While nursing and medicine can provide components of normal maternity care, only midwives, can facilitate the total birth experience (Guilliland and Pairman, 1995) and, as the main providers of maternity care in the UK, midwives were uniquely placed to provide the continuity of support recommended by government (Walton and Hamilton, 1995). In fact, a move towards more continuity of midwifery services in response to public demand had already begun. Over the past two decades a number of new models of midwifery where continuity is a substantial change from the existing model have been introduced into the UK and evaluated (McCourt et al., 2006b).

Continuity, while being considered an element of the new models, has been variously defined by the patterns and concentrations of the interactions between the women and midwives (McCourt et al., 2006b). Continuity has ranged from an element where each woman has a named midwife as in caseload midwifery (Andrews et al., 2006); identified by some midwives as ideal (Flint, 1993); to team midwifery where as many as 24 midwives may constitute a team (Beake and Bick, 2005). Solo midwifery practice, when it is discussed, is usually only included to illustrate what the midwifery model being described is not (Page, 2003). Although these models have been set up with the aim of improving continuity of care they have not always worked as they were intended (Green et al., 1998) and have not universally succeeded in improving continuity (Todd et al., 1998, Seccombe and Stock, 1995, Andrews et al., 2006). It has even been suggested that the team approach may be damaging to continuity, deleterious to midwives relationships with women (Todd et al., 1998) and increase stress and burnout of midwives (Sandall, 1997b). Because of lack of agreement on the definition of continuity or a clear conceptual framework that explains what it accomplishes and how, reliability and generalizability of the effect of continuity, when comparing models, have been diminished (Donaldson, 2001).

Recognition of the need for a common understanding of the concept of continuity across disciplines if a valid and reliable measurement is to be achieved (Haggerty et al., 2003) has resulted in several recent substantial

literature reviews being undertaken which attempted to define continuity (Donaldson, 2001, Haggerty et al., 2003, Saultz, 2003, Jee and Cabana, 2006, Joyce et al., 2004, Sparbel and Anderson, 2000). Midwifery scholars have suggested that, based on these reviews, continuity of midwifery care might most usefully be described as a hierarchical concept with informational continuity at the base level evolving through longitudinal continuity to interpersonal continuity at the summit (McCourt et al., 2006b, Finlay et al., 2007) after a model proposed by Saultz (2003). These three types of continuity have also been labelled informational, management and relational (Freeman, 2007, Haggerty et al., 2003, Sandall, 2007). Hopefully, testing and refinement of these concepts will lead to a better understanding of the element of continuity, definitions of its components and the much needed, universally accepted measure of its strength leading to enhancement of the quality of the essential critical evaluation of new midwifery models (Garcia, 1995).

3.3.1.3 Autonomy

Autonomy, the third element of midwifery to be included in the classification system, is based on the element in the Alberta model of midwifery which is labelled Choice of Primary Health Care Provider and is the only element in the Alberta model which refers to autonomy directly (Figure 3.4). Choice, on the other hand, is referred to in a variety of forms in several of the Alberta principles and is defined as an element in 3.3.1.5 below.

Alberta – 3. Choice of Primary Health Care Provider (Redefined as Autonomy)
Midwives respect the right of consumers to choose the service provider and type of service that best meets their needs. Midwives are primary health care providers whom clients may choose as their first point of entry to the maternity care system. As primary health care providers, midwives make autonomous decisions in collaboration with their clients and are fully responsible for the provision of primary health services within their scope of practice. They coordinate services to ensure continuity of care, identify conditions requiring management outside their scope of practice and refer such cases to other providers.

Figure 3.4 Source (Government of Alberta, 1995 p. 17)

That midwives are autonomous health care providers is a central concept of the international definition of a midwife (International Confederation of Midwives, 1996). Midwives, although not always understanding the implications of autonomy and having mixed views on whether they do, in fact, practise autonomously or not (Pollard, 2003), have identified lack of autonomy as a serious threat to their satisfaction (Hundley et al., 1995) and ability to practice to the best of their ability (Tritten, 2003). Autonomy is defined in the Oxford Concise Dictionary as "the right to self-government/personal freedom/freedom of will" (Allen, 1990). Legitimate autonomy enables professions to exercise control over the tasks defined by the profession to be within their authority (Witz, 1992). For midwives' autonomy to be legitimate, self-governance is essential for if the control imposed by regulation is not determined by the people over whom the control is exerted questions remain about the legitimacy of that governance (Yates, 2006).

The absence of greater reference to autonomy in the Alberta model is surprizing because to be a self-regulating profession was a primary goal of the Alberta Association of Midwives when it applied for legal recognition. Like midwives in other parts of the world where midwifery has become redefined in the recent past, Canadian midwives believed professional autonomy is the ability to practice independently from other disciplines, to define their own scope of practice, to regulate their standards and to hold their members accountable for the quality of their practice (Guilliland and Pairman, 1995) and second in importance, as an element of midwifery, only to the midwives' relationships with women (Watson et al., 1999). The maintenance of self-imposed quality and ethical standards by midwives is necessary to protect the public (Massey, 1999) and is a legal requirement for designation of a college for any health discipline in Alberta. The identified relationship between the quality of maternity care in a country and the level of autonomy of midwives (Wagner, 2005) also contributed to Canadian midwives' commitment to being self-regulated. The goal of self-regulation was achieved in Alberta, despite opposition from nursing and medicine, when midwifery was designated as a health discipline under the Health Disciplines Act. As a

self-regulated profession, midwives understood autonomy to be a given and deemed further reference to it in descriptions of the midwifery model unnecessary. This is particularly interesting in light of the fact that history has shown this not to be the case in the United Kingdom where midwives are officially autonomous but autonomy is, in reality, far from being a given (McCourt, 2008).

Although self-regulation is clearly the hallmark of professional autonomy, it is difficult to define autonomy absolutely in the complex context in which midwives practice worldwide (Pollard, 2003) but many other ways in which midwives' autonomy may be enhanced or limited have been identified. To be fully autonomous, midwives need to be primary health care providers in the sense that women have the ability to receive maternity care directly from midwives without the need of an assessment or referral by another professional. Mothers and babies need legally guaranteed direct access to midwives (Jowett, 2000) and when it is provided practitioners perceive an increased sense of prestige and status (Hansson et al., 2008).

Access to medical facilities is also necessary for health care providers to practise independently (Kelly, 1985) and full hospital admission privileges for midwives to be fully autonomous (Vann, 1998). For a midwife, having full admitting privileges means being able to admit, diagnose, treat, prescribe for and discharge women and babies totally on her own responsibility. When a woman gives birth under the care of a fully privileged midwife, the midwife is identified on the woman's chart as the admitting practitioner and no physician's name appears anywhere on the mother's or baby's records unless the midwife consults or refers her client to a physician. Being primary health care providers and having hospital admitting privileges enables midwives to autonomously link acute and community care (Page, 2004). Full admitting privileges for midwives are rare in the world as in most countries only physicians have the right to admit patients to hospital, including women admitted for childbirth. Hospitals that refuse to grant clinical privileges to midwives claim to do so due to concerns that the hospital and members of its medical staff may be subject to vicarious liability for midwives malpractice, despite the fact that they are clearly not so liable (Jenkins, 1994). Even when

self-regulated midwives are granted admitting privileges, as happens in some US states, they must meet criteria and standards of medical care established and enforced by the medical staff and resulting in midwives' practice being supervised by physicians and their autonomy seriously undermined (Vann, 1998). This power of the medical profession is widely felt as a barrier to autonomous midwifery (Pollard, 2003) which some midwives have ameliorated by crafting excellent working conditions with individual doctors (Grant, 2002, Pollard, 2003). When midwives are employees of a hospital or health authority they may feel a sense of autonomy if they are able to admit a woman to the labour ward without medical consultation but, in fact, the final responsibility usually rests with a named physician and the midwife is even more vulnerable to the power of the medical profession.

In Alberta, midwives have had hospital admitting privileges since soon after the regulation of midwifery, facilitated by a change to a Hospitals Act that previously prevented hospitals from granting privileges to non-physicians. Even so, there is considerable difference between regions within the province of what is meant by being a privileged midwife. In one region, midwives may apply for and be granted privileges to any hospitals of their choice providing maternity services. A Division of Midwifery has been established within the Department of Family Medicine and midwives have the same rights and responsibilities as physicians in the department. Although midwives are subject to hospital policy; standards of midwifery practice, quality assurance, peer review and granting of privileges to midwives are the responsibility of the midwife who is appointed Chief of the Division of Midwifery. In another region, midwives may only be granted privileges in one of two selected hospitals where midwifery affairs are administered through a Regional Women's Health Program committee which is led by a nurse and an obstetrician and has one midwife representative. A Medical Advisory Committee, with no representation from midwifery, approves midwives' privileges. Midwifery standards of practice, quality assurance and peer review are all directed by medically led groups with little midwifery input (Greenhalgh, 2008).

Another factor which may affect midwifery autonomy is the availability of liability insurance which, in an increasingly risk-adverse society, is becoming more difficult for midwives to obtain (Lewis, 2007). In the United Kingdom midwifery has become gradually less autonomous despite vigorous campaigning by midwives (Jowett, 2000), as a result of revised legislation over the years since a Midwives Act recognized midwifery as a self-regulating profession in 1902. This lack of autonomy resulted in independent midwives being identified as the only truly autonomous midwives still practising in the United Kingdom (Pollard, 2003). The recent introduction of a requirement for self-employed midwives to carry liability insurance endangers the existence of the few independent midwives who are still practising in the United Kingdom (Lewis, 2007, Anonymous Editor, 2007). As elsewhere in the world liability insurance in Alberta would have been difficult for midwives to obtain and prohibitively expensive but government subsidy has enabled coverage for all registered midwives.

The manner in which midwives' practice is funded can also have a profound effect on professional autonomy. When midwives are employed and remunerated by health authorities they may be constrained by their employee status to the protocols of the medical community to provide care in a manner that is hospital-centred as opposed to woman-centred, diminishing the quality of midwifery care. Midwives who are self-employed and self-managed have more control over working arrangements and flexibility and independence in maintaining the level of autonomy necessary to confidently manage care around the needs of the women for whom they care (Sandall et al., 2001b, McCourt and Stevens, 2005, Monk, 2006). On a more day-to-day level, organizational constraints can leave midwives with very limited opportunities to be autonomous professionals (Davies and Ireland, 2006) and result in them feeling oppressed and powerless (Kirkham et al., 2002). Working in an inflexible, fragmented system where managers are not supportive or have unrealistic expectation of midwives reduces midwives feeling of control of their practice (Page, 2004, Davies and Ireland, 2006). Advocating for a woman's right to choose in close proximity to a disapproving supervisor who is her boss takes a very stalwart midwife (Neiger, 2004). For

some midwives the resulting lack of autonomy has caused them to practise outside the system or leave the profession altogether (Davies and Ireland, 2006).

In Australia, maternity care is fragmented and most midwives are employed in hospitals, although midwifery is an established profession. When compared with their counterparts in other higher income countries, midwives in Australia continue to practise with considerably more limitations placed on their autonomy (Brodie, 2002). As a result, the reduction and erosion of the role of the midwife to that of an obstetrics nurse is well documented (Watson et al., 2002). When midwifery practice was extended as little as to include requesting limited diagnostic procedures and initiating limited pharmacological substances in their own right, instead of at the direction of physicians, the extended role was shown to enhance the midwives' autonomy and professionalism in the workplace (Watson et al., 2002). Overall, the degree to which midwives feel they are able to work autonomously and with authority and responsibility for their actions affects their relationships with the women for whom they care and therefore the quality of the care women receive (McCrea and Crute, 1991).

In Alberta, the government has not provided public funding for midwifery. Consequently, women must contract with midwives for services and pay for them out-of-pocket within an otherwise publicly funded system. While midwives deplore this situation and, with women, have campaigned vigorously against it, it has resulted in midwives having great autonomy in how they organize, manage and implement their practices. Midwives continue to lobby government for funding but they are aware that this could severely limit their professional autonomy and ability to make a reasonable living.

3.3.1.4 Community

Community is the fourth element of midwifery to be included in the classification system based on its perceived strength within a model. It is based on the principle in the Alberta model of midwifery which is labelled Collaborative Care (Supportive practice environment/community based)

(Figure 3.5). Alberta midwives generally consider collaborative practice as a part of supportive community-based practice. Nevertheless, this whole principle is devoted to collaborative care although community care is included in its label and is the only reference to community based practice in the Alberta model, presumably because it was assumed that midwifery would be community-based. Community is the word commonly used to describe community-based care which includes community based practice and supportive collaboration with the community of other health professionals.

Alberta – 4. Collaborative Care (Supportive practice environment/community based) (Redefined as Community)
Midwives collaborate with other professionals to ensure their clients receive the best possible care. Collaborative care involves the cooperation and assistance of various professionals in the provision of care. Midwives balance continuity of care with the specific needs of each client to ensure appropriate levels of service. Collaboration with other health care providers occurs with the client's permission and in the best interests of the client. Midwives also recognize and support continuity of care throughout the entire life cycle. The midwife, with the consent of the client, shares records and information with, and provides a summary of care to the client's family physician and other health care professionals.

Figure 3.5 (Government of Alberta, 1995 p. 18)

There is a strong consensus internationally that midwifery practice should be sensitive to the needs of the local population and based primarily in the community (Association of Radical Midwives, 1986, Department of Health, 1993). Despite the strong recognition of the need for midwives to be based in the community very little has been written to describe what is meant by community-based practice. From what is written, it appears that when midwifery practice is community-based midwives are physically based in a community setting as opposed to in a hospital (Baston and Green, 2002). Being based in the community facilitates relationships with women by focusing care on relationships rather than on tasks (Hunter, 2006), getting to know women's families and communities and understanding cultural and language issues of marginalized, minority groups (Harper Bulman and McCourt, 2002, McCourt et al., 2006a). Usually, antenatal care is provided in a clinic which may be attached to a family practice physician's office or

based in a community health centre, shopping centre, free standing birth centre or a midwife's home office. Although home birth is more likely to be associated with community-based care it does not necessarily follow that it is and care may be as fragmented as hospital-based midwifery. Depending on the organization of the practice, however, the philosophical intention usually tends to favour home birth and continuity through home or midwife clinic visits (Baston and Green, 2002).

Collaboration is imperative in community-based practice because midwives use community services for obtaining medical consultation, collaboration and referral to ensure the safety of the women receiving midwifery care (ACNM Board of Directors, 1993). That there is a link between collaborative care and community based-care appears to be supported by community-based midwives' identification of relationships with colleagues as one of the substantive categories of community- based midwifery care (Baston and Green, 2002, Stevens, 2003). In its vision statement, the Canadian Association of Midwives states "We believe in a primary care model of midwifery that is ... collaborative" (Board of the Canadian Association of Midwives, 2002). The Alberta Association of Midwives reflects this belief in a brochure it has produced to provide information for consumers about the role of midwives (Alberta Association of Midwives, 2006). Alberta's women, like women around the world, wanted midwives who were able to collaborate with other health care professionals in an integrated way when other care was required (Homer et al., In Press). The emphasis on the collaborative nature of midwifery in the Alberta midwifery model is an appeasement of the medical profession's strong desire to control midwives and a perception expressed by medical and nursing staffs that midwives were unwilling to be a part of the larger health care team (O'Brien et al., 2004). Physicians felt that collaboration in the form of clear communication and mutual respect would be necessary for midwives to be accepted into the Alberta Health Care System (O'Brien et al., 2004) but did not believe midwives were willing to collaborate in this way. A similar uneasy nature of relationships between physicians and community–based midwives has also been noted outside Canada (Walker, 1999) and is reflected in the section headings of a chapter

entitled "Smoothing the Way" (Hobbs, 1997 p.65) in an English guidebook for independent midwives that considers midwife-to-midwife contacts under "Working with midwife colleagues" (Hobbs, 1997 p. 66) and midwife-to-physician contacts under "Seeking medical assistance" (Hobbs, 1997 p. 67).

Currently, in Alberta, with the exception of one small shared-care project which is not included in this discussion, all midwives have clinics in the community, either in a health centre, shopping centre, birth centre or in a home office. The collaborativeness of the relationships between midwives and other health professionals varies depending on the individuals involved although every effort has been made to facilitate good working relationships.

3.3.1.5 Choice

Choice is the fifth element of midwifery to be included in the classification system. It is based on the element in the Alberta model of midwifery which is labelled Choice of Birth Setting (Figure 3.6) for the reasons given in 3.3.1.1.

Alberta – 5. Choice of Birth Setting (Redefined as Choice)
Midwives respect the right of consumers to make choices about the setting for birth. Midwives can provide care in a variety of settings, including hospitals, birth centres and homes. The ability to follow the client is an essential aspect of continuity of care and informed consumer choice. The birth setting is chosen by the client in consultation with the midwife. Midwives provide clients with the information required to make an informed choice about appropriate settings in which to give birth. To provide midwifery care midwives need access to a variety of settings. Certain settings require direct admitting privileges for this to occur.

Figure 3.6 (Government of Alberta, 1995)

The first and third elements in the Alberta model now labelled 'Partnership' and 'Autonomy', as shown in Figure 3.2 and Figure 3.4 above, make it clear that Alberta midwives respect the right of women to make informed choices and actively encourage informed client decision making, including the choice of service provider and type of service that best meets their needs. What is interesting is that this fifth element singles out the choice of where to give birth as an independent element to the point of labelling of the element as 'Choice of Birth Setting'. As with other elements, it is the history of midwifery

in Alberta that results in this emphasis on the right of the woman to give birth in the setting of her choice. Having previously been denied the opportunity to provide care in their own right to women who elected to give birth in hospitals, midwives and their supporters were adamant that regulated midwives should be able to provide care autonomously in hospital settings. Likewise, feeling passionately about women's right to birth at home or in a birth centre if they so desired, women and midwives were determined out-of-hospital birth should be an option of regulated midwifery. A successful campaign, against strong opposition from health professionals (Ramondt, 1990) who could not or would not overcome their belief that home birth was unsafe or that midwives were not skilled enough to manage deliveries without supervision, was successful but resulted in incontestable, if somewhat overstated, definition of these requirements in midwifery standards. Alberta is not alone in recognizing the right of women to choose their birth setting. United Kingdom policy statements (Department of Health, 2004, Department of Health, 2007) have recently guaranteed all British women will have a choice of where they can have a professionally attended birth by 2009. However, although an important choice, as choice of birth place is only one of many choices a woman makes related to her birth experience it is not recognized as a separate element but included with all other aspects of informed choice in the element Choice.

The recognition of women's right to make informed choices and the health professional's responsibility to provide the information necessary to make those choices is prevalent in modern maternity care specifications (Department of Health, 1993, Department of Health, 2007) even if not always realistically available in practice. Many of the documents that have been published by governments detailing what maternity care should look like in the 21st century have reflected the British government's framework for care which stated "All women should be involved in planning their own care with information, advice and support from professionals, including choosing the place they would like to give birth" (Department of Health, 2004 p. 5). Like all Canadian midwives (Board of the Canadian Association of Midwives, 2002) and midwives around the world (Association of Radical Midwives, 1986),

Alberta midwives (Alberta Association of Midwives, 2006) believe informed choice is a decision-making process which relies on a full exchange of information in a non-urgent, non-authoritarian, cooperative manner and strive to facilitate decision-making by sharing relevant information with their clients as a component of optimal midwifery care. The extent to which midwives are interested in providing informed choice is seen by a three day conference presented by the Royal College Midwives in Brighton in May of 2007 entitled Midwives Delivering Choice (Royal College of Midwives, 2007) and described as being designed to inspire and energise midwives.

Although it has been suggested that excessive choice may cause confusion and unhappiness (Schwartz, 2004), there is abundant evidence that midwives wish to provide the accurate and unbiased information women desire to help them make informed choices (Lavender and Chapple, 2004) but what is meant by choice is far from clear (Lindsay, 2006). Women do not always feel they have a choice (Bick et al., 2004) or the choice they have is limited by the options available (Anderson, 2002) or the opinions of those giving the information (Neiger, 2004). Midwife scholars have suggested that what many women actually experience is a 'fantasy of choice' (Lewis, 2007) or 'informed compliance' (McCourt, 2006, Stapleton et al., 2002). There is an emerging interest in studying the highly complex activities which are needed to facilitate informed choice (Levy, 1999). The initial research suggests that midwives may use a process of protective steering when providing information to direct women to make what the midwife considers to be the best choice under the circumstances (Levy, 1999).

Despite the widespread commitment among midwives to providing information to support client choice, some midwives lack autonomy and find choice provision difficult due to hospital protocols, hierarchical organizational structures and fears of challenging those in authority by supporting safe, evidence-based choices of childbearing women (Hollins Martin and Bull, 2006). Choice for women is contingent on midwives having occupational autonomy (Monk, 2006) over their practice and the organization of their work (Sandall, 1995) in addition to the freedom to advocate for a woman who makes a choice that is not supported locally (Kirkham et al., 2002).

Unfortunately, Milgram (2004) argues, obedience to superiors is inherent in human nature as in hierarchical relationships people have a propensity towards submission to authority. That midwives may feel unable to provide women with choice is no small matter as by not doing so they may be contravening the rules of professional practice (Lewis, 2007) and a lack of choice can result in a fractured or non-existent relationship between a woman and her midwife (Department of Health, 2007). A number of strategies to empower midwives in hierarchical systems to provide choice for women have been suggested (Hollins Martin, 2007, Lavender and Chapple, 2004) but as yet none are known to have been implemented or evaluated.

3 3.2 Alberta Elements Omitted from the Studied Models

As described in Chapter 2 the sixth and seventh elements of midwifery in the Alberta model of midwifery are Accountability and Evaluation of Practice and Research on Effectiveness of Midwifery Care. Although there is a strong potential that these final two elements have a role to play as elements that affect the outcomes of midwifery practice, for reasons described earlier in this chapter, they have been omitted here and only included indirectly through the Autonomy element.

To be accountable is to be responsible and required to account for one's conduct (Allen, 1990) and accountability has been identified to be a trait that contributes to exemplary midwifery practice (Kennedy, 2000). A midwife is accountable for her own actions and the professional advice she gives (International Confederation of Midwives, 2005b) to those who use her services (Association of Radical Midwives, 1986). A connection between accountability and autonomy has been suggested by which midwives who lack autonomy tend not to see themselves as accountable for their practice so much as accountable to the institution that employs them (Stevens, 2003). Conversely, midwives who have greater autonomy develop a stronger sense of professional accountability. Midwives understand that to be accountable it is necessary to be involved in the evaluation of their practice primarily by asking women about the care they received and reflecting on their responses (Homer et al., In Press) to improve the standard of the care they provide. The

International Confederation of Midwives believes that acceptable standards of midwifery practice, education and management are based on reliable and valid research and accurate evaluation of midwifery practices (International Confederation of Midwives, 2008) and that all midwives have a role and a responsibility in advancing the knowledge and efficacy of midwifery that is essential for improvement in the health of all women and childbearing families (International Confederation of Midwives, 2005c).

3.3.3 Operationalization of the Alberta Elements

The five revised elements of the Alberta model of midwifery; Partnership, Continuity, Autonomy, Community and Choice; were used to represent the Canadian model. To facilitate their use in the classification system developed in this thesis the elements were operationalized as presented in Figure 3.7

Operationalized Alberta Elements
Partnership
Expressed intention to form partnerships Opportunities for relationship building provided Women perceive reciprocal interactions with midwife
Continuity
Expressed intention to provide continuity of care Midwives schedule allows for continuity of care Continuity provided throughout AP, IP and PP periods
Autonomy
Midwives are self employed Midwifery is a self governing profession Midwifery practice is managed by midwives
Community
Practice base is located in the community Midwives and other providers collaborate effectively Midwives active in community activities
Choice
Expressed intention to provide informed choice Choice of birth setting promoted Women perceive themselves as included in decision making

Figure 3.7

3.4 Application of the Classification System

In chapter 4 the literature review will be continued focusing on models of midwifery that have been evaluated and selected outcomes chosen for their potential to be sensitive to the effects of elements of midwifery models. A process of using a classification system and a series of visual

representations as a basis for further exploring the results of the reviewed midwifery evaluations will be tested. The purpose of the re-examination will be to seek patterns or trends within the relationship between elements of midwifery and selected childbirth outcomes that can be addressed in further research.

Chapter 4: An Exploration of Reviewed Evaluations of Midwifery Models

Overall, study of recently introduced midwifery models has generally suggested healthier childbirth outcomes when comparing them with the existing models but there has been little research that specifically links elements of midwifery models to outcomes (Kennedy, 2001). "There are critical deficits in knowledge about midwifery practice; therefore, research is essential to gain insight about the elements of the midwifery model and their relationship to outcomes" (Kennedy, 2000 p. 4). Lack of an accurate description of what elements of care are present and how models of care are organized and delivered in the limited amount of research that has been published makes interpreting results challenging (Kaufman, 2000). Difficulty in interpreting results is compounded as the data are generated from different sources and often have different definitions and denominators (Sandall et al., 2001b). While caution clearly must be used when combining data from various published reports (Sandall et al., 2001b), doing so could prove useful in developing more precise definitions of elements of midwifery models and lead to more standard use of outcome measurement in future studies. When similar variables reveal trends that may be indicative of more robust findings they can provide direction for the development of hypotheses for future research.

To provide structure for analysing and interpreting the aggregated findings of a number of evaluation studies, I developed a classification system based on the degree to which a model of midwifery contains the elements that are part of the Alberta midwifery model. In this chapter the classification system and its application to the models in the reviewed literature are described. In addition, the birth outcomes which were selected for study because of their potential sensitivity to the effects of elements of midwifery models are identified and described. A process of visual representation is then used to re-examine the relationship between the individual and combined elements and the selected outcomes for the previously reviewed articles. Because of

the exploratory nature of this examination, no attempts were made to make convincing deductions nor to discover definitive conclusions and the use of relative words such as lesser or greater and directional words such as trend or difference are intended literally; no statistical or clinical significance is intended or implied unless specifically stated. Clinical significance is assigned on the basis of my personal clinical judgement as an experienced, practising midwife. The re-examination is merely a way to explore the results of the ensemble of midwifery evaluations previously reviewed from a different perspective. The purpose of the examination is to begin seeking patterns or trends within the relationship between elements of midwifery and outcomes which could provide focus and direction for subsequent inquiry or give clues about appropriate future research questions.

4.1 Evaluation of Models in the Literature

My review of the literature, which was described in Chapter 3, revealed 37 evaluations of models of midwifery from various locations which were considered for further examination using the criteria summarized in Table 4.1

Inclusion Criteria for Further Exploration
Provides adequate description of models
Compares midwifery with midwifery
Full course of midwifery care is provided
Compares a minimum of 5 selected outcomes

Table 4.1

Only evaluation studies in which models are described well enough for it to be possible to consider them in relation to the Alberta model with some confidence and which compare midwifery with midwifery[5] were included in the re-examination. Studies which compared midwifery care with care provided by non-midwife maternity care providers, most often physicians, were excluded because they have only been carried out in countries where midwifery is not established and so the focus is on midwifery rather than different models of midwifery. In addition there is a lack of direct comparability between these studies and studies where different models of

[5] Comparing models of midwifery with other models of midwifery as opposed to comparing models of midwifery with models of other professionals or care providers.

midwifery are compared. Only models in which midwives provided a full course of care including antepartum, intrapartum and postpartum were included. Studies of models which did not report on at least five of the outcome variables selected as the focus of this thesis were excluded. Consequently, 22 of the model evaluations which were considered for inclusion here were rejected for the reasons identified in Table 4.2.

Models Excluded from Further Exploration			
Rejected Model	**Location**	**Rationale for Exclusion**	**Citation**
Team midwifery	Eng land	Insufficient outcomes	(Ward and Frohlich, 1994)
Nurse midwifery team	Canada	Compared to physician group	(Kaufman and McDonald, 1988)
Midwifery Care in Ontario	Canada	Compared to physicians	(Kaufman et al., 2001)
Nurse-midwives	Canada	Compared to family physicians	(Buhler et al., 1988)
Community-led maternity care	England	Insufficient outcomes	(Fleissig et al., 1996)
Independent midwifery	England	No comparison group	(Milan, 2005)
Changing childbirth scheme	England	Insufficient outcomes	(Spurgeon et al., 2001)
Shared care maternity program	Canada	Shared care model no comparison	(Westview Regional Health Authority, 2001)
Midwifery pilot projects	Canada	Compared to physicians	(Blais and Joubert, 2000)
Team midwifery	England	Insufficient outcomes	(Todd et al., 1998)
Caseload midwifery:	England	Inadequate description of model Insufficient outcomes	(Freeman et al., 2005)
One-to one caseload midwifery project	England	Results not published	(Berry, 2005)
Team midwifery	England	Inadequate outcomes	(Hart et al., 1999)
Changing childbirth project	England	Inadequate description of model Inadequate outcome data	(Warriner et al., 1998)
Team midwifery	England	Insufficient outcomes	(Henderson and Grant, 1996)
Quebec pilot projects	Canada	Compared to physicians	(Fraser et al., 2000a)
Rural midwife-managed unit	England	Inadequate description of model insufficient outcomes	(Watts et al., 2003)
Team midwifery	England	Insufficient outcomes	(Tinkler and Quinney, 1998)
Midwife-led unit	Scotland	No comparison group	(Mahmood, 2003)
Team midwifery	England	Insufficient outcomes	(Hicks et al., 2008)
Caseload midwifery	England	Not yet formally published therefore inadequate description of model and Insufficient outcomes	(Finlay et al., 2007)
Midwives Unit	Scotland	No antepartum or postpartum care provided	(Hundley et al., 1994)

Table 4.2

At least eight additional studies which might have meet the criteria for inclusion are known to exist but were either not published, are yet to be published or were otherwise inaccessible. Many more pilot projects have

been introduced but have not been evaluated. The three western Canadian studies were not included. These three studies, the randomized controlled trial (Harvey et al., 1996) and the prospective comparative evaluation (O'Brien et al., 2004) that were carried out in Alberta and the retrospective comparative evaluation (Janssen et al., 2002) that was carried out in British Columbia, were designed primarily to compare midwifery with existing medical model care and therefore they lacked direct comparability with studies where different models of midwifery are compared. They will, however, be reviewed in relation to each other and in greater depth in Part 3 of this thesis.

Fourteen studies met the criteria for inclusion in the review and are listed in Table 4.3. One of the studies included an original cohort study conducted in 1994-5 (McCourt and Page, 1996) and a follow-up cohort study conducted in 1997-8 (Beake et al., 2001) which were treated as two separate studies. In two studies (Flint and Poulengeris, 1987, Turnbull et al., 1996), where a second comparison group was compared, the second groups were excluded as they did not meet the inclusion criteria. As a result, 30 models from 15 studies were included and were submitted to the classification process. All evaluations in the review compared a newly introduced model of midwifery with an existing traditional or standard model in terms of various outcome and process variables.

Models Included in Further Exploration			
	Model	**Location**	**Lead Author**
1	**Albany Midwifery Practice**	England	Sandall
2 & 3	**One-to-One Midwifery** x 2 Studies	England	McCourt
4	**BUMPS Practice**	England	Benjamin
5	**KYM Team Practice**	England	Flint
6	**Team Midwifery**	Australia	Biro
7	**Caseload Midwifery**	England	North Staffs Research Team
8	**STOMP Community Care,**	Australia	Homer
9	**PHMC Partnership Caseload Midwifery Care**	Australia	Johnson
10	**MDU Midwife-Managed Care**	Scotland	Turnbull
11	**BCG Birth Centre Midwifery**	Sweden	Waldenstrom
12	**Home from Home Scheme**	England	MacVicar
13	**Midwife Team**	Australia	Rowley
14	**TMP Team**	Australia	Kenny
15	**Team Midwife Care**	Australia	Waldenstrom

Table 4.3

4.2 The Classification System

The classification system was designed to facilitate discussion in this thesis of the difference or lack of difference in outcomes for various elements of the Canadian midwifery model and to contribute to the development of an inductive platform from which rigorous, scientific enquiry into which elements or dimensions of midwifery care are related to specific outcomes may be conducted (Kennedy, 2000). Lack of descriptive data for the elements of models, failure of descriptive data to adequately reflect reality and limited or absent definitions of outcomes for the evaluations reviewed are potential limitations of the classification system and will be discussed later in this section.

The classification system was applied to each model in the reviewed studies which met the inclusion criteria. The classification assigned indicates how broadly similar a model is to the Canadian model. The elements classified were based in those set out in the Alberta Principles of Midwifery Care described in Chapter 2 as modified and refined as described in Chapter 3. The strength of a model being classified in relation to this model was determined by assigning a score from 0 to 2 for each of the elements it contained with 0 representing absence of the element, 1 representing partial inclusion of the element and 2 representing inclusion of the complete element. Scores were assigned for the newly defined elements of Partnership, Continuity, Autonomy, Community and Choice. A sum of the scores for the five elements represents the overall strength of the model and can range from 0 to 10.

4.3 Usefulness of the Classification System

There are a number of factors that may limit the usefulness of the classification system in determining the strength of models.

4.3.1 Elements of Midwifery

When reviewing the literature it was immediately obvious that the widespread lack of a comprehensive description of elements that constituted the models studied would make classification difficult, if not impossible, in many

instances. Typically, where two models were compared, the newly introduced model was described only by its variation from the existing standard care model, apparently assuming the reader to be familiar with the existing model. This difficulty was compounded by the fact that often the difference between models was as small as one element, such as continuity of care; hence only one element from the new model and no elements of the existing model were described. In some instances, it was necessary to exclude the study from this exercise, owing to lack of sufficient descriptive data of good quality.

From personal knowledge of models in some geographic locations and background information from published literature (Pairman et al., 2006, De Vries et al., 2001) it was clear to me that even when an element was described it did not, necessarily, fully reflect the reality of practice in that region. This was particularly evident in some studies where choice of a home birth was noted as an option for a model and it was known to me that in practice the option of home birth, while formally available, is neither advertised nor promoted and in some cases is actively discouraged, resulting in only women dedicated to home birth actually being likely to achieve one. In the majority of these cases, the perceived actual lack of choice was supported by the low or absent rate of out-of-hospital births in the results of the evaluation. Autonomy was another, more subtle, example of an element that was difficult to classify but potentially one that is more relevant as little is known about it in terms of outcome and its perceived importance in the Canadian midwifery model. The largely quantitative nature of the studies reviewed and their focus on process and outcome measures, with little work focused on the nature or content of care or midwives' experiences may be one reason why autonomy has not been included in the evaluation of midwifery models. Possibly because true autonomy has been absent from midwifery in most high income countries for so long it was only addressed in two of the studies reviewed.

4.3.2 Outcomes Studied

The difficulties with classification were not the only challenge to this method of reviewing models. The comparison of outcome variables was difficult due to the limited definition and lack of consistency across studies. The outcomes studied were selected maternal and neonatal clinical outcomes and maternal satisfaction outcomes and are extensively described in the next section. An extreme, but illustrative, example was measurement of newborn wellbeing as an outcome. Although cord blood measurements are regarded as the most reliable measure of newborn wellbeing, of 15 studies only two reported cord blood measures. While unfortunate, this is understandable in midwifery practice as some degree of technical support is necessary to obtain cord blood measures (Wiberg et al., 2008) and it is not always possible when birth occurs in an out-of-hospital setting or when cord cutting is delayed (Harris et al., 1996). While not considered to be as reliable a measure as cord blood measurements, Apgar scores are also used as a neonatal wellbeing outcome. The percent or rate of Apgar scores recorded at less than seven at one and five minutes after birth is the accepted standard method of reporting for research purposes (Cunningham et al., 2005). Of the 13 studies that reported Apgar scores, only four used the accepted standard. Nine different ways of reporting Apgar scores were identified which ranged from the median Apgar score at five minutes (MacVicar et al., 1993) to the percent of scores between eight and 10 at one minute (Flint and Poulengeris, 1987).

The selected studies used qualitative, quantitative and mixed methods of research. Selecting studies to be included in the review without regard to the methods used is a further limitation of this approach to examining the findings of multiple studies. Reviewing studies of models of care which use multiple techniques is complex and problematic (Waldenstrom and Turnbull, 1998) but attempting to do so can generate valuable insight on which to base future research. The potential for lack of scientific rigour in the selected studies was mitigated by applying the Quality of Study Summary checklist (McCourt et al., 2007), developed for the purpose of assessing quality of multiple methods research, to each study. All studies were found to be of acceptable research quality. A summary of the assessment is presented in

Appendix A. In addition nine of the selected studies were controlled trials that have been assessed using the Cochrane clinical trials criteria (Hatem et al., 2008). Therefore, despite its challenges, a cautious interpretation of the findings of this review is warranted.

4.4 Selected Outcomes of Studied Models

4.4.1 Outcome Variables

Although it is possible that many variables may be of interest the number examined was restricted for expediency, despite a possible limitation to the review. Table 4.4 presents the eight outcome variables selected for use because of their potential to be affected by the elements which make up a model of midwifery.

Outcome Variables
MATERNAL OUTCOMES
Type of Birth
Induction
Augmentation
Epidural
Episiotomy
NEONATAL OUTCOMES
Apgar Score
Neonatal Intensive Care Admissions
SATISFACTION
Various satisfaction and process outcomes

Table 4.4

These eight selected outcomes had shown a significant difference between midwife and physician models in the randomized controlled trial that I had previously conducted (Harvey, 1996). It was postulated that these eight were more likely to be sensitive to models of care than other variables that had not been shown to be significantly different in the trial. In addition the eight selected outcomes are among those commonly used in research and were reported in enough studies to facilitate their inclusion in the review. As noted in 4.2 five maternal outcome variables were reported in all studies and were selected for inclusion. No neonatal outcomes were reported consistently but two were reported in all but two of the studies and were also included. Satisfaction or a proxy for satisfaction was reported in the majority of the studies reviewed and will be discussed separately due to their qualitative nature and the great variety of measures used.

4.4.1.1 Clinical Outcomes

4.4.1.1.1 Type of Birth

The type of birth or manner in which a birth occurred is a well recognized clinical outcome indicator. Birth type is characterized by whether the birth occurred naturally or following an intervention. Types of birth observed in research are categorized as normal birth, assisted birth and Caesarean birth. When the studies for inclusion in this ensemble of models were reviewed in relation to birth type, great variation in how birth type was categorized and reported was found. Although, a midwifery approach suggested the obvious indicator of successful outcome should be normal birth, lack of understanding of what constitutes a normal birth and inconsistent reporting of it made using normal birth as a representative indicator of birth outcome impossible. The most frequently reported type of birth outcome was, in fact, Caesarean section which was reported for all models.

Caesarean section was therefore selected as the type of birth indicator against which to consider the effects of models. The World Health Organization recommends Caesarean rates should not be in excess of 15% in a population, a figure greatly exceeded in most developed health care systems (Ronsmans et al., 2006). Rate of Caesarean section was expected to be a consistent indicator which could be compared with confidence. Unfortunately, this was not the case and although all studies reported a rate of Caesarean birth, lack of a common definition for types of caesarean birth resulted in the need to select the rate to be used. The total Caesarean birth rate was chosen as it was most frequently reported or able to be calculated from data reported. In those cases where the total rate was not extractable the available rate that most closely approximated total Caesarean section rate was used.

4.4.1.1.2 Labour Stimulation

Labour stimulation is made up of two outcome indicators, induction and augmentation of labour and may be associated with increased Caesarean section rates (Kotaska et al., 2006). As with type of birth, all studies reviewed reported rates of labour stimulation but there were very few definitions of

augmentation or induction and far from total consistency in how the rates were reported. While the majority of researchers reported rates labelled induction and augmentation there were also two that specified oxytocin induction and oxytocin augmentation and one that specified Syntocinon induction and labour augmentation.

Only one other method of induction was referred to with one study reporting rate of amniotomy. Artificial rupture of the membranes is a common method of inducing or augmenting labour and while it is probable that it was included in some of those studies which reported labour induction and stimulation without specifying a method, it is surprizing that it was not considered independently in more studies. The rates selected were those which most closely represented the total rates of induction and augmentation of labour from the results reported.

4.4.1.1.3 Epidural

The measurement of the rate of epidural as an outcome indicator is fraught with difficulty as an epidural may be given as an analgesia for pain relief or as an anaesthetic for surgery. Consequently, charting may be in different places on the client record and by practitioners from different disciplines or departments. Also clinicians rarely recognize the importance of documenting the reason for the administration of an epidural. Therefore, extracting the data to ascertain all cases where epidural was administered and for what purpose they were administered may not be possible. Nevertheless, epidural administration is an important outcome indicator as the use of epidurals for pain relief has been identified as the starting point of a cascade of interventions which increase the risk of poor outcomes for mothers and babies (Klein, 2006, Anim-Somuah et al., 2005).

All of the studies reviewed included a measure of rate of epidural as an outcome and the majority did not elaborate on what was meant by epidural. Only two authors differed by reporting combined epidural and spinal rates confirming the suspicion that when little or no definition of an outcome variable is provided it is impossible to have confidence that what is reported is actually what it appears to be. As none of the studies reviewed contained

more than one measure of epidural, whatever rate was reported was the one used in considering the effects of elements of midwifery models on epidural administration.

4.4.1.1.4 Episiotomy

Episiotomy is an intervention which is very much within the realm of control of the midwife when she assists a mother with the birth of a baby and many midwives pride themselves on keeping the number of episiotomies they perform very low. Rate of episiotomy is therefore a good indicator for use when considering the effects of elements of midwifery models on perineal integrity. All studies reviewed included an overall episiotomy rate and many provided a variety of additional information about aspects of perineal integrity including degree of trauma, requirement for repair and type of episiotomy performed again demonstrating the lack of conformity across studies in reporting outcome indicators. When perineal integrity was reported, as well as episiotomy rate, there was no evidence to indicate that a reduced episiotomy rate translated into a higher rate of perineal trauma except in one study. In the study where a significantly lower rate of episiotomies was reported for the study group a significantly higher rate of perineal tears was also reported. Interestingly, the same percent of women required suturing for either episiotomy or tears in both study and control groups. As the only consistently reported measure of perineal trauma, the total episiotomy rate was used to represent outcomes of perineal integrity for considering the effects of elements of midwifery models.

4.4.1.1.5 Apgar Score

Apgar scoring is an important and reasonably reliable method of assessing neonatal well-being (Cunningham et al., 2005) and was reported in all but two of the studies reviewed. As discussed in more detail in 4.2 as a limitation of the classification system, the lack of consistency in the way in which Apgar scores are reported severely limits the accuracy of comparison across studies. This is particularly unfortunate for Apgar scores as they are a standardized measure and if reported consistently could be compared across populations with greater confidence. Apgar score rates which were reported

as a number were converted to a percent and those which gave the rate as the percent of babies with positive outcome were reversed to gain as much similarity between methods of scoring as possible and to keep the positive-negative values in the same direction. Most studies included more than one method of Apgar reporting and therefore when there was a choice the method which was, or could be converted to be, closest to a percentage of scores less than 7 at five minutes after birth, that method was selected. The five minute Apgar score was selected over the 1 minute score as more studies reported the 5 minute rather than the 1 minute score. The rate of Apgar scores less than 7 at five minutes after birth was therefore the measure used for the review. When there was no choice, whatever was reported was used.

4.4.1.1.6 Neonatal Intensive Care Admissions

The need for intensive medical care is an indicator of a serious and costly outcome. It is therefore an important indicator to include when considering the effects of elements of models of midwifery on neonatal well being. Although what constitutes a neonatal intensive care unit was rarely defined in the studies reviewed and a number of different names and acronyms were used to describe them, all but one of the studies reviewed provided some measure of how many babies were admitted to or retained in a unit where additional medical care was provided. All of the reviewed studies that provided a rate of admission to neonatal intensive care units gave them as a percentage of the total of all births or a measure that could easily be converted to a percentage of all births. Therefore, the measure used in the review of studies was the percentage of admissions to a unit which provided advanced medical care and the term neonatal intensive care unit was used to describe such a unit.

4.4.1.1.7 Descriptive Statistics for Clinical Outcomes

A comprehensive chart of all reviewed and classified models and their maternal and neonatal outcomes for the selected variables is presented in a table of descriptive statistics which, due to its large size, is appended as Appendix B. Whether, a model accepted low risk women only or was open to

women of all risks is indicated in the table by the placement of (A) adjacent to the names of models that accepted women regardless of their degree of risk. Whether reported differences were statistically significant or not is also indicated by a number in the chart.

4.4.1.2 Satisfaction Outcomes

4.4.1.2.1 Satisfaction

The measurement of women's satisfaction with birth experience is a methodological problem (Green et al., 2000) and trying to use satisfaction as an indicator of the effects of the elements of a model compounds the problem. This is unfortunate as client satisfaction is increasingly being regarded as an important indicator of the quality of care (Shearer, 1989). A full discussion of measuring satisfaction as an outcome is included in Chapter 5.

Three of the studies considered for inclusion in the review either did not measure or did not report satisfaction at all and those that did measure it used a wide variety of different indicators of satisfaction. Other than satisfaction itself, variables used in the studies included measures of process, women's evaluation of the care they received and maternal outcomes potentially associated with satisfaction, such as continuity of care or carer, provision of informed choice and postnatal depression. All of the studies that did measure satisfaction or associated variables reported predominantly more positive responses for women receiving care from midwives in the higher strength model of a pair of models.

4.4.1.2.2 Summary of Satisfaction Outcomes

It proved impossible to find a thread of similarity for the measurement of satisfaction throughout the reports. The lack of congruity and high number of reports that did not address satisfaction at all resulted in a decision not to include satisfaction in the review of the effect of elements of midwifery models on outcomes. However, a full summary of the reported satisfaction outcomes is presented in Appendix C.

4.5 Strength of Models

The strength of the models, in terms of the elements of the Alberta model, in the evaluations that had met the primary criteria for inclusion in the review was derived by applying the classification system to each model. Details of how each score was calculated are shown in Appendix D. Following classification it was noted that in six studies none of the models included in the evaluation scored more than four. Consideration was given to excluding these models on the basis that they were not considered similar enough to the model of interest in this thesis. However, I decided to include the studies with models which received lower scores as including these models may lead to a broader understanding of midwifery models in general and, by contrast, about the central model of interest. The scores assigned to the models with at least one model having a score of 5 or above are presented in Table 4.5 and the scores assigned to models with both models having scores below 5 are presented in Table 4.6.

Studies with Models Scoring 5 or Above								
Model			Score					
No	Type	Lead Author	Partnership	Continuity	Autonomy	Community	Choice	Total
1	ALBANY MIDWIFERY PRACTICE	(Sandall)	2	2	2	2	2	10
	ALBANY COMPARISON GROUP COMMUNITY	(Sandall)	1	1	1	2	1	6
2 & 3	ONE-TO-ONE MIDWIFERY	(McCourt 1)	2	2	1	1	2	8
	ONE-TO-ONE MIDWIFERY COMPARISON GROUP	(McCourt 2)	1	1	1	1	1	5
4	BUMPS PRACTICE	(Benjamin)	2	2	1	1	2	8
	BUMPS CONTROL	(Benjamin)	1	1	1	1	1	5
5	KYM PRACTICE	(Flint)	2	1	1	1	1	6
	KYM CONTROL	(Flint)	1	0	1	1	0	3
6	Team Midwifery - Melbourne	(Biro)	1	1	1	2	0	5
	Midwifery Standard– Melbourne	(Biro)	1	0	1	2	0	4
7	North Staffs Caseload Midwifery	(N Staffs Research Team)	1	2	1	2	0	6
	North Staffs Shared-Care Midwifery	(N Staffs Research Team)	1	0	1	2	0	4
8	STOMP Midwifery	(Homer)	1	1	1	2	0	5
	STOMP Standard	(Homer)	1	0	1	0	0	2
9	Partnership Caseload	(Johnson)	1	1	1	2	1	6
	Partnership Caseload Control	(Johnson)	1	0	1	2	0	4

Table 4.5

Studies with Models Scoring Below 5								
Model			Score					
No	Type	Lead Author	Partnership	Continuity	Autonomy	Community	Choice	Total
10	MDU TEAM	(Turnbull)	1	1	1	0	0	3
	MDU CONTROL	(Turnbull)	1	0	1	0	0	2
11	Birth Centre	(Walden-strom [BC])	1	1	1	0	0	3
	BC Shared Care	(Walden-strom [BC])	0	0	0	1	0	1
12	H from H Scher	(MacVicar)	1	1	1	0	0	3
	H from H Contr	(MacVicar)	1	0	1	1	0	3
13	Midwife Team	(Rowley)	1	1	1	0	0	3
	Midwife Team Routine Care	(Rowley)	1	0	1	0	0	2
14	TMP Team	(Kenny)	1	1	1	0	1	4
	TMP Conventional Care	(Kenny)	1	0	1	0	0	2
15	Team Midwife	(Walden-strom [Team])	1	1	1	0	0	3
	Team Midwife Standard	Walden-strom [Team])	1	1	1	0	0	3

Table 4.6

In order to facilitate the easy recognition of the midwifery models throughout the following discussion, the lead author's name as it is presented in Tables 4.5 and 4.6 will be used to identify the various models.

4. 6 Visual Representations of Relationships

"Information visualization is a distinctive field of research, with less than 20 years history, that has rapidly become an interdisciplinary research field (Chen, 2006). It is the "use of computer-supported, interactive visual representations of abstract data to amplify cognition" (Few, 2010 p. 1).

"The value of diagrams is widely acknowledged in information representation and informal reasoning...to aid comprehension and communication" (Howse et al., 2004 p.170) Diagrams play an important role in visualizing information and thus conveying complex information in intuitive ways (Stapleton et al., 2008). A primary purpose of visually representing information as diagrams is to search for potentially meaningful patterns and trends which can then be examined by further research to gain understanding (Few, 2006). This type

of diagrammatic reasoning is a valuable tool for developing hypotheses from the results of multiple studies (Dau and Eklund, 2008).

There are a variety of types of diagrams, graphs and pictures that can be used for visual representation and spider diagrams were selected to represent potential relationships in this thesis as they are an excellent method of using a single diagram to display a number of results (Microsoft, 2009). Spider diagrams are a visual notation for expressing logical statements (Stapleton et al., 2004b) and are particularly useful when the objective of the visual representation is to assess the symmetry of the values being examined rather than comparing their magnitudes (Few, 2005) .

A spider diagram is laid out in a circular fashion with axis lines that start in the centre and radiate to the periphery (Few, 2005). An axis can represent an independent measure or a single measure broken into multiple subdivisions of a single category (Few, 2005). When appropriate, axes can be arranged in order around the circle according to convention or intuition (Few, 2010). Quantitative scales begin with the lowest value at the centre and extend toward the periphery with increasing numbers (Few, 2005). Lines which connect the values give the diagram the appearance of a spider's web and consequently points that denote elements of data are known as spiders (Stapleton et al., 2004a).

4.6.1 Visual Representation of Relationships for Midwifery Models

I began the process of visual representation by representing the relationship between all model pairs selected for inclusion and each of the selected outcomes in turn, using spider diagrams as presented in Figures 4.1 to 4.7. In the diagrams each axis represents the model for which it is labelled and the spiders represent the percentage rate for the outcome being examined.

The purpose of the representations was to support exploration of patterns in the relationships between different models of midwifery and outcomes of care, to enable the formation of hypotheses around those relationships. This would be visible as lines between spiders for pairs of models.

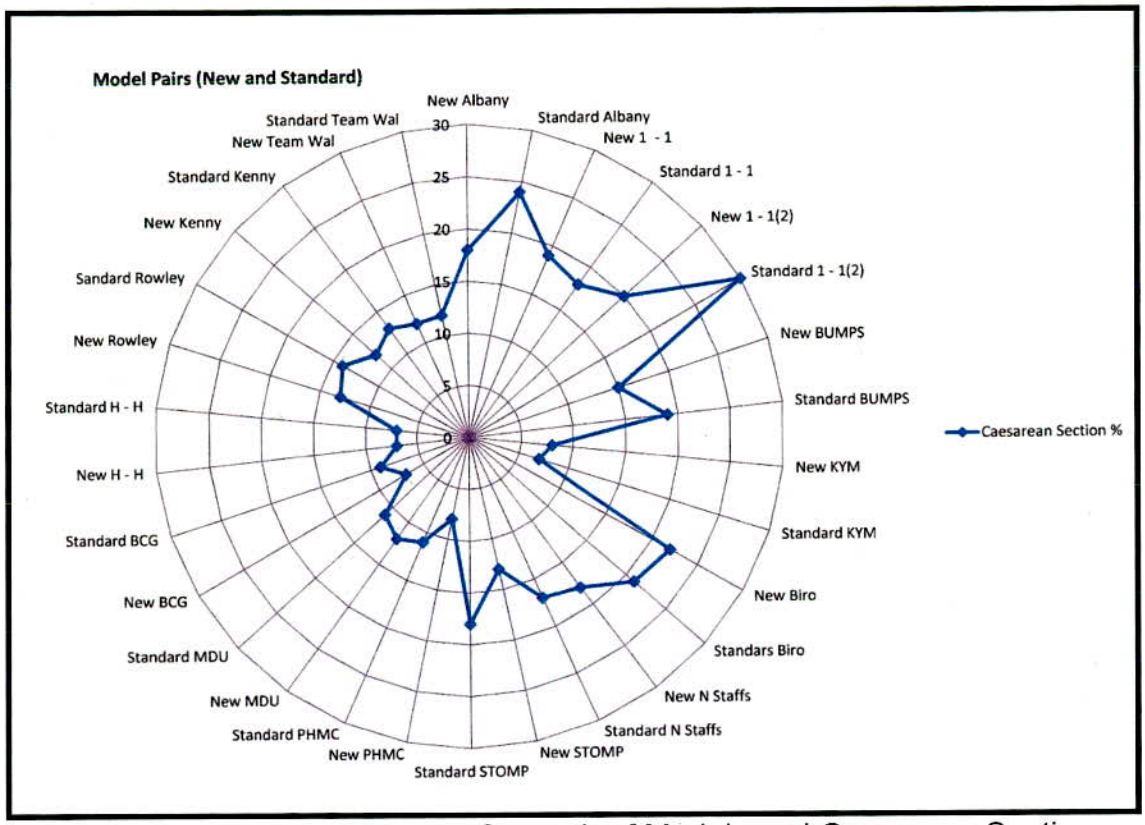

Figure 4.1 Relationship between Strength of Models and Caesarean Section Rates

While Caesarean birth rates were higher for standard models in the majority of pairs it is clear from this representation that this was not universally the case. What is notable is that Caesarean birth rate is in general lower for all models on the left hand side of the diagram which, although not discernable from this representation, is where the models with scores of lower than 5 are clustered. Why higher rates of Caesarean section might be associated with higher scoring models of midwifery in terms of the elements they contained is an interesting question as, since within pairs the higher scoring models generally have lower rates, one would intuitively expect that greater strength would be associated with lower rates in general. This unexpected observation suggests that factors other than the elements of midwifery, such as location, case mix or culture of care, may affect rates of Caesarean. However, it should be noted that, as can be seen in Appendix B, only 5 of the differences reported were shown to have statistical significance.

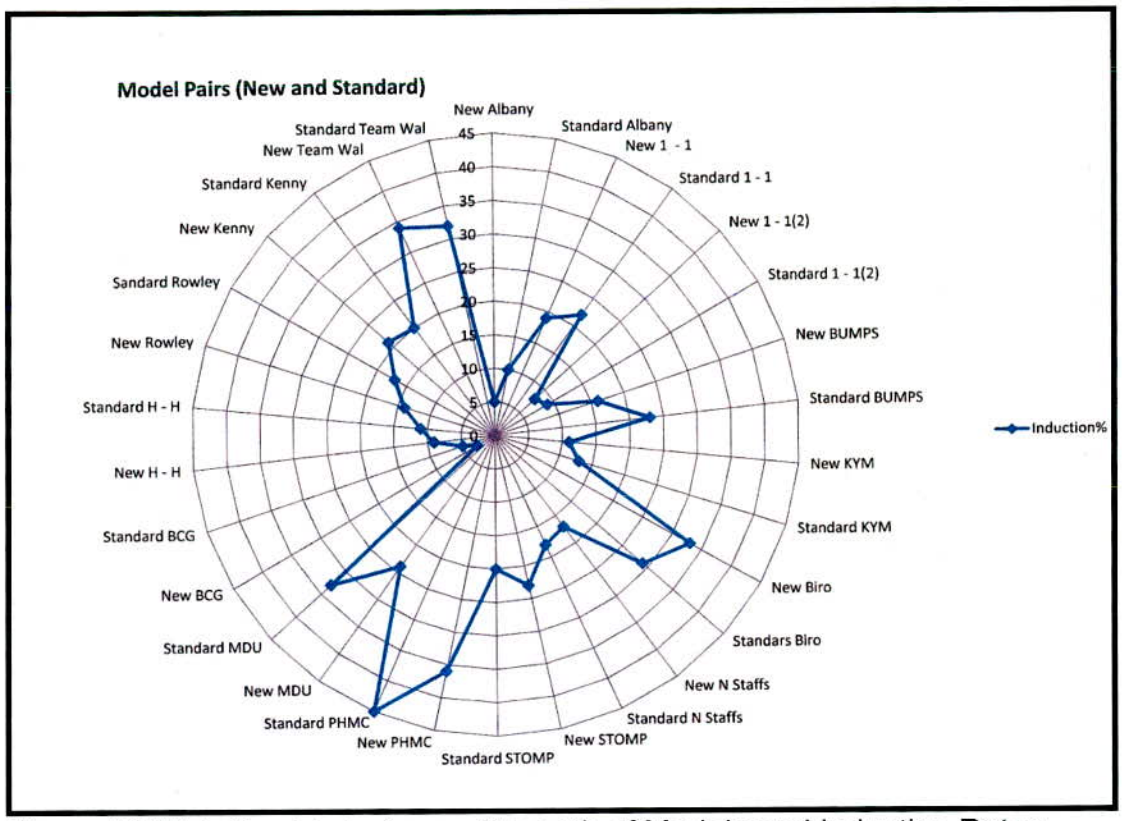

Figure 4.2 Relationship between Strength of Models and Induction Rates

In Figure 4.2, as with Figure 4.1, relationships between new and standard models would be visible as lines between spiders for pairs of models. Again, with induction, the overall trend appeared to be towards higher rates for standard models in the majority of pairs. In addition, there are several model pairs among those with scores less than five where the reverse is true (Johnson, Kenny, Waldenstrom[Team]) while all higher scoring model pairs show higher rates for standard models although, again, this is not discernable from this representation.

This observation stimulates a question whether models assessed to have lower scores in terms of the elements of midwifery lack ability to influence outcomes that may be under the influence of other factors that also affect outcomes. For example, midwives in a low scoring model may lack the autonomy needed to advocate for a woman to avoid routine induction. However, it should be noted that, as can be seen in Appendix B, only 2 of the differences reported were shown to have statistical significance.

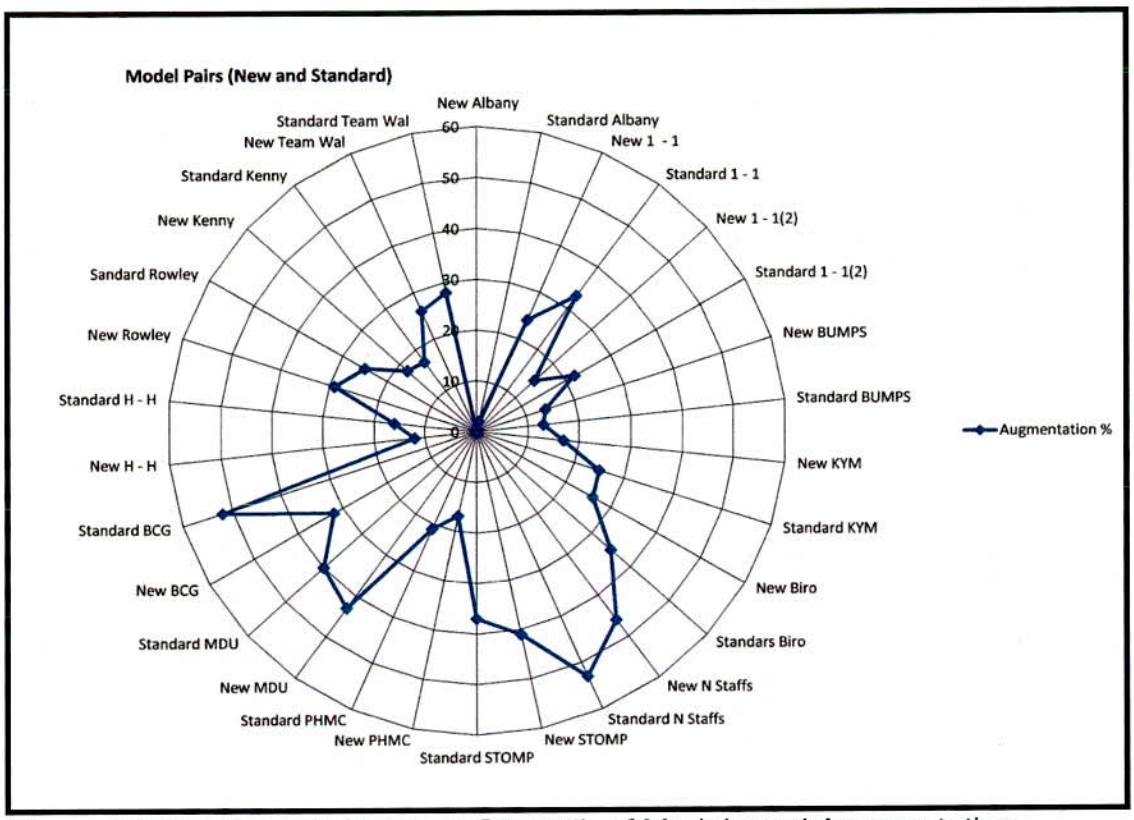

Figure 4.3 Relationship between Strength of Models and Augmentation Rates

For augmentation the general trend toward higher rates for standard models in pairs is evident again, although it is less clear than for Caesarean birth and induction with more mixed results in both high and low scoring models. One is tempted to wonder whether this might be a result of midwives having less influence over whether augmentation is implemented than they have over either Caesarean or induction, even though this might be contrary to intuitive thinking. However, it should be noted that, as can be seen in Appendix B, only 5 of the differences reported were shown to have statistical significance.

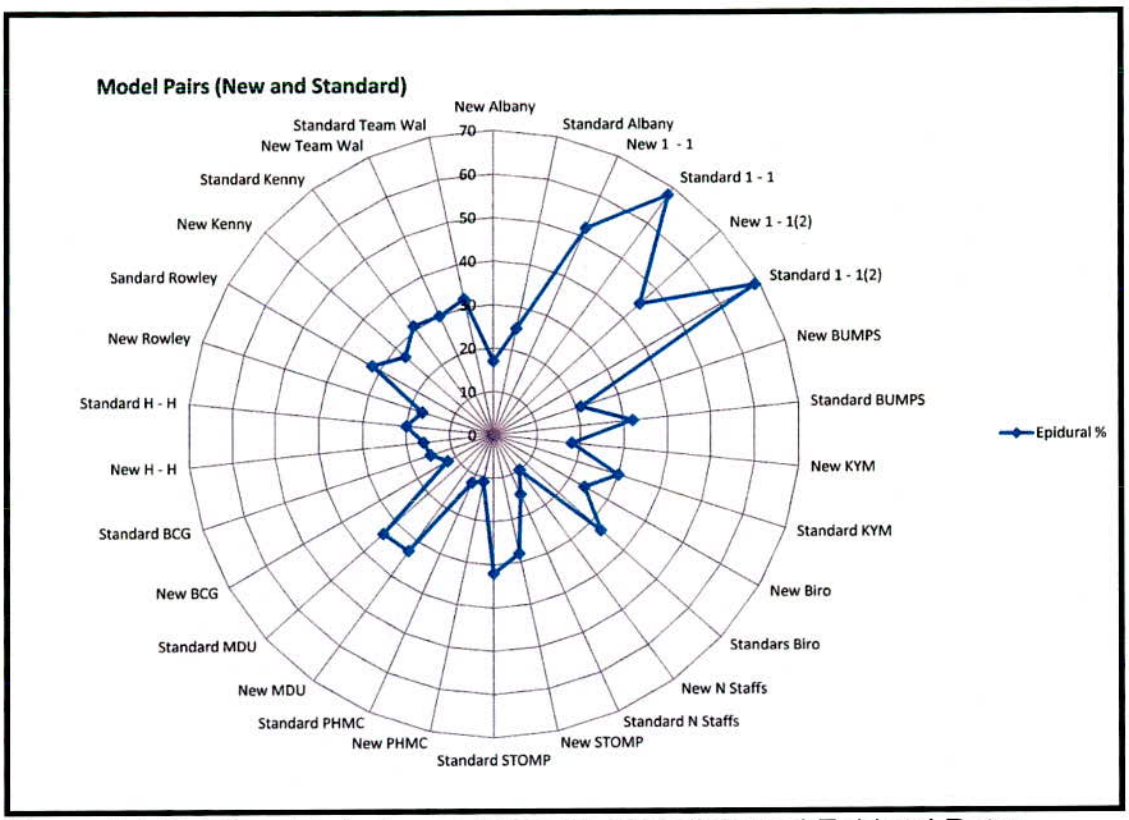

Figure 4.4 Relationship between Strength of Models and Epidural Rates

The trend toward higher rates for standard models is very evident for epidural as there are no model pairs where this is not the case for either high or low scoring models. This consistently observed higher rate for standard models within model pairs prompts the question of whether midwives might have greater ability to influence whether a woman receives an epidural than over other outcomes such as augmentation. However, it should be noted that, as can be seen in Appendix B, only 5 of the differences reported were shown to have statistical significance.

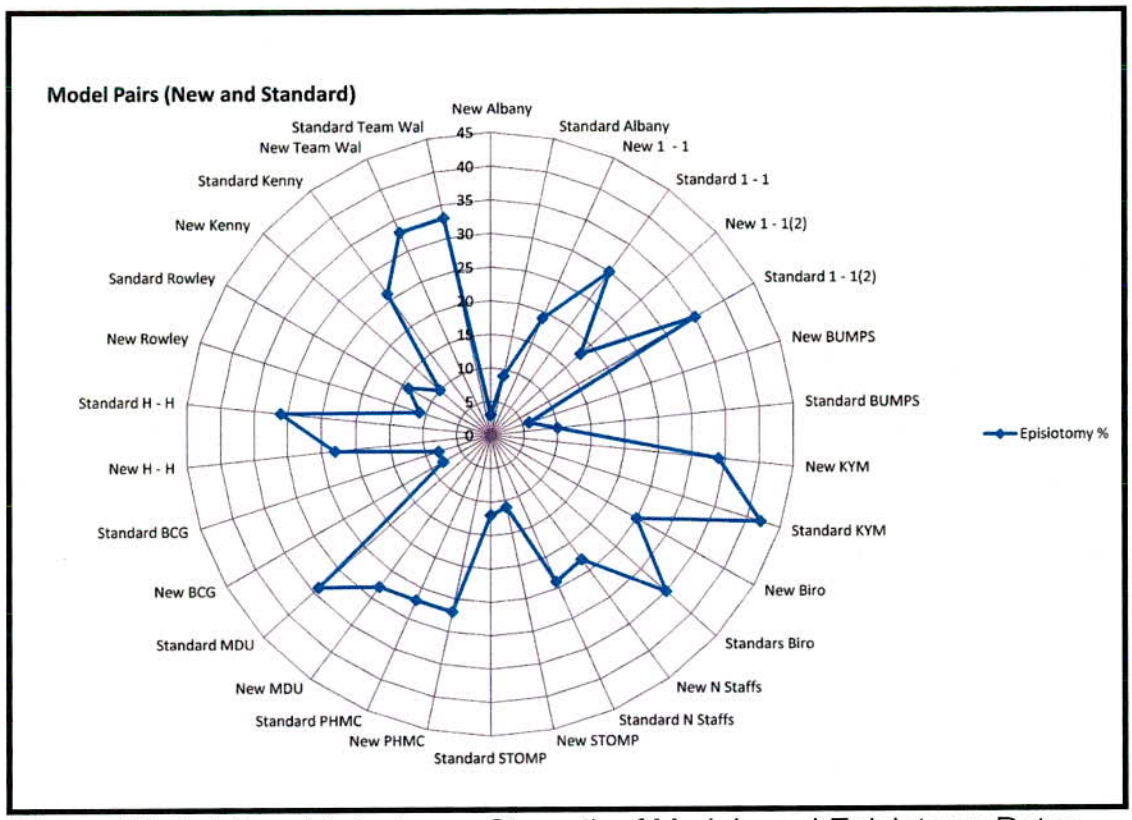

Figure 4.5 Relationship between Strength of Models and Episiotomy Rates

As with Epidural, the tendency towards higher rates for standard models of pairs is visible for episiotomy in this visual representation, with no model pairs where the reverse is noted and only three pairs where rates are the same (Johnson, Waldenstrom[BC] Waldenstrom[Team]). However, it should be noted that, as can be seen in Appendix B, only 7 of the differences reported were shown to have statistical significance. Based on the hypothesis that greater strength is associated with lower intervention rates, episiotomy is an outcome where I would have expected to see a relationship between outcome rates and the degree to which models were assessed to contain midwifery elements. Generally, except when complications occur and care is transferred, midwives initiate and perform the intervention on their own responsibility. If the scoring process was effective in accurately classifying models for the degree to which they contained the elements of midwifery and higher scores were related to lower outcome rates one would expect to see this pattern. While the pattern of relationship between episiotomy and the score of models in this visual representation resembles the expected pattern within model pairs it does not appear to be the case for

models in general. An obvious example is the episiotomy rate of 8% for a model with a score of 1 (Waldenstrom[BC]) and a rate of 34% for a model with a score of 6 (Flint). These observations should be considered with cognizance that one (Waldenstrom [BC]) was conducted in a Birth Centre and may not be as directly comparable with other models and the other (Flint) was the first of the studies evaluated having been conducted in 1989 or early in the movement towards more natural birth practices. It is recognized that other factors such as birth setting and when the study was conducted, which were not accounted for in this visual representation, may have affected the episiotomy rates. The overall pattern variation suggests that despite the hypothesis that midwives may be more able to affect episiotomy rates, issues to do with culture and ethos may remain dominant.

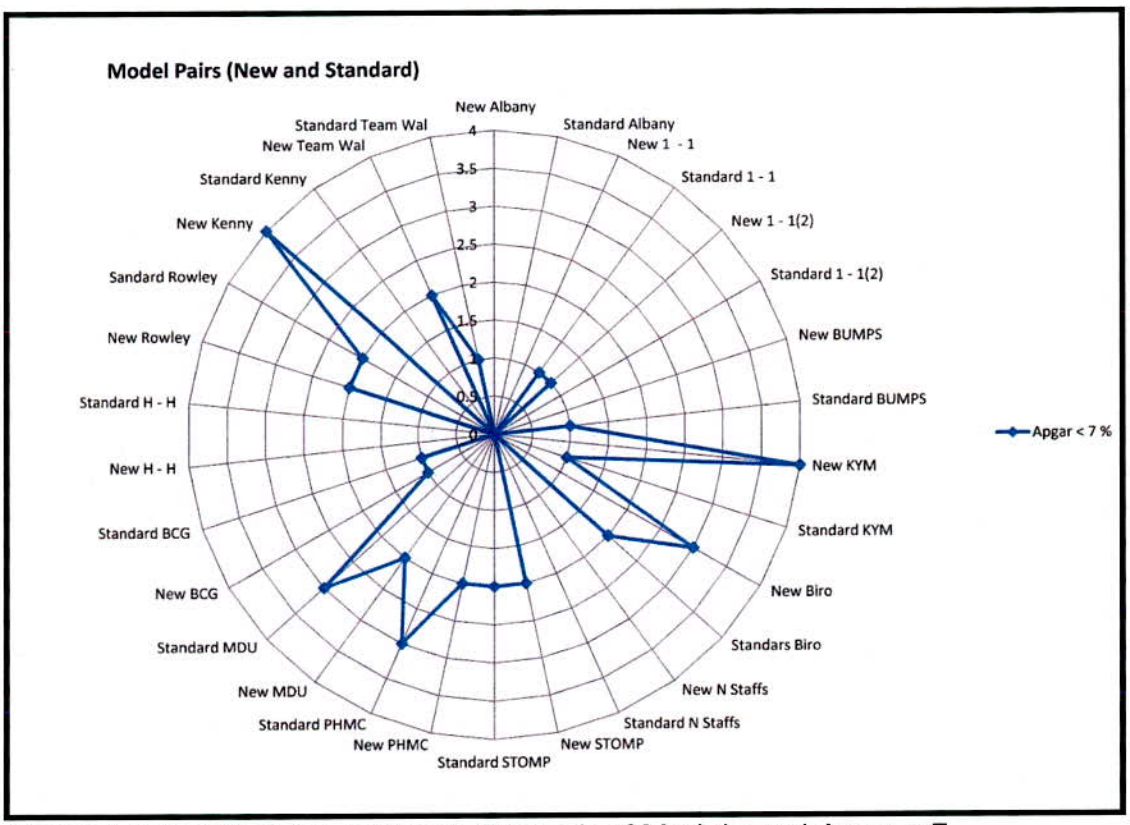

Figure 4.6 Relationship between Strength of Models and Apgar <7 Percentage Rates

No patterns or tendencies were visible in Figure 4.6 for the percentage rate of Apgar Scores less than 7 at five minutes as the direction of the line between the standard and new model in pairs differs with no apparent pattern throughout the visual representation. For five (McCourt 2, Flint, Biro,

Kenny, Waldenstrom[Team]) rates were lower for standard models and three (Homer, Waldenstrom[BC], Rowley) showed rates were the same for new and standard models in the pair meaning that less than half the model pairs for which results were reported in a usable form showed higher rates for standard models. However, it should be noted that, as can be seen in Appendix B, none of the differences reported were shown to have statistical significance. Also, none of the Apgar rates reported was greater than 4% meaning that any differences reported are very small. As discussed in 4.2, lack of good data related to Apgar reporting in the ensemble of models reviewed and insufficient power in some studies could be responsible for the absence of any pattern and why not even tentative ideas about the effects of midwifery on Apgar score can be derived from this review and visual representation. Nevertheless, this lack of clarity points to the need for further examination of the effects of elements of midwifery on this outcome.

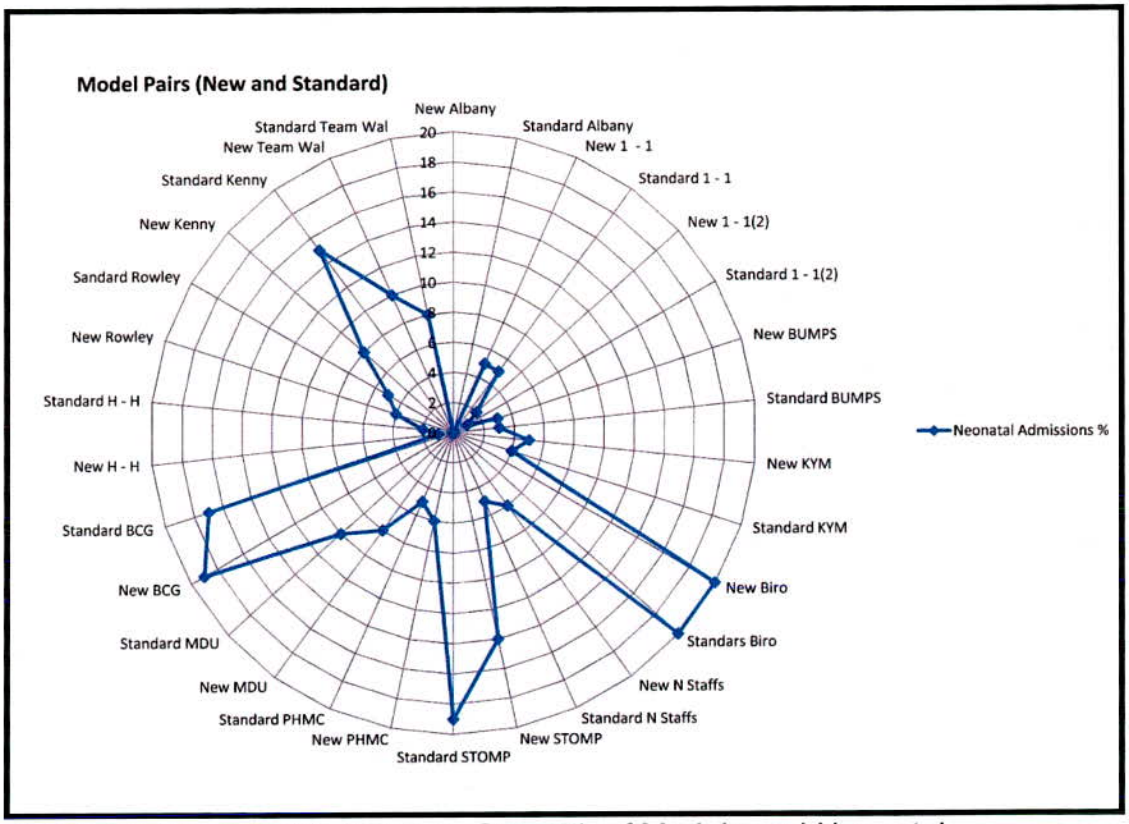

Figure 4.7 Relationship between Strength of Models and Neonatal Admissions

As with Apgar scores, rate of neonatal admissions showed no discernable tendency toward lower rates for either standard or new models within pairs. There were five models with higher rates for standard models (McCourt 2,

Flint, N Staffs Research Team, Johnson, Waldenstrom[BC]) none of which were statistically significant and six with higher rates for new models (Homer, Turnbull, MacVicar, McCourt 1, Rowley, Kenny).only one of which was statistically significant (Kenny) as shown in Appendix B. The remaining three model pairs (Benjamin, Biro, Waldenstrom [Team] showed rates that were the same for new and standard models.

Overall rates of admission were also notably varied from a clinical perspective when considered for pairs with rates ranging from 1% and 0% for one pair (Benjamin) to 20% and 20% for another (Biro). As with Apgar Scores, data for neonatal admissions was not generally presented in a manner that was designed to be helpful for review across different studies and settings. Most notably the lack of definition of the criteria for admission to the neonatal units, which are known to be widely variable between hospitals, stands out as a potential confounder.

The lack of statistical difference between midwife-led and other models of care for neonatal intensive care admissions is supported by a systematic review of eleven randomised trials which also reported a significantly shorter length of hospital stay for babies who received midwife led care (Hatem et al., 2008). Nevertheless, particularly in light of the continued concern in Canada with the safely of newborns whose mothers receive midwifery care, the high number of higher rates for new models observed for neonatal admissions coupled with the lack of higher rates for standard models for Apgar scores, points to an urgent need for rigorous research into questions about the relationship between new models of midwifery care and neonatal morbidity.

After examining the visual representations for all seven selected outcome variables the outstanding observable feature that struck me was the incredible variety in the actual rates for the selected outcomes across the whole spectrum of models. For example the rate of epidurals ranged from 11% (Johnson) to 69% (McCourt 2) and the rate of augmentation from 0% (Sandall) to 53% (N Staffs Research Team). Interestingly, in both cases,

both the highest and the lowest rate were recorded for models categorized to have a score of 5 or greater.

It can, however, be seen that, for the studies under examination, the overall trend is for the new, higher scoring models to achieve lower intervention rates than their comparison models for maternal interventions. Nevertheless, this is not universally the case as in a few instances the outcome rates are equal or even higher for lower scoring models in pairs. Interestingly the majority of cases where the standard models have lower or equal outcome rates are in model pairs where both models scored less than 5 for strength. This may be related to the nature of low scoring models being that they have so little strength as models of midwifery that they are closer to a medical than a midwifery model as hypothesised. If this is the case, as clear a relationship with outcome would not be expected for models with lower scores as for models in the higher scores in terms of the elements of midwifery they were categorized to contain.

4.6.2 Visual Representations for Elements of Midwifery Models

A part of the reason for this re-examination of the ensemble of models was to evaluate the potential usefulness of using a classification system to determine the individual contribution of the various elements of midwifery to any differences that are affected by new midwifery models. I therefore prepared visual representations for each of the elements of Partnership, Continuity, Autonomy, Community and Choice in relation to outcome rates. In these visual representations, models were not linked in pairs due to the narrow range of the scores. Each model was represented by an axis. Models were arranged in order of ascending score for the element being represented in a clockwise direction according to convention. The limitation of these representations is recognized as the score ranges are only from 0 to 2 for each element leaving little room for showing subtle variation but leaving much room for misinterpretation. Nevertheless, cautious exploratory examination of the visual representations is warranted as it may reveal interesting clues for further investigation of newly implemented or established models of midwifery and their constituent elements.

The visual representation of each midwifery element separately was undertaken to explore the relationships between individual elements and outcomes. Hints for further refinement of the typology of elements of midwifery and the scoring system may also be suggested by individual exploration of elements. In the interests of simplicity and efficiency I used only Caesarean section, epidural and episiotomy which had shown a potential relationship in the first seven visual representations for relationships between model strengths and outcomes. See Figures 4.8 to 4.12.

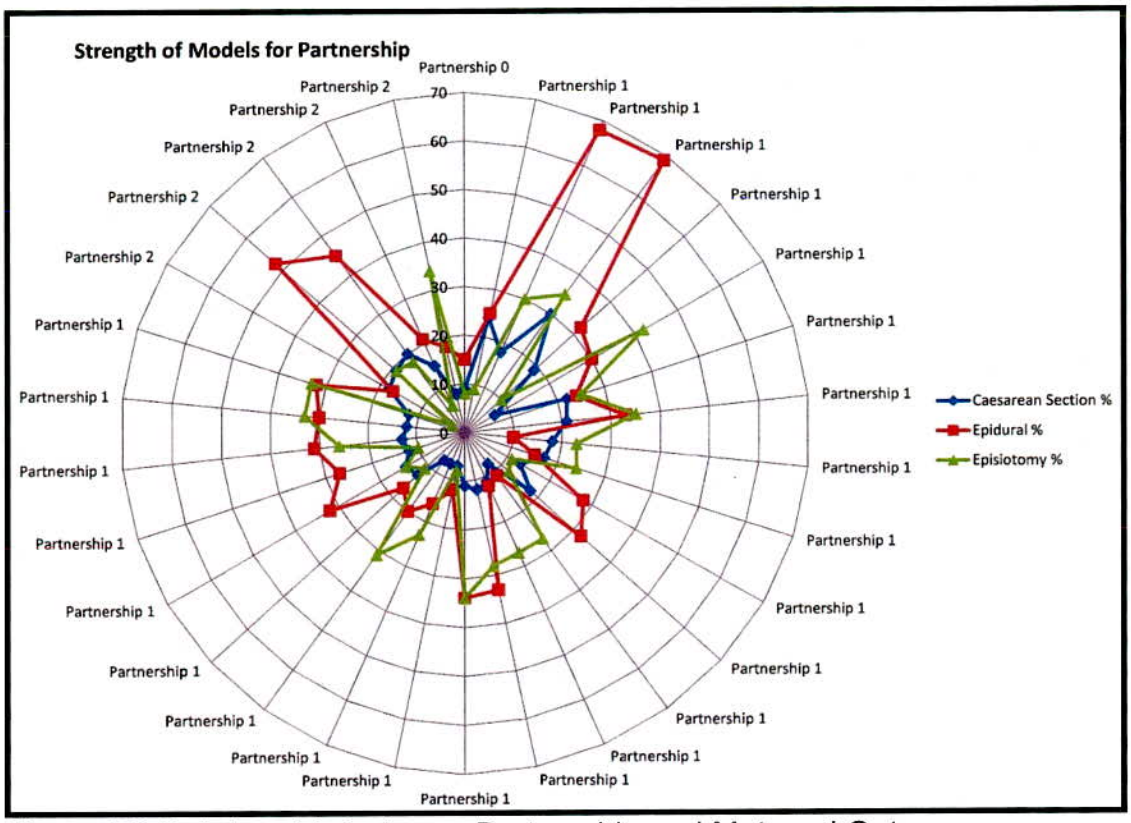

Figure 4.8 Relationship between Partnership and Maternal Outcomes

As only one model (MacVicar) scored zero for Partnership, this visual representation is severely limited. If the zero scoring model was considered an outlier and excluded, a pattern suggesting a relationship between Partnership and the maternal outcomes is suggested. The relationship appears to be present for episiotomy, possibly for epidural and, to lesser extent, for Caesarean section.

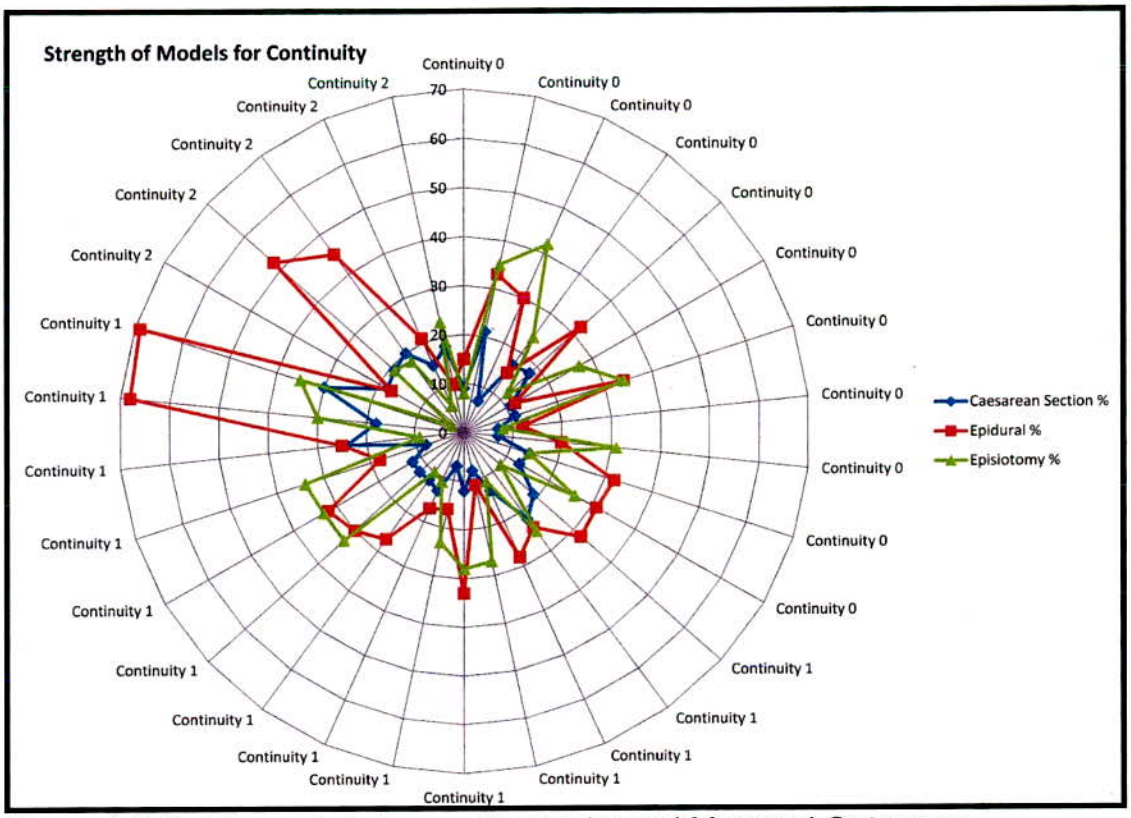

Figure 4.9 Relationship between Continuity and Maternal Outcomes

What is most interesting about this representation of Continuity is that eleven (Flint, Biro, N Staffs Research Team, Homer, Johnson, Turnbull, Waldenstrom[BC], MacVicar, Rowley, Kenny) models scored zero compared with only one that scored zero for Partnership. While it is recognized that this difference between Continuity and Partnership may be an artefact of the complex nature of the link between the two elements or problems with defining them, if the scoring system is accurately measuring Partnership and Continuity, the question arises as to whether the difference is a result of a lack of relationship between these two elements of midwifery. If there truly is little or no relationship it would have considerable implication for researchers who may measure the number of interactions between a midwife and a woman believing it to be a measure of the relationship between them. The more even distribution of Continuity among the models than of Partnership supports the suggestion, noted in the original review of the literature related to models of midwifery, that Continuity may be easier to quantify than Partnership. The visible relationships between outcomes and Continuity are similar to those for Partnership as a relationship between Continuity and

episiotomy is clearly suggested and the potential that a relationship exists between Continuity and epidural is also visible.

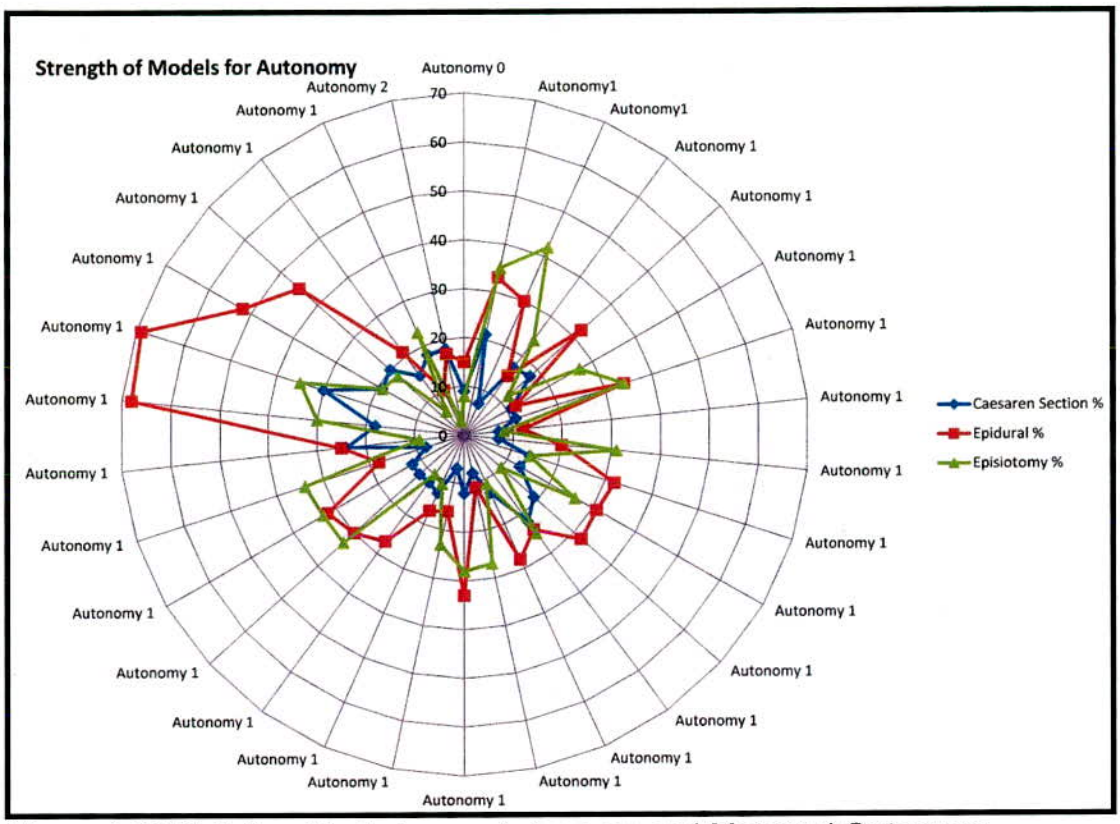

Figure 4.10 Relationship between Autonomy and Maternal Outcomes

The distribution of Autonomy scores among the midwifery models examined is interesting in that all but two models (Sandall, Waldenstrom[BC]) scored one for Autonomy. That the model which scored 0 for Autonomy (Walsdenstrom[BC]) was among the new models with the lowest overall score of 3 and the model which scored 2 for Autonomy (Sandall) was the highest scoring model with an overall score of 10 potentially corroborates the suspicion, expressed in 3.3.1.3, that Autonomy's role in the strength of midwifery models may be more important than it is currently recognized to be. This may support the conjecture discussed in 3.3.1.3 that although midwives throughout the countries represented by these evaluations are theoretically autonomous, in reality their autonomy is greatly undermined by their practice environment. With this distribution it is impossible to extrapolate any patterns.

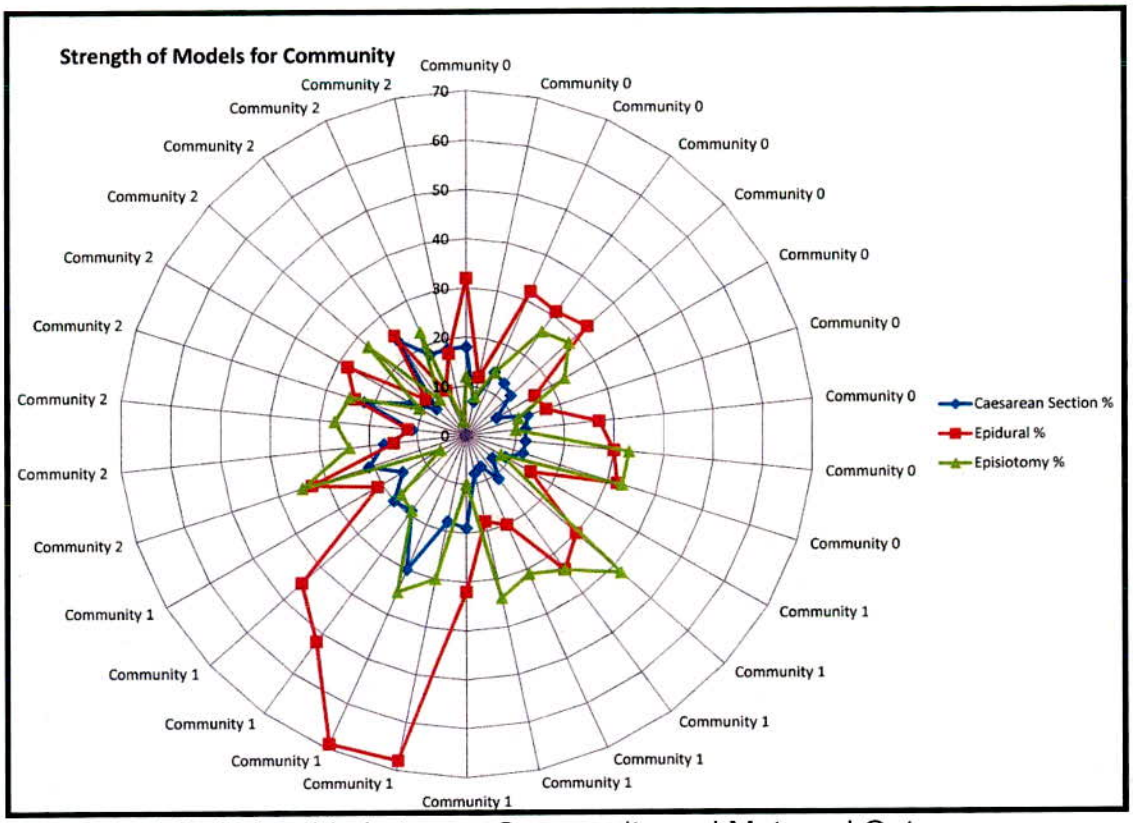

Figure 4.11 Relationship between Community and Maternal Outcomes

Although the distribution of scores is more even for Community, the tendency for more models to score at the midrange is again present and appears to be a consistent trend through the four elements of midwifery visually represented so far. A possible explanation for this potential trend could be related to the process of scoring. Clearly, the limiting of options to 0, 1 and 2 for each element may not provide adequate sensitivity to discern subtle differences in models that were not adequately significant or systemic to be recognized in only three options. Another potential reason for the trend is inadequate or misleading description of models which could also contribute to scoring deficiencies.

The four epidural rates which are above 44% are all from the same evaluation (McCourt 1, McCourt 2) which consisted of primary and follow up studies of the same new model and appear to be an anomaly when considered in relation to other rates which are all 35% or less and stand out as particularly distracting in this representation. As highly significant reductions, by the new model, were found in both cohorts, it is probable that the high epidural rate is a local condition in the institution where epidurals

were available for this evaluation. If these four high outcome rates were eliminated as outliers the lack of any discernable relationship between Community and maternal outcomes would be notable.

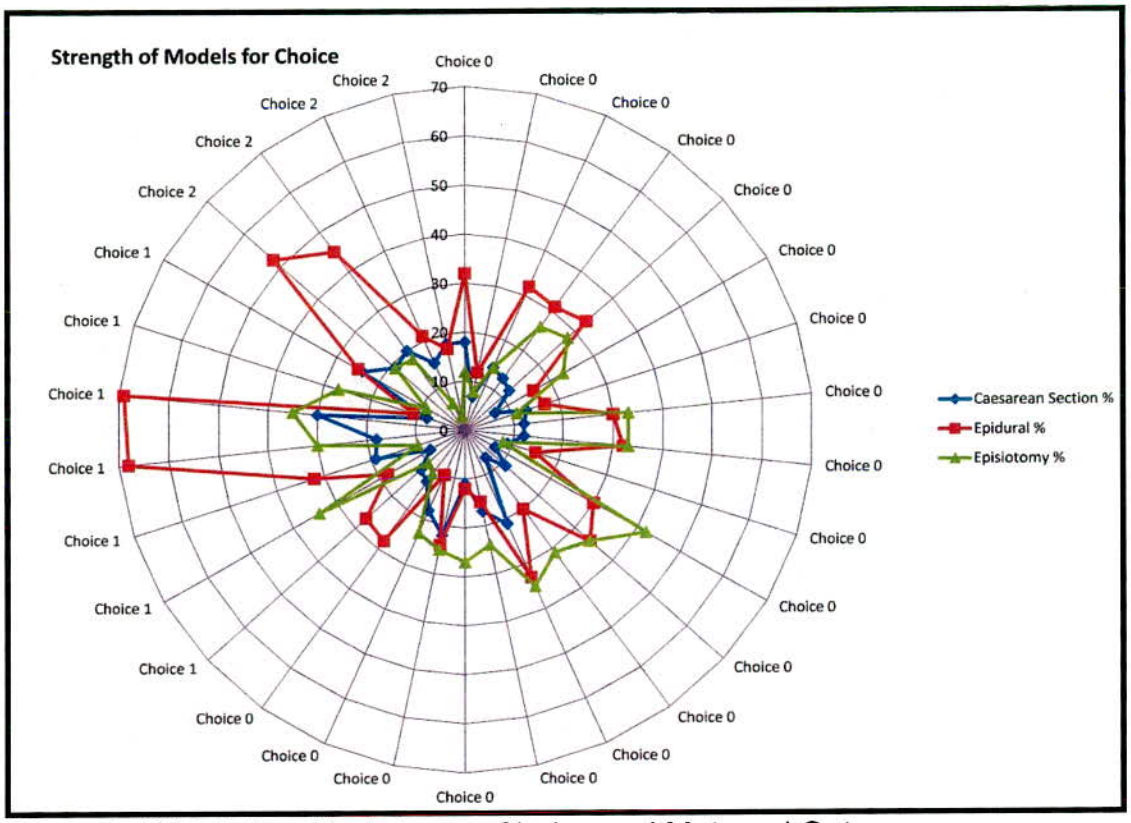

Figure 4.12 Relationship between Choice and Maternal Outcomes

The distribution of scores in the visual representation for Choice is interesting in that, as measured by the classification process, only four models (Sandall, McCourt 1, McCourt 2, Benjamin) scored 2 for Choice while 21 models (Flint, Biro, N Staffs Research Team, Homer, Johnson, Turnbull, Waldenstrom[BC], MacVicar, Rowley, Kenny, Waldenstrom[Team]) scored 0. This distribution supports the inference discussed in relation to the midwifery element of Choice in 3.3.1.5 that although much lip-service is paid to women's right to choice in today's world, the real choice women enjoy may be limited. It also provides a potential that while the scoring system may not be sensitive enough to recognize subtle differences, it may be more effective when differences are clearer.

The presence of the four unusually high epidural rates continues to be distracting but the relationships between Choice and epidural and episiotomy

rates is evident and appears more strongly with Choice than any of the other three elements with which they may possibly be related.

4.6.3 Visual Representations for Other Factors

I began developing another set of visual representations to seek patterns suggesting factors other than midwifery models which might affect outcomes and confound the effects of model elements. To begin, I produced a visual representation for the countries where the studies were conducted. Only established models were included as the aim was to gain information on the standard care available in the countries where the new models were introduced. Countries were arranged in groups on adjacent axes according to convention to facilitate interpretation. The same three maternal outcomes that had been used in the representations for elements of midwifery; Caesarean section, epidural and episiotomy; were used for the same reasons they had been used previously. See Figure 4.13.

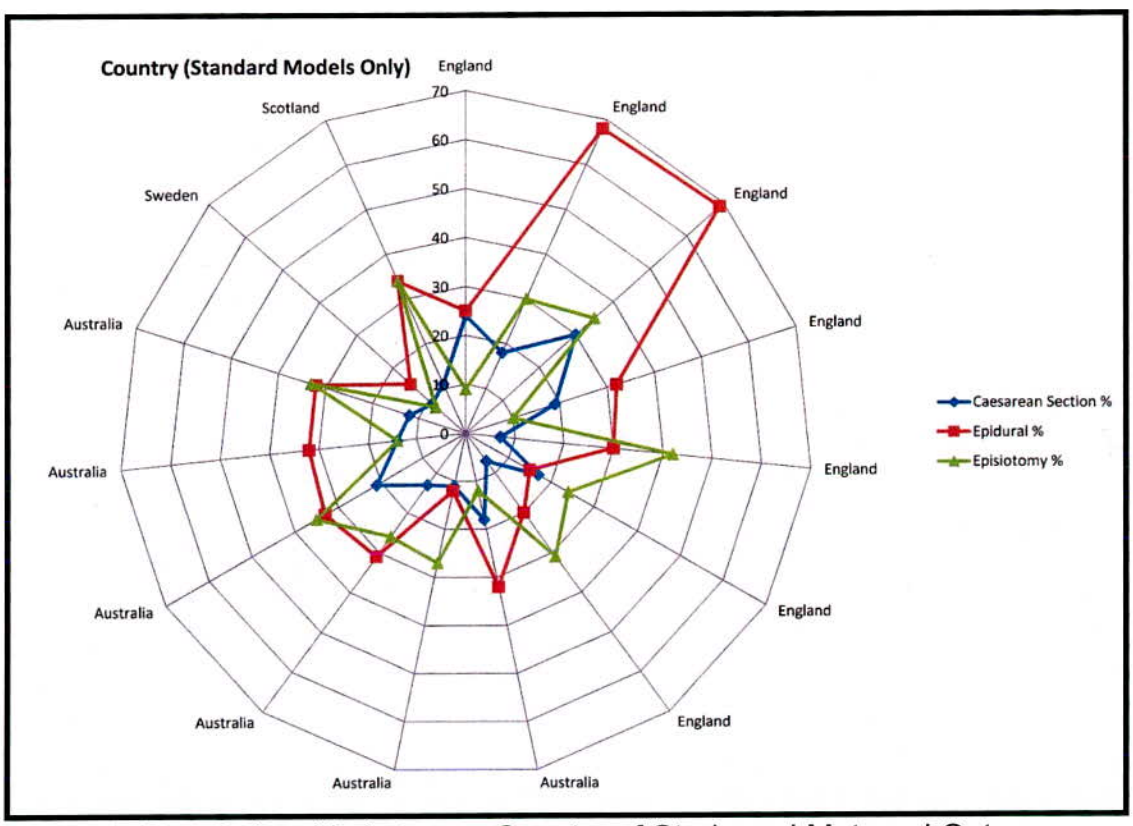

Figure 4.13 Relationship between Country of Study and Maternal Outcomes for Standard Models

From the visual representation no obvious differences between countries was discernable. All countries represented appeared to have a wide distribution of all outcomes across the models represented. Little confidence can be attributed to the relatively low outcomes reported for Sweden (Waldenstrom [BC]) as only one study in a birth centre was carried out in that country.

The similarity of distribution should not be a real surprise as the countries represented are very homogeneous in that they are all resource-rich, developed countries with an established profession of midwifery. The variety of outcome rates within each country, therefore, is most likely a result of local culture, organizational structure and academic and technological resource availability. The presence of high prevalent intervention rates in countries where, unlike in Canada, midwifery is established and formally autonomous supports the suspected undermining of midwives apparent autonomy observed in the Autonomy visual representation and further raises a question of whether, when the dominant culture of practice is a very medicalized one, even midwifery in the newly introduced models is of limited strength in terms of midwifery elements and relatively medicalized.

Secondly, I produced a visual representation for the year the studies were conducted using the same three maternal outcomes. The year during which data collection was completed was used as the index year except for the one study (N Staffs Research Team) where no date was given. In this case two years before publication was used as a proxy since this appeared to be the approximate time line for publication in the studies examined. Years were arranged on axes chronologically in a clockwise direction in keeping with convention. In order to provide a representation of the environments in which the studies were conducted only the standard or traditional models were included in the representation. See Figure 4.14.

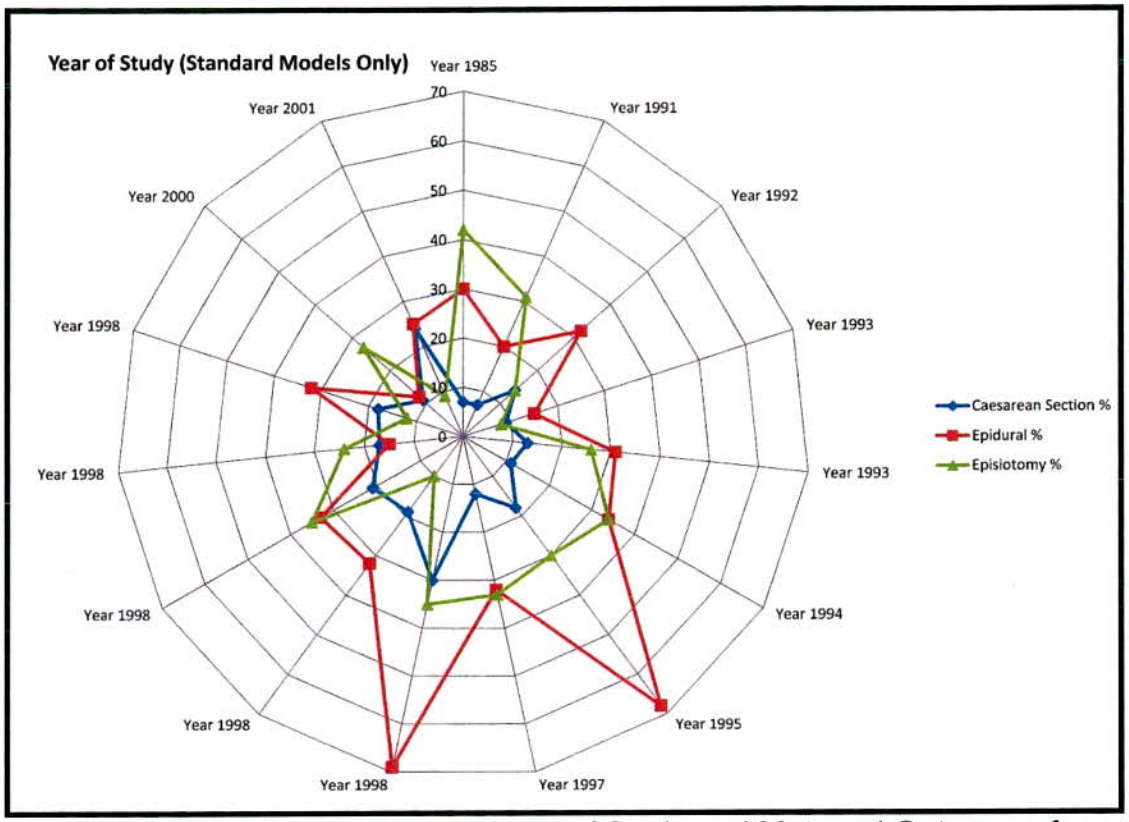

Figure 4.14 Relationship between Year of Study and Maternal Outcomes for Standard Models

Not surprisingly, as the increasing Caesarean rate is a matter of global concern, the representation appears to reflect the increase. It is possible that the apparent drop in episiotomy rates that occurred in the 1980s and early 1990s as a result of increasing evidence on the benefits of selective episiotomy is reflected but as there is only one study prior to 1990 this can only be considered a slight possibility. For the other outcome, epidural, no discernible patterns are evident and a wide range of rates appears to persist over the years.

To further look at the effects of time on outcomes two representations were produced, one for each cohort of the only study (McCourt 1 McCourt 2), of those examined, for which sequential measurements were reported. The study of the first cohort of a newly introduced midwifery model that was categorized as scoring highly for containing elements of midwifery was conducted in 1995 and is represented in Figure 4.15A. The second cohort study, using the same standard and new models, was conducted in 1998 and is represented in the in Figure 4.15B. All seven outcomes of interest were available in usable format for these studies so all were included and

represented as axes of the diagram. The diagrams were produced using the same scale and displayed on the same page to facilitate comparison.,

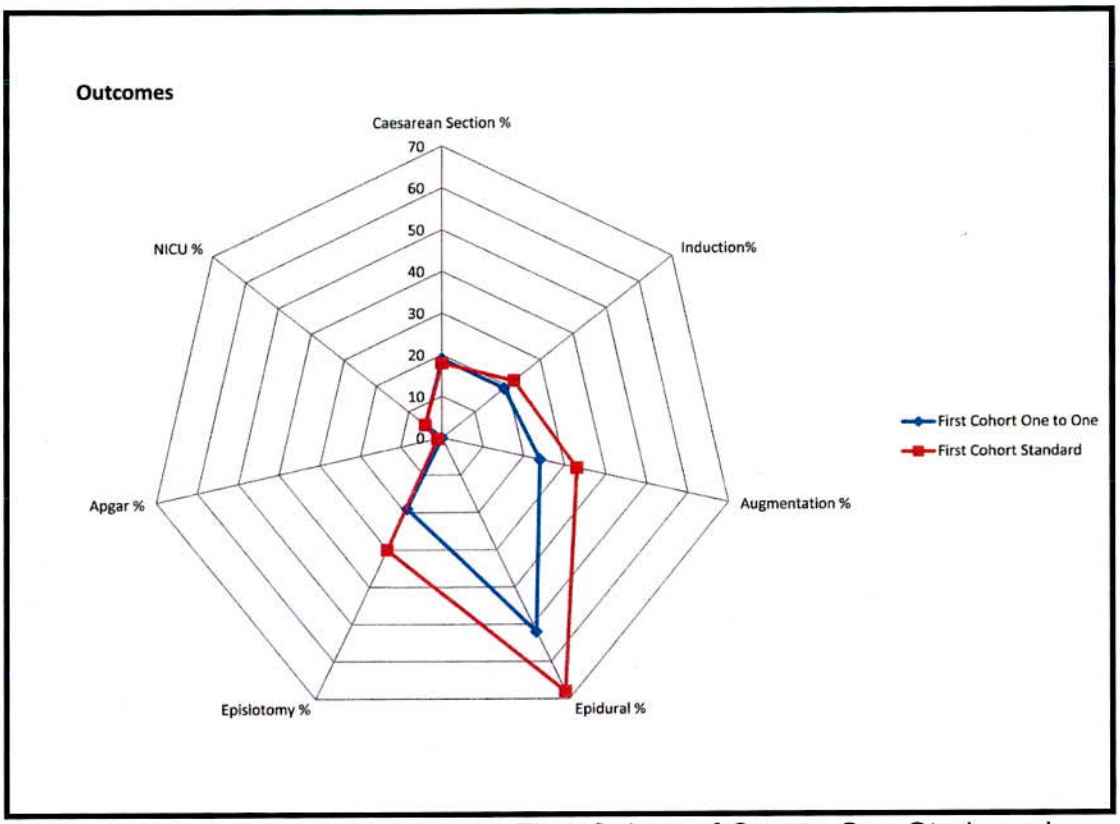

Figure 4.15A Relationship between First Cohort of One-to-One Study and Maternal Outcomes

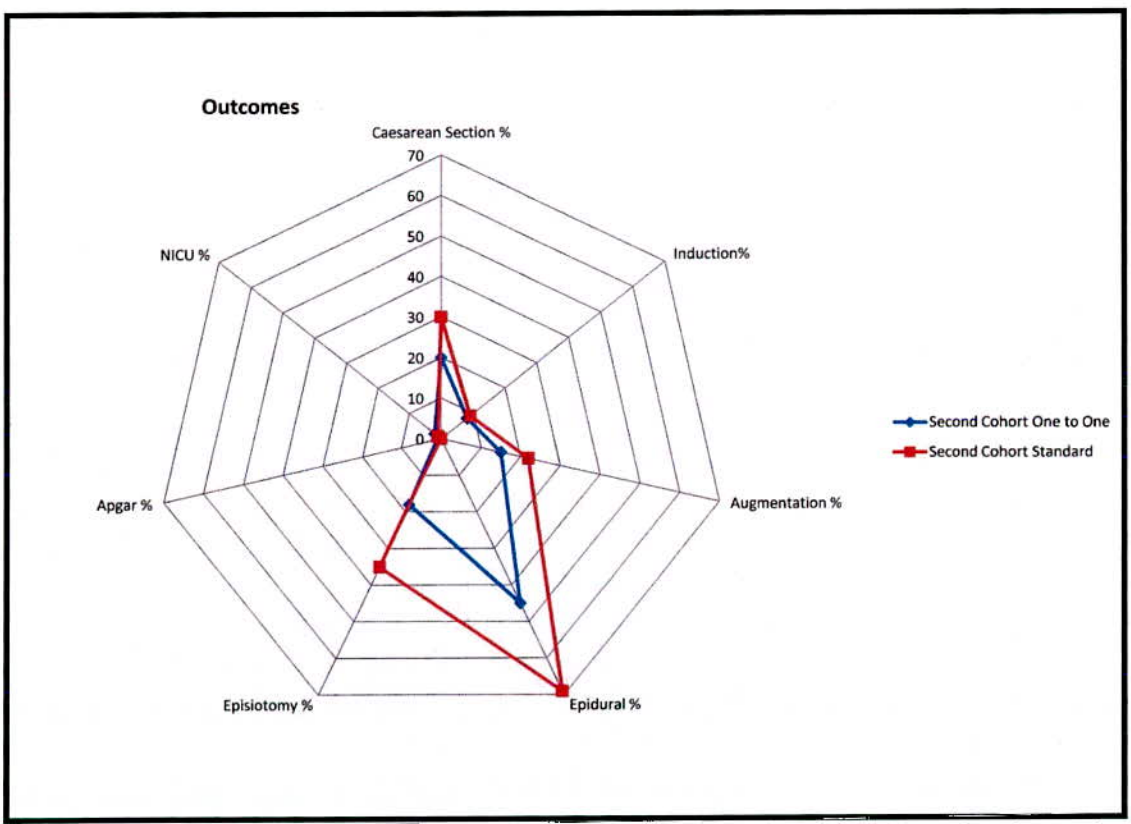

Figure 4.15B Relationship between Second Cohort of One-to-One Study and Maternal Outcomes

While the variations in outcomes for the standard care group make direct comparison of the new model difficult, it can be extrapolated that five of the seven outcome rates are lower for the second cohort new model, while rates for the other two outcomes are unchanged. The absence of higher rates for the new model is consistent regardless of increases or decreases in the standard care model. In light of the observation in the previous representation that changes in outcomes over time occur when other factors cause them to change; considering these two visual representations together leads one to question whether there is a relationship between the amount of time a model categorized as scoring highly for the elements of midwifery has been established and outcome rates. Although rates were not significantly different for the outcomes explored here, significant changes were reported for some outcomes and an overall trend toward increased improvements in outcomes with time was reported (Page et al., 2001).

The final factor for which visual representations were produced was the level of risk of women accepted into care by midwives in the new models of midwifery. As with time two representations were produced using the same scale and displayed on the same page. Models were represented by axes and the three maternal outcomes used previously were used again. Two levels of risk were used for the newly introduced models of midwifery; Low Risk Only where being low risk was a criterion for acceptance into midwifery care and All Risk where level of risk was not a criterion for acceptance into midwifery care. In six of the studies the low risk inclusion criterion was identified and described (Flint, Johnson, Turnbull, Waldenstrom [BC], MacVicar, Waldenstrom [Team]), in six studies it was specifically stated that there were no exclusion criteria on the basis of risk (Sandall, McCourt 1, McCourt 2, Benjamin, Homer N. Staffs,) and in three studies risk was not specifically addressed but was not included in the exclusion or inclusion criteria (Biro,Rowley, Kenny). The studies where risk was not specifically addressed were included in the All Risk category. See Figures 4.16 A and B.

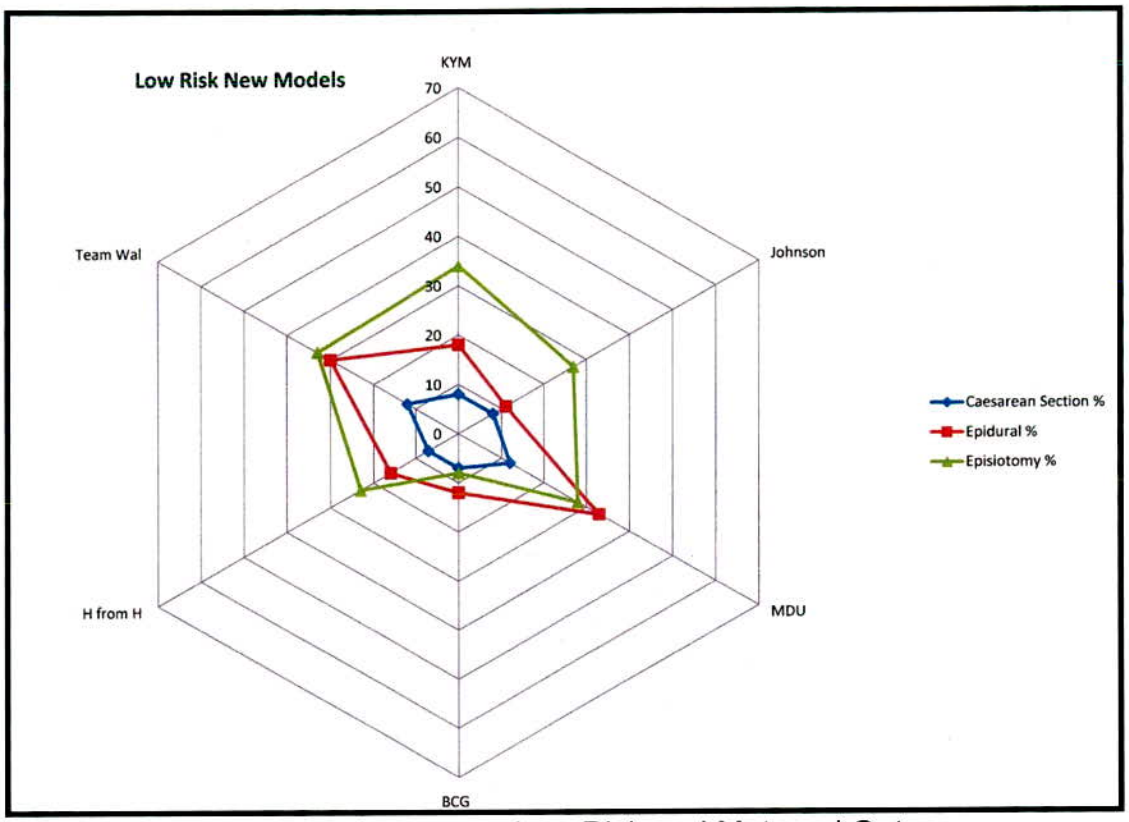

Figure 4.16A Relationship between Low Risk and Maternal Outcomes

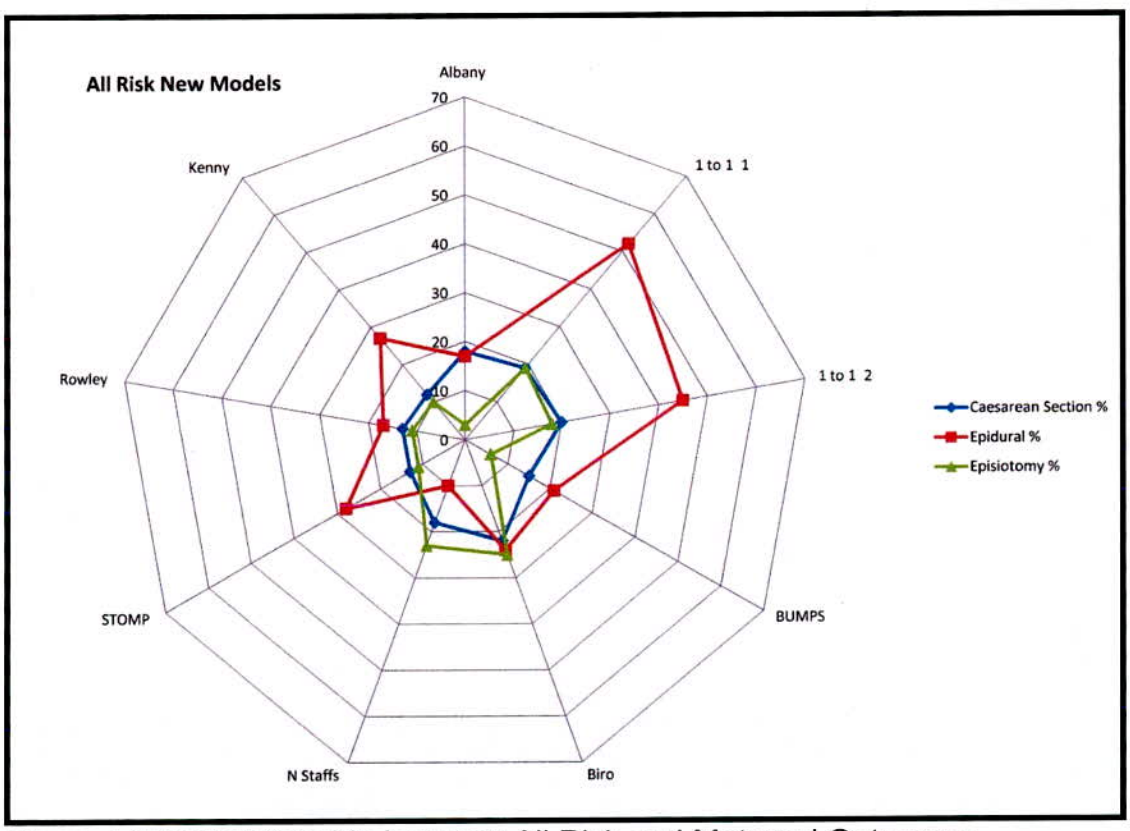

Figure 4.16B Relationship between All Risk and Maternal Outcomes

As expected, there appear to be lower rates of Caesarean Section and epidural for women who were at lower risk of poor outcomes. The reason for the apparent lower rate of episiotomy for women at higher risk is not so readily obvious but is possibly associated with the higher Caesarean section rate as women who have abdominal deliveries are more likely to have intact perinea. It is also possible that intervention rates were generally higher in locations where all risk women were accepted for midwifery care.

4.6.4 Conclusion of the Re-examination of Reviewed Evaluations by Visual Representation

Over the course of preparing the visual representations presented above I began to sense that while strength of model alone did not appear to be clearly related to the rate of outcomes, the difference between the strength of the models being compared might be germane to the relationship. I therefore devised a means of visually representing the difference in strength between the models in each pair and the total difference in outcome rates for each model pair. To achieve this, I calculated the difference in the strength of each model pair by deducting the score of the standard care model from the score of the newly introduced model. I then calculated the total difference in outcome rates by calculating the difference in rates for each of the five maternal outcomes for each pair and summing these differences into an aggregate rate of difference. For the calculation, the differences in rate were considered positive if a lower rate was reported for the new model and negative if a lower rate was reported for the standard model. Neonatal outcomes were again not included due to the number and variety of the measures used or the lack of comparability between studies. Finally I produced a visual representation with the difference in strengths for model pairs in ascending order in a clockwise direction on the axes. The aggregate differences in maternal outcome rates for the model pairs were represented by spiders on the axes. See Figure 4.17.

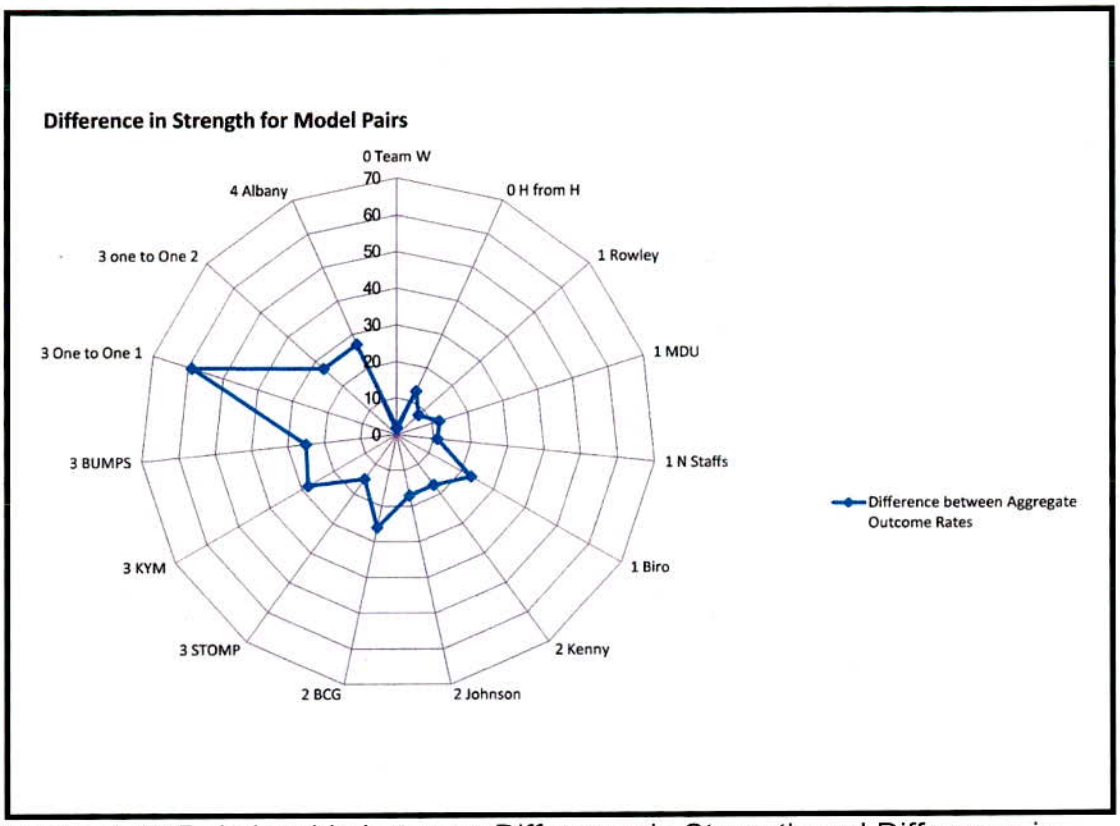

Figure 4.17 Relationship between Difference in Strength and Difference in Aggregate Outcome Rates

Allowing that the process of preparing this representation is somewhat creative, it does suggest that the difference between the strength of a pair of models is positively correlated with the difference in the aggregate rates of maternal outcomes for the evaluation studies re-examined by this process of visual representation. This is a very interesting observation and that it should be the difference between the strengths of the model pairs, rather than the actual strength of the models, that accounts for the differences in outcomes, makes sense in retrospect.

When comparing the difference in outcomes for models in different studies with varying environmental contexts in the earlier visual representations how much effect the situational factors have on the models was clearly unknown. Comparing the difference in outcomes between two models in one study in this final visual representation provides an identical context for the two models of the pair. Therefore the calculated difference between outcome rates may be theorized to be related to the strength of the models and not the result of situational factors and suggests a clear relationship between the

strength of models of midwifery and birth outcomes. Although this potential relationship can be considered little more than a very interesting hypothesis, due to the exploratory nature of the process of identifying it, the hypothesis could be an important source of focus and direction for further research into the effect of elements of midwifery models on outcomes, interventions and processes of midwifery care.

It is disappointing that the data available for neonatal outcomes in the studies reviewed was not suitable to allow for applying the process of visually representing the difference in strength of models and the difference in neonatal outcomes. However, use of the classification system and visual representation, to the degree to which it was possible, highlights the urgent need for research to answer definitively questions which abound in Canada related to the safety of babies whose mothers receive midwifery care, particularly in out-of-hospital birth settings. In fact, this process of re-examining the model evaluation results has shown that, not only for neonatal outcomes, but in research related to the effects of midwifery models in general, improved description and definition of the models and definition and consistent use of outcomes would greatly enhance the interpretation of results.

Although the process of visual representation suggests that the classification system is measuring the strength of models with relative accuracy overall, this did not appear to be the case for individual elements of midwifery care when they were represented separately. Although some patterns seem to confirm, what is hypothesised for elements such as Autonomy and Choice, others showed very little or no pattern at all. This suggests that when clear differences in elements are present the classification system may be able to detect them to some degree but is unable to discern less obvious differences. The process of defining the elements of midwifery and devising a means of determining the strength of midwifery models and their component elements has suggested several possible reasons why this lack of sensitivity is present. Firstly, it is possible that there is just not enough description of models and their components available in the reported evaluations to accurately estimate the strength of elements in midwifery

models. Secondly, it is possible that the 0 to 2 range of scores for each element does not provide enough options to show small or subtle differences between models. Thirdly, it is possible that the elements themselves are not accurate or discrete enough to explain the constituents of midwifery models. A need to revisit the content of the elements is indicated, particularly the possible relationship between partnership and continuity and the roles of accountability, evaluation of practice, and research on effectiveness of midwifery care as elements of midwifery models.

The classification of models also identified that a fundamental difference may exist between midwifery models scoring less than 5 and models scoring 5 or more. The possibility that higher scoring midwifery models may act to buffer the effects of negative factors that contribute to the use of interventions and less desirable outcome rates and that models with lower scores may lack this capability, is very relevant to planners and implementers of new midwifery models. Thus, understanding whether this difference truly exists and the implications if it does could be an important line of future research. Although through this process of classifying models it was identified that some factors other than the model of midwifery may have an effect on birth outcomes, little clarity was achieved regarding the confounding effects of these factors with the exception of case mix for which risk appeared to be clearly related to outcome. Further clarification of how situational factors, such as when and where the study was conducted and how long the model has been in existence is needed to facilitate evaluation of new models of midwifery.

An unexpected discovery from this exercise of using the classification system was the potential usefulness of visual representation as a means of exploring research findings from an ensemble of evaluations of new midwifery models for patterns and trends. The representations provided instant images of the range and distribution of results and were able to show visually where one might expect to find trends or tendencies towards differences. This could be a useful tool for clinicians seeking to interpret evidence and for researchers developing or refining research questions.

Overall the review and exploration of the literature carried out in chapters 3 and 4 have revealed that a considerable amount of work has been done to gain an understanding of what a model of midwifery is and how different models affect the birth experiences of women and babies. Building on this work and using the Alberta model as a starting point, five potential elements of midwifery have been identified and presented as a prototype generic typology. Thirty models of midwifery described in the literature have been classified using the typology and the potential relationship between the elements and birth outcomes, both separately and in combination, have been explored. In addition the potential effect of factors other than the model of midwifery has been explored and several situational factors which may affect birth interventions and outcomes identified. The literature review and exploration suggests that a relationship exists between the degree to which a midwifery model contains the identified elements and birth outcomes of women and it is further suggested that there may be other situational factors which affect birth outcomes and/or mitigate the effects of midwifery models.

In chapters 5 and 6 understanding of the relationship between models of midwifery and birth outcomes is further investigated by the presentation of the research study carried out to evaluate selected outcomes of the Alberta model of midwifery. In chapters 7 and 8 the Alberta model of midwifery and two other models that have been evaluated in western Canada are described and compared. Although it was not possible to include these three models in the review and exploration of the literature as none of them compare a midwifery model with a midwifery model it is possible to compare the three models evaluated with each other. The comparison focuses, in addition to the relationship between midwifery models and outcomes, on the effects of location and birth setting on outcomes when midwifery care is received.

PART TWO: DESCRIPTION OF SELECTED OUTCOMES OF REGULATED MIDWIFERY IN ALBERTA, CANADA

In Part 2 a description of selected outcomes of regulated midwifery in Alberta, Canada is presented. Chapter 5 describes the design and methodology of the Integration of Midwifery Services Evaluation Project, the research that was undertaken to evaluable the integration the newly legalized health discipline of midwifery. An overview of the entire evaluation is presented to provide an understanding of the context in which the research was conducted. A more detailed account is provided of those areas of the evaluation that relate directly to the description of selected outcomes. Chapter 6 presents a full account of the analysis and findings of the Integration of Midwifery Services Evaluation Project, for those outcomes that were selected for description as a part of this study of the relationship between models of midwifery and outcomes.

Chapter 5: Integration of Midwifery Services Evaluation Project (IMSEP) Design and Methodology for Description of Selected Outcomes

As outlined in Chapter 1, if midwifery was to be accepted into Alberta it was essential to demonstrate that it was a legitimate health care discipline that could be integrated into the existing health care services and provide a standard of care that was comparable with services already available without putting an unreasonable burden on the system. In this chapter the design and methodology of the description of selected outcomes of regulated midwifery in Alberta, Canada and its supporting study the Integration of Midwifery Services Evaluation Project (IMSEP) will be addressed. The IMSEP was the primary study conducted to evaluate all aspects of the integration of midwifery into the provincial health care system and the description of selected outcomes evolved from the IMSEP where a more in-depth understanding of how elements of midwifery practice affect selected birth outcomes was sought as a part of this thesis. In the interests of clarity and brevity, only those aspects of the IMSEP that are relevant to the description of selected outcomes are presented in full. The results of the analysis of the IMSEP study that are pertinent to the description of selected outcomes will be presented in Chapter 6. A full account of the IMSEP research is available in the Integration of Midwifery Services Final Report (O'Brien et al., 2004).

5.1. Aims of the Research

A pilot project providing midwifery services by registered midwives practising according to the provincial midwifery regulations was planned to provide a vehicle for rigorous evaluation. The evaluation would provide answers to the many questions about the impact of integrating full scope, independent midwifery into the existing health care system. However, midwives in the province, while anxious to demonstrate that they were a viable health discipline, felt that they had participated in enough pilot and demonstration projects and were not anxious to be part of another one. To comply with the midwives' desire to avoid the use of the words pilot or demonstration, the

title of the Integration of Midwifery Services Project was given to the project in which the first midwives registered in Alberta would practise. The study, which was carried out to evaluate midwifery services and their integration into the existing health care system was titled the Integration of Midwifery Services Evaluation Project (IMSEP).

Having a long history with midwifery in Alberta as a practising midwife, research midwife, midwife educator and active member of the midwifery lobby I was delighted to be asked to be a co-principal investigator for IMSEP. As co-principal I participated in writing of the proposal, securing the funding, collecting data, supervising data analysis and report writing as described in Chapter 1.

5.2 Research Questions

As described in Chapter 1, the IMSEP evaluation was designed to address the issues raised by the Midwifery Fund Allocation Committee, the committee of stakeholders who commissioned the evaluation, each of whom brought a different perspective to the table. In an attempt to include the interests of all committee members in the evaluation proposal six research questions were developed. All six questions are presented in Appendix E. Of the six, the following two questions were the starting point for the description of selected outcomes that is the focus of this thesis:

1. What are the clinical outcomes of women and babies who receive midwifery services?
2. How satisfied are clients and health care providers with their experience of midwife attended birth?

The IMSEP research questions were refined for this thesis to address the specific variables that were of interest to the description of selected outcomes of regulated midwifery care in Alberta as follows:

1. What are the outcomes of selected clinical variables for women and babies that receive midwifery services?
2. How satisfied are women who receive midwifery services?

5.3 Methodology

The IMSEP study aimed to evaluate the integration of midwifery into the existing health care system in accordance with the parameters set out by the committee designated to determine how funds, set aside to support the introduction of the newly regulated profession, would be allocated. The Midwifery Fund Allocation Committee required that the evaluation 1) take place within the five participating health regions, 2) consider women who chose midwifery care and gave birth in one of the five participating regions and 3) include midwives practising in any one of the five regions and wishing to participate in the evaluation.

Evaluation is a research method used widely in health services research and is an appropriate model to answer the research questions identified for the IMSEP evaluation. Health services research is used to investigate the outcome of medical interventions from a number of perspectives and is useful in answering physical, psychological, social, and economic questions (Bowling, 2000). It has been defined as a "scientific inquiry to produce knowledge about the resources, provisions, organization, financing and policies of health services at the population level" (Shi, 1997 p. 15).

A potential disadvantage of health services research is that it is not insulated from the society within which it is situated (Bowling, 2000). It is therefore responsive to current policy and political issues and dependent on decisions taken by others. When funded by governments, the topics to be researched are rarely value free and are prioritized and the results disseminated according to government issues. Government funding for the IMSEP evaluation was a given and recognized as a limitation but the role of the researchers in defining the questions put them in a powerful position to mitigate the government's influence (Sandall et al., 2000).

In addition to being a method of health services research, evaluation may also be conducted from a less scientific approach as a method of quality assurance, audit or needs assessment (Bowling, 2000). The IMSEP investigators experienced some pressure to conduct an evaluation without the more rigorous approach of a research method, from some members of

its steering committee, who felt that a quality assurance approach would be quicker and less costly, allowing for a larger sample of women to be studied. While recognizing the truth of this opinion, the researchers felt that the advantages of evaluation as formal research, based in a process of scientific inquiry, outweighed the advantages of a quicker, cheaper method. Evaluation methodology has to be rigorous to provide convincing information (Chen, 2005) and a research-based evaluation would be more credible to peer reviewers and more likely to carry weight with policy makers and financers of midwifery services in the future. The researchers therefore made this case to the steering committee and won their support for designing an evaluation with a research approach.

There are many methods of health services research available to researchers when it comes to designing a particular study (Shi, 1997). Each approach has strengths and weaknesses that determine its suitability for a given problem (Shi, 1997). The classic, experimental design, in the form of a randomized controlled trial (RCT), is generally accepted to be the ideal foundation on which to conduct scientific research and is the design against which others are judged (McKee et al., 1998, Fink, 1993). Experimental design, because it reflects the direction of influence and controls for extraneous variables, is high in internal validity and provides relatively accurate inferences about cause and effect (Shi, 1997). The major advantage of a randomized controlled trial is that it is widely recognized as providing credible evidence of an intervention's effect (Chen, 2005). The RCT is designed to show the effect of one intervention and not all variables that may produce or moderate the same effect. Consequently, generalizability is limited as it cannot be known if the intervention will work in other settings (Shi, 1997). The benefit of credibility was considered important enough to outweigh the disadvantage of the experimental design inherent in its lack of external validity.

Randomized controlled trial was judged by the researchers to be the best choice for the evaluation of IMSEP, particularly in view of the scepticism which had been evident in Alberta related to the credibility of midwifery as an effective and affordable profession. As the experimental design had been

used previously by the author of this thesis in an RCT to study midwifery in the province, the desire to use it again was strong even though midwifery researchers have suggested that there is a need to avoid seeing research as only useful if it relates to clinical outcomes demonstrated through RCTs (Rees, 2003). Although clinical outcomes are a primary concern, the midwifery profession needs to take account of other aspects of care, and employ other legitimate forms of research evidence that may more aptly inform some decisions about midwifery services. Clinical outcomes were a primary concern for the IMSEP evaluation but, in fact, the majority of questions related to organizational, professional, economic and social matters for which an observational research approach would be more suitable than the approach of an experimental design (Johnson et al., 2007). Furthermore, the IMSEP evaluation researchers were aware that many authors have cautioned that experimental design may be logistically or ethically difficult and not always feasible and that the use of other research designs may have to be considered (Shi, 1997, Bowling, 2000, Chen, 2005, Fink, 1993, Cluett, 2000).

The registration of midwives prior to the implementation of IMSEP made it ethically impossible to conduct a randomized controlled trial. When the previous RCT had been conducted there had been a serendipitous window of opportunity to treat midwifery as an experimental treatment due to its lack of legal recognition. In addition, the demand for inclusion in the hospital pilot programme studied was considerably larger than the supply and for every woman accepted for care at least one was denied care. In the RCT, the only difference was that denial of midwifery care was randomly assigned. Thus, ethical requirements were met. The recognition of midwifery as a health profession legitimized midwifery as a health discipline and prevented it from ethically being considered an experimental treatment. Further, the RCT was ruled out because it violates the concept of choice inherent in the model of midwifery. In addition, the multisite nature of the evaluation made it unfeasible to identify and collect data for a physician group. As a randomized control group was not a possibility, a prospective, cohort study of the first 150 women to receive care from registered midwives was selected as a

practical and appropriate design for beginning to build knowledge about the processes and outcomes of integrated midwifery services in Alberta (Black et al., 1998).

When designing a prospective study researchers can select from a wide range of qualitative and quantitative methods. In general, quantitative research seeks to test a theory to support or refute it while qualitative research seeks to understand the meaning individuals give to a phenomenon (Creswell and Plano Clark, 2007). Traditionally, it has been claimed that quantitative methods are used to collect hard data and qualitative methods to collect soft data with hard data being the ideal and soft data only of little value (Quinn Patton, 1997). In more recent years, combining these methods in mixed methods designs has been gaining acceptance as a way of overcoming the dichotomy between qualitative and quantitative methods (Donovan, 2000). In an attempt to gain a clear understanding of how mixed methods research is currently understood leading methodologists (Johnson et al., 2007) asked 36 leaders in the field to share their current definitions of mixed methods research. Based on the resulting 19 definitions they concluded that mixed methods research is a third methodological paradigm along with the two traditional paradigms of qualitative and quantitative methods. Mixed methods research now provides researchers with a rigorous approach to answering their research questions (Donovan, 2000) and a mixed method design was selected as the best approach for the IMSEP evaluation. Mixed methods research is more practically defined as:

> ...a research design with philosophical assumptions as well as methods of inquiry. As a methodology it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on the collecting, analysing, and mixing of both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone. (Creswell and Plano Clark, 2007 p. 7)

By using a mixed methods approach for the IMSEP evaluation a better understanding of the integration of midwifery services would be gained than by using either qualitative or quantitative methods alone as mixed methods provide strengths that offset the weaknesses of both (Creswell and Plano Clark, 2007). Using mixed methods provides a practical way to collect multiple forms of data from diverse audiences and address the complexities of problems associated with integrating midwives.

Once the decision was made to use a mixed methods approach the next step was to select a specific design that would best address the research questions. Recently, selecting a specific design for a mixed methods research study has been much simplified by Creswell and Plano Clark (2007) who, after searching the literature and identifying 40 mixed methods designs, classified them into four major types. The most common and well-known type of mixed methods design that they identified was triangulation. The purpose of triangulation is "to obtain different but complementary data on the same topic" (Morse, 1991 p.122) to gain the best possible understanding of a problem. Triangulation was the strategy selected to study the integration of midwifery with the quantitative and qualitative data handled separately during concurrent collection and analysis but considered by convergence, simultaneously and with equal weight, when describing and explaining the findings (Morse, 1991) to produce valid and well substantiated conclusions (Creswell and Plano Clark, 2007). Members of the research team had expertise in both qualitative and quantitative research and adequate resources available to enable the apportioning of equal weight to both methods and avoiding a potential weakness in the triangulation approach (Morse, 1991).

Once a triangulation strategy with a convergence variant had been selected for the IMSEP, plans for collecting the data were commenced. As health care in Alberta is funded by the provincial government, with the exception of fees for the services of a midwife, the government is the only source of costing data. During discussions between the researchers and provincial statistical analysts, a potential to retrieve data regarding health outcomes as well as costing outcomes for IMSEP participants was identified. The potential

of accessing data for other mother infant dyads in the province was also revealed. As a randomly assigned control group was not possible the idea of using a non-randomized comparison group, accessed through provincial health records, was exciting to the researchers as non-equivalent comparison group designs are often used when random assignment of individual subjects is not possible (Shi, 1997) as they are generally more practical, feasible and realistic than RCTs (Sandall et al., 2000). At this suggestion, the provincial officers volunteered to match a group of women who had given birth in the health regions where IMSEP was being conducted with the IMSEP participants on predetermined variables. The government officers would be unbiased and would strip all identifying information from the records before turning them over to the researchers to ensure confidentiality. The design for IMSEP therefore was revised and a matched comparison group, for those variables which would be available through the provincial government, was added. Adding a comparison group greatly strengthened the design of the evaluation (Payne and Payne, 2004), even though the assignment to the group was not random.

5.4 Design

The IMSEP was carried out in three distinct but concurrent parts. The first part was a descriptive design to study a volunteer cohort of women who received midwifery care from registered midwives and who were followed prospectively from their first prenatal visit with their midwife until six months after the birth of their baby.

The second part was a comparison design using the provincial records of the 146 women in the volunteer cohort compared with the records of a group of 292 women who gave birth during the study period but received maternity care from non-midwife health care providers. Each study participant was matched with two controls for antepartum risk score, maternal age, parity and geographic location by provincial officers as instructed by the researchers. Antepartum risk score was estimated using the Alberta Provincial Government Risk Assessment Form details of which are provided in Appendix F.

The third part was a qualitative design with analysis of the transcripts of 12 focus groups and 6 individual interviews of stakeholders in the integration of midwifery. Participants in the focus groups and interviews were women from the volunteer cohort who experienced midwifery care, midwives who had provided care and other health professionals who had interacted with midwives during the study period. Data from this part of IMSEP have been reported separately (O'Brien et al., 2004) and do not form part of the ROMM analysis.

The description of selected outcomes was carried out once all IMSEP data were collected and analysed. Using SPSS (Version 13), I reanalysed the quantitative data from the volunteer cohort and the comparison group from the IMSEP study focusing on those variables which had been selected for further study. The purpose of the reanalysis was to confirm the accuracy of the original analysis, reinforce my familiarity with the data and analyse data that had not been included in the IMSEP analysis. As described in Chapter 4, the variables of interest consisted of seven maternal and three newborn clinical outcomes and maternal satisfaction which are presented in Table 5.1.

Outcome Variables
MATERNAL OUTCOMES
Type of Birth
Labour Stimulation
Perineal Integrity
Epidural
Antepartum ultrasound
Intravenous in labour
Length of hospital stay
NEONATAL OUTCOMES
Admission to NICU
Apgar Score
Birth Weight
SATISFACTION
Various satisfaction and related outcomes

Table 5.1

In addition to the clinical outcomes, five demographic and four pregnancy-related characteristics, presented in Table 5.2 were included as they potentially may influence clinical outcomes.

Demographic and Pregnancy Related Characteristics
DEMOGRAPHIC
Age
Annual Family Income
Ethnicity
Marital Status
Maternal Education
PREGNANCY RELATED
Birth Location
Spontaneous Abortion
Parity
Risk Factors

Table 5.2

Results for the description of selected outcomes consisted of the presentation of those outcomes as collected prospectively for the volunteer cohort who received midwifery care from Part 1 of the IMSEP. If data were not available from the prospective data, retrospectively collected provincial records data from Part 2 of IMSEP was substituted, if it were available. Since care by physicians was not of interest to the description of selected outcomes, data for the comparison group collected in Part 2 of IMSEP are only presented as contextual information to the study cohort data when and if appropriate in this thesis. Where retrospective data have been substituted or used to augment the prospective data it is clearly indicated as provincial data and presented [*bracketed and italicised*] to avoid the potential for inadvertent comparison of the different data sets. Likewise, qualitative data from Part 3 of IMSEP was not included in the description of selected outcomes except where it might add depth to the discussion. Where qualitative data have been used they are clearly identified as supplemental data.

5.5 Organization

The Midwifery Fund Allocation Committee was reorganized and expanded as the Midwifery Project Steering Committee to oversee the activities of the IMSEP research team. The Committee met as needed to receive progress reports from the investigators and provide advice and support.

Alberta is a large province of 661,848 sq. km (Natural Resources Canada, 2001) and a population of only 3,290,350 (Statistics Canada, 2006).

Compared with the United Kingdom, which is 243,820 sq km (Wikipedia, 2007) with a population of 59,037,758 (Wikipedia, 2001), Alberta is three times as large as the United Kingdom with only one twentieth of the population. The majority of Alberta's population lives in two cities with populations of just under a million each, while the remainder are scattered throughout the rest of the province. At the time when IMSEP was planned and conducted the province was divided into 17 health regions each administered by a Regional Health Authority which provided health care funded through a provincial health insurance plan. Regions were based on population rather than area so there was one region for each of the cities and fifteen others, some of which consisted of large tracts of tundra, prairie or mountains and were very scarcely populated. A map of the province identifying the health regions is provided in Appendix G. At the time that the IMSEP proposal was written there were a total of 21 midwives practising in 5 of the regions. The majority were in the two cities and these regions were labelled Urban Region 1 and Urban Region 2. The remaining midwives were unevenly distributed between three of the other regions which were labelled Rural Regions 1, 2 and 3.

All meetings of the Midwifery Project Steering Committee were held at a central location in Rural Region 1 except for the January 24, 2002 meeting, which was held in Urban Region 1 and the April 21, 2001 meeting which was a teleconference. Rural Region 3 was ultimately unable to participate in the study as the one practising midwife in the health region left the country before the project commenced and the representative withdrew. The committee met a total of ten times including the teleconference. The Evaluation of IMSEP was conducted by a research team as shown in Table 5.3 and was administered through the University of Alberta.

Midwifery Project Research Team	
Position	**Name**
Co-Principal Investigators	Beverly O'Brien, RM; Sheila Harvey, RM
Co-Investigators	Susan Bischel - Nurse James Smythe - Economist:
Project Director	Susan Sommerfeldt
Research Assistants	Rosalie Zimmer, Kim Van Sickle, Julia Hews
Statisticians	Gian Jhangri, William Midodzi

Table 5.3

Alberta Health and Wellness, a department within the provincial government, awarded the grant for IMSEP on April 26, 1999, but the project was not able to commence until January 1, 2001. The delay in starting the study was incurred by the need to develop the infrastructure to allow midwives access to all the resources necessary for practice. During the period between the awarding of the grant and the commencement of the evaluation several major events occurred. Legislation was changed to enable prescribing rights for midwives and to enable hospitals to grant admitting privileges to midwives. Midwives applied for and were granted admitting privileges to hospitals within all the participating health regions. A new mechanism was developed and implemented for compensating physicians who provided consultation to midwives.

5.5.1. Ethical Approval

The proposal was submitted to the Health Review Ethics Board at the University of Alberta located in Urban Region 1 and the Biomedical Ethics Committee at the University of Calgary in Urban Region 2 and approved by both. To meet the separate criteria required by the ethics committees, it was necessary to use slightly different wording for the information sheets and consent forms that were presented to participants in the two regions. The two rural regions gave ethical approval of the study based on the approval received from the two larger regions with Rural Region 1 adopting the information sheet and consent form of Urban Region 1 and Rural Region 2 adopting the information sheet and consent form of Urban Region 2. A separate submission for ethical approval was made to the provincial

government as provincial health records were to be accessed. An additional information sheet and consent form was developed to fulfil governmental requirements for the retrieval of data from its data bases. Ethical approval was also subsequently granted by the legal department of the provincial government. All information letters and consent forms are presented in Appendix H.

5.5.2 Audit

A telephone audit of study participants was conducted between April 2001 and August 2001. The audit was undertaken because some participants contacted the Alberta Health and Wellness with comments regarding various concerns. The concerns were 1) being personally billed for midwifery services, 2) being requested to purchase a book for a significantly inflated price, and 3) seeing someone other than their midwife at some prenatal visits. Four protocol deviations were identified by the audit and rectified. The audit report is presented in Appendix I.

5.6 Methods and Process

5.6.1 Sample

5.6.1.1 Volunteer Cohort

Although midwifery services are not publicly funded in Alberta, midwifery services for women in IMSEP were covered by the research grant and provided at no cost to the clients. Publicly funded laboratory tests and diagnostic screening; maternal child community support, including the care provided by community health nurses, family physicians, and other public health service providers, were also available to the midwives' clients.

Participating midwives were paid from the grant at intervals while providing services to a particular client. The payments were made at 20 and 36 weeks gestation and 4 weeks following the birth. The amounts paid were $500.00, $980.00, and $500.00 respectively for a total of $1,980.00 per client. Midwives agreed to participate for this fee despite the fact that, due to the long delay between the funding of the proposal and the commencement of the evaluation, while the infrastructure to allow midwives access to all the

resources necessary for practice was developed, midwifery fees had risen to $2,500.00.

Eligibility to participate in IMSEP was dependent on a pregnant woman being less than 20 weeks gestation at the commencement of midwifery care, at low risk for complications of pregnancy and birth and maintaining a low risk status throughout the course of care. Analysis was by intention to treat for women for whom increased risk necessitated shared or transferred care.

5.6.1.2 Comparison Sample

A comparison group was selected from the population of 19,676 women who gave birth in one of the four participating health regions during the study period. As the sample size of the study group was limited by available research grant funding a two to one matching process was used which gives only a slightly decreased power than using a larger study sample and equal sample sizes (Torgerson and Campbell, 2000). Two matched controls for each study participant would also ensure adequate power to find true between-group differences when the population of the matched sample was so much larger than the study sample (Selvin, 2004).

Criteria for which controls were matched are presented in Figure 5.1

Matching Criteria for Study Group and Controls
antenatal risk score
age
parity
geographic location
date of birth

Figure 5.1

Controls were matched to each study participant based on exact antenatal risk scores assigned at the first prenatal visit. A further match was made based on maternal age within 5 years. The third match was with respect to parity. The fourth match was by postal code. Postal code was included because it reflects geographic location and is moderately correlated with socio-economic status. If two matched controls were not found within the

same postal code as a given participant, adjoining postal codes were used. Finally, each member of the control group gave birth within 3 months of the participant with whom she was matched. The potential for selection bias exists since controls were not randomly selected but is reduced in that matches were made by a neutral officer of the provincial government and usually not more than 2 choices were available by the time all matching criteria were taken into account.

There were no between-group differences with respect to risk score, maternal age or postal code. The percentages of women who were nulliparous and multiparous were similar between groups with 29% of women in the study group and 34% of women in the control group being nulliparous or expecting their first viable baby. Whether a woman has previously given birth to a viable baby is the generally accepted measure of parity used in research in Canada due to the increased clinical risk associated with the birth of a first baby compared to subsequent births. Therefore the groups were considered as similar for parity despite the average number of live births being 1.9 for the study group versus 3 for the matched group (t—6.3, 355.4 DF, $p<0.0001$. 2-tailed) due to an error which was made by Alberta Health during the matching process.

5.6.2 Data Collection

5.6.2.1 Quantitative Data

A set of survey questionnaires was provided for each of the 146 midwifery clients who were participants in the study. Participants completed some of the set of questionnaires so that complex and abstract variables that reflect perception of the quality of midwifery services could be evaluated. The remainder of the set of questionnaires were completed by midwives and other health care professionals and included measures of observable demographic and clinical outcomes. A research assistant administered a final telephone questionnaire at 6 months after the birth so that breastfeeding patterns could be assessed. All questionnaires are presented in Appendix J.

5.6.2.1.1 Participant Questionnaires

5.6.2.1.1.1 The Client's Experience and Satisfaction Questionnaire (CESQ)

It is well accepted that it is important to ask women what they think about, or, in other words how satisfied they are with, the maternity care they receive (Proctor, 1998, Proctor, 1999, Young, 1998). In Canada, client satisfaction with midwifery care is considered a critical variable in the evaluation of maternity care (Weatherston, 1985) even though the complex, deceptively simple and multidimensional nature of satisfaction makes it extremely difficult to assess (Bramadat and Driedger, 1993, Lumley, 1985, Shearer, 1987, Shearer, 1989, Johnson et al., 2002, Proctor, 1999, Young, 1998). The difficulty is compounded by the relationship of satisfaction to both process and outcome. Satisfaction is often used in research as a surrogate for the even more complex and less understood overall experience of childbirth (Larkin et al., In Press).

Many difficulties with measuring satisfaction have been identified, not least of which is understanding what satisfaction with childbirth means (Shearer, 1989) however, after reviewing the research and other literature scholars have concluded that enough is known about satisfaction with child birth to accept that such a thing exists as a feeling that results after a positive evaluation of an experience (Bramadat and Driedger, 1993, Lumley, 1985). Satisfaction "is not just an emotional response but an evaluation of an emotion" (Bramadat and Driedger, 1993 p. 22). Another methodological difficulty inherent in measuring satisfaction with maternity care is the potential for other outcomes to influence psychological outcomes such as satisfaction, as much as experience (Green et al., 1990). These may include a woman's overall mood, how the question is posed, who asks the question and how much time has passed since the event occurred (Shearer, 1989). In addition women may be reluctant to criticize caregivers upon whom the safe birth of their baby may depend (Sullivan and Beeman, 1982, Shearer, 1989).

As researchers in Canada, our preference was to use a Canadian tool to measure satisfaction and we seriously considered using the Canadian

developed Labour and Delivery Satisfaction Index (LADSI) (Lomas et al., 1987) that had been used with confidence in Alberta (Harvey et al., 2002), shortly after its development. However, we were dissuaded by the fact that it had rarely been used since by other Canadian researchers and a convincing critique that showed LADSI to be limited by several of the issues identified in the literature as problems in designing an instrument to measure satisfaction (Shearer, 1987). The limitations included non-representative items, low internal consistency and a possible lack of sensitivity leading to a suggestion that LADSI may, in fact, be a "weak measurement of mood rather than of satisfaction" (Shearer, 1987 p. 131).

At the time we were seeking suitable tools for measuring outcomes of midwifery, such tools were limited, although much progress has been made since then (Aikins Murphy and Fullerton, 2006, Devane et al., 2007, Wiegers et al., 1996, Janssen et al., 2006b, Johnson et al., 2002). Some work had been done on measuring patients' satisfaction with nursing care in hospitals (Field, 1987, Monica et al., 1986) but it did not transfer to community based midwifery. Our colleagues in British Columbia, with whom we were in communication, were also developing a research proposal to evaluate midwifery in a study with a control group of women who received care from midwives and, at the commencement of labour, intended to give birth at home. Two groups of women intending to give birth in hospital, one group cared for by midwives and one group cared for by physicians and nurses, were to be studied as comparison groups. The British Columbia researchers had experienced the same difficulty in finding a suitable tool to measure satisfaction as we had. As a result, they had recently developed a tool to measure outcomes of midwifery care for their research that included a measure of maternal satisfaction that they were willing to share (Gale, 1997). As we had no mandate or funds to develop our own tool, we decided to use the British Columbia developed tool, Client Experience and Satisfaction Questionnaire (CESQ), as it was locally developed and would potentially provide an opportunity to create an expanded database in the future.

The experience section of CESQ has 6 demographic questions related to where birth occurred and who provided various aspects of care. A further

five questions are related to satisfaction and seek women's responses to questions about the information received and availability of caregivers as women's response to aspects of care is recognized as a fruitful measure of satisfaction (Shearer, 1990). A final question asked about overall satisfaction with the childbirth experience. Although recent research has suggested that because of its multidimensional nature an overall measure of satisfaction may be misleading and that the scores of individual items may be more revealing, further analysis has shown overall satisfaction to be a sensitive measure of satisfaction when the overall measure is placed at the end of a questionnaire composed of questions related to individual items (Green et al., 1990). The responses for the satisfaction questions were designed in Likert format with 1 equalling never and 5 equalling always. A space inviting comments on aspects of pregnancy care was also included.

Validity and reliability of the CESQ had not been reported prior to IMSEP and no report of testing in British Columbia was available at the time the IMSEP data were analysed. Consequently, comparison with the second measure of satisfaction used in the IMSEP study was used to establish validity. Women's perception of their control in labour as measured by the Labour Agentry Scale (LAS), which is described in the next section, was used as an indirect measure of satisfaction in IMSEP, as control and satisfaction have been found to be correlated (Humenick and Bugen, 1981). Construct validity of the CESQ was supported by the correlation between the overall satisfaction question score with the total score for the LAS both of which were administered in the postpartum period during the IMSEP study ($r = 0.63$, $p < 0.0001$). The CESQ questionnaire was completed and returned by mail by 144/146 participants as soon as possible after the last visit with their midwives.

5.6.2.1.1.2 The Labour Agentry Scale (LAS)

The childbirth literature suggests that being in control of the situation during birth is associated with a more positive experience (Green et al., 1990). In 1981, building on the work of previous childbirth education researchers, who reported that the major factor associated with a positive birth experience was

a woman's perception of control in childbirth (Davenport-Slack and Boylan, 1974, Goodwin, 1970, Huttle et al., 1972, Willmuth, 1975, Willmuth et al., 1978), Humenick (1981) proposed a model of control in childbirth entitled 'Mastery: The Key to Childbirth Satisfaction'. She defined mastery as feeling in control of the task of giving birth, actively participating in decision making and not surrendering responsibility for decision making to care providers (Humenick, 1981). To test the mastery model two scales, Labour Agency and Delivery Agency, for rating levels of mastery were adapted from an instrument developed by Oliver (Oliver, 1972) to measure control during childbirth and mastery was found to explain satisfaction in a sample of 33 women (Humenick and Bugen, 1981). This finding that control or mastery is a predictor of satisfaction and associated emotional well-being has frequently been confirmed by research (Simkin, 1991, Humenick, 1994, Gibbons and Thomson, 2001, Goodman et al., 2004, Kelly et al., 1999-2001, Bandura, 1977, Bramadat, 1990, Brown and Lumley, 1994, Green et al., 1990, Kapp, 1996, Doering et al., 1980).

In 1987, two Canadian researchers (Hodnett and Simmons-Tropea, 1987) further revised Oliver's (Oliver, 1972) instrument to measure labour agentry or the degree a woman perceives herself to have control during childbirth by altering the structure and refining the scale items. The resulting instrument, the Labour Agentry Scale (LAS), was tested for reliability by item analyses, factor analyses and dual-scaling techniques and field studies were conducted to establish discriminant and predictive validity. During testing, LAS was administered to 183 antepartum and 497 postpartum women in Canada and showed strong evidence of reliability and validity as a measure of childbirth control (Hodnett and Simmons-Tropea, 1987).

Since its development the LAS, or variants of it, has been widely accepted as a good measure of control during childbirth and it has been identified internationally by midwives as a useful tool for assessing control as an element of maternal well-being (ICM Research Standing Committee, 2003). It has also been used extensively with Canadian populations (Crane et al., 2003, Fraser et al., 1997, Fraser et al., 2000b, Hodnett et al., 1997, Janssen et al., 2006a, Labrecque et al., 1999a, Labrecque et al., 1999b) and

elsewhere (Bramadat, 1990, Cheung et al., 2007, Kelly et al., 1999-2001, Goodman et al., 2004, Janssen et al., 2006a, Ohel et al., 2006, Kimber et al., 2008). and been translated into at least two other languages (Cheung et al., 2007, Labrecque et al., 1999b). Cronbach's alpha coefficients have been consistently above 0.86 (Hodnett et al., 1997). Although a 29 item scale at the time it was initially developed and tested, LAS has since been further developed to a 10 item scale which has been shown to be useful and valid with a Cronbach's alpha reliability of 0.84 (Kelly et al., 1999-2001, Kimber et al., 2008).

Control during childbirth was measured in IMSEP participants by administering the LAS, at 1 week after the birth. The LAS was then a 29 item scale with total scores ranging from 29 to 203. Each Item is a seven step Likert scale anchored by a positive statement at one end and a negative statement at the other end. Questions 5, 7, 8, 12, 14, 16, 18, 19, 20, 22, 25, 26 and 27 are negatively stated so that the scores for these questions needed to be reversed. In this study, construct validity was evaluated using principal components factor analysis to identify underlying constructs. It was revealed that 6 factors accounted for the greatest variance among items. This corresponded with Eigenvalues greater than 1.2. Cronbach's alpha for the 29 items was 0.90 (n=131).

Question 20 was incomplete when administered due to a printing error but when the incomplete item was removed internal consistency remained at 0.90. Because of the high internal consistency among the items, an estimate for the incomplete item was calculated based on the mean scores achieved by each participant. All but 2 of the 146 participants returned the questionnaire but not all respondents answered all 29 questions. Question 24 "I experienced a sense of active striving" was not answered by 12 women and 3 women did not answer question 4 "I felt very responsible". Question 1 "I felt competent" and question 2 "I was dealing with labour" were each unanswered by one woman. To estimate total LAS scores, a mean was calculated for each woman from the scores of all the questions that she answered. This mean was then multiplied by 29, the total number of questions on the LAS, to yield an estimated total score.

5.6.2.1.1.3 The Edinburgh Postnatal Depression Scale (EPDS)

As with control, postnatal depression, although not a direct measure of satisfaction, is known to be less prevalent in women with high levels of satisfaction (O'Brien et al., 2004, Kelly et al., 1999-2001). Postnatal depression has consistently been associated with women's satisfaction during childbirth (Green et al., 1990, Logsdon et al., 2006, Sekizuka, 2005) and it has been suggested that it is an even more important soft outcome than satisfaction when evaluating quality of care (Shearer, 1987).

Postnatal depression, also known as postpartum depression, is part of a continuum of maternal mood states that range from postnatal blues to puerperal psychosis (Lee and Chung, 2007). Postnatal blues, also known as baby blues, is a normal, self-limiting depressed mood and is experienced by up to 85% of women (Boyd et al., 2005). Postpartum depression is a serious disease which occurs in between10% and 15% of women, although prevalences of between 4.5% and 28% have been recorded (Scottish Intercollegiate Guidelines Network, 2002). In very rare, extreme cases, postpartum depression may include the psychotic symptoms, such as auditory hallucinations and delusions, of puerperal psychosis (Lee and Chung, 2007). Professional support has been shown to alleviate postnatal depression, negative birth experience, and other birth related distress (Fisher et al., 2006, Lavender et al., 1999, Barnett and Parker, 1985, Corney, 1980, Webster et al., 2001, Waldenstrom, 1999, Gamble and Creedy, 2009, Simkin, 1991) suggesting how an evaluation of affective maternal mood may indirectly reflect satisfaction with care.

Many researchers conducting studies on post partum depression use the EPDS to identify probable postnatal depression (Lee and Chung, 2007). The EPDS was developed in 1987 as the result of an observed failure of existing tools for the diagnosis of depression to adequately recognize depression when used in postpartum populations (Cox et al., 1987). After extensive pilot interviews the EPDS was validated with 84 mothers and found to have sensitivity of 85%, specificity of 77% and a positive predictive value of 83%; split-half reliability was 0.88 and the standardized α-coefficient was 0.87,

indicating the scale had satisfactory validity and reliability. The EPDS was also found to be sensitive to changes in severity of depression over time (t=3.72, p=0.002) (Cox et al., 1987).

The EDPS has been translated into numerous languages and found to have acceptable levels of reliability and validity (Becht et al., 2001, Benvenuti et al., 1999, Berle et al., 2003, Cantalino et al., 2007, Felice et al., 2004, Garcia-Esteve et al., 2003, Jardri et al., 2006, Karaçam and Ançe, In Press, Mazahari and Nakhaee, 2007, Pitanupong et al., 2007, Teng et al., 2005, Werrett and Clifford, 2006, Yamashita et al., 2000) except for some non-western nations, mostly in Africa, where cultural factors are hypothesized to diminish its value as a measure of depressive mood states (Hanlon et al., 2008, Pollock et al., 2006, Stewart et al., In Press, Weobong et al., In Press). It has also been converted into an internet version and found to be as reliable as a paper and pencil version (Spek et al., 2008).

The EDPS is the most extensively studied measure of postpartum depression (Boyd et al., 2005, Pawlby et al., 2008). It has consistently proved to have high levels of validity and reliability although it has been shown that a simple diagnostic clinical interview can better unequivocally diagnose postnatal depression in some women (Pawlby et al., 2008). Overtime, a number of other tools to measure postpartum depression have been developed and tested against EPDS (Breese McCoy et al., 2005, Dennis, 2004, Hanusa et al., 2008, Su et al., 2007) but none have been found to be superior. Having been widely accepted as the instrument of choice for screening for maternal postnatal depression, EPDS is now being tested and found valid for use with postpartum men (Goodman et al., 2004, Moran and O'Hara, 2006) although a lower cut off score has been recommended (Matthey et al., 2001). The many versions of the EPDS continue to be used globally for the study of postnatal depression by midwives (Cooke et al., 2007, Hildingsson et al., In Press, Öhman et al., In Press, Yelland et al., In Press, Taylor and Johnson, In Press) and others (Josefsson and Sydsjö, 2007, Montgomery, 2000, Morris-Rush et al., 2003, Murray et al., 2004).

The EDPS was administered to women in the IMSEP study between 4 and 6 weeks after giving birth. It consists of 10 items with 4 possible responses related to mood from which the woman selects the response which best describes her feelings during the past week. A score of 0 to 3 may be achieved for each item with a score of 0 suggesting no symptoms and increasing scores reflecting increasingly severe symptoms. The developer's validation study showed that "mothers who scored above a threshold 12/13 were likely to be suffering from depressive illness of some severity" (Cox et al., 1987 p. 786). Although researchers have suggested other cut-off scores, ranging from 9 to 13 (Hanusa et al., 2008), the developer's recommendation of a 12/13 cut off was used for the IMSEP study.

5.6.2.1.2 Health Professional Questionnaires

Midwives and other health care professionals who interacted with IMSEP participants were asked to collect demographic and clinical outcome data using survey questionnaires. The questionnaires are shown in Appendix J. Midwives completed three questionnaires for all participants and one additional questionnaire if transportation of the woman or her baby occurred.

5.6.2.1.2.1 Midwife Questionnaires

Midwives recorded a summary of data on key variables on two questionnaires. The questionnaires were designed, one for antenatal and postnatal and one for birth, to reflect the format of provincial records and reduce the reporting burden for midwives. The two questionnaires were the Summary of Provincial Records and General Care (SPRGC) and the Summary of Intrapartum Record and Birth Care (SIRBC). The two provincial summary records were adapted from the Foothills Perinatal Clinical Data Set (Harvey et al., 1996) which was adapted, with permission from the Nurse-Midwifery Clinical Dataset (NMCD) developed by the American College of Nurse Midwives as a uniform data collection instrument that addressed all three components of quality assurance, structure, process and outcomes. Following selection of variables from review of the literature and previously designed instruments, a first draft of the NMCD was submitted to expert panel review (Greener, 1990). As part of the process of developing the data

collection tool the college conducted a pilot study of the revised draft, in 13 settings that resulted in a total of 650 data forms being completed. Validity of the instrument was established by examination of data completion, criterion related validity and construct-related validity in comparison with previous outcome data and record review (Greener, 1990). After being minimally adjusted to the Alberta situation and renamed, the Foothills Perinatal Clinical Data Set was submitted to review by a panel of 15 local and national experts and pilot tested prior to use (Harvey, 1996).

In addition to the Foothills Perinatal Data Set, several questions related to general care and out-of-hospital births were added based on the work of the Alberta Midwifery Data and Reporting Working Group (Midwifery Data and Reporting Working Group, 1997) the Alberta Association of Midwives Client Information Form (Gibbons and Tutt, 1998)), the Alberta Midwifery Regulations (Government of Alberta, 1996) and the British Columbia Homebirth Demonstration Program Evaluation (Gale, 1997).

5.6.3 Pilot Study

Prior to beginning data collection, and before the withdrawal of Rural Region 3, a pilot study of the data collection instruments to be used in the evaluation was conducted. Forty-five sets of data collection forms and questionnaires were distributed to the 15 practising midwives in the five participating health regions. The midwives were instructed to use the forms with existing clients to evaluate their clarity, comprehensiveness and response burden as well as to identify any procedural difficulties with using them. Fifteen (33.3%) completed or partially completed data collection forms were returned by the completion date of the pilot study.

The data collection protocol appeared to be of minimal response burden to the midwives and their clients and no suggestions for procedural change were received. Following a review of the comments and suggestions received from the midwives, thirteen minor revisions were made to refine the data collection forms. As a result of data base development for the comparison study three improvements to the data collection forms were

suggested during the pilot study period. The report of the pilot study is presented in Appendix K.

5.6.4. Database Access

In addition to the data collected by the survey method, provincial and regional health record databases were accessed to collect data for all 146 study participants and the 292 matched controls. To meet health ministry requirements for confidentiality and privacy all data was retrieved by government employees and stripped of any identification markers prior to release to the investigators. Although not all demographic and clinical outcome data collected for IMSEP participants was available in the provincial databases as much as was available was retrieved for both groups.

5.7 Procedure

5.7.1 Participant Enrolment

Enrolment was a more formidable task than had been anticipated. Reasons for this were,1) the long delay between announcement of the study funding and the commencement of enrolment into the study, 2) the very large number of inquiries that were made about the study, 3) ensuring equity in distributing clients to participating midwives at a rate that they were able to accommodate, 4) the need to have respect for the client's choice of midwife provider while attempting to distribute clients as equitably and as sequentially as possible, depending on midwife availability in each area and 5) the midwives' lack of understanding of the protocol.

Women indicated their interest in participating in the study by calling a toll free 24-hour telephone number established for this purpose and leaving a message on the voice mail system. This afforded the women the opportunity to call at any time convenient to them. The telephone number was installed soon after the grant was awarded and the voice-mail initially had the capacity for 20 messages. Even though messages were cleared on at least one occasion during every working day, potential participants frequently expressed concern that they were unable to leave messages because the

message box was full. In response to this concern the voice-mail capacity was increased to hold 50 messages.

During the 18 months before the study commenced 1,800 inquiries were recorded of which 600 were from women who considered themselves eligible for inclusion in the study. The order in which women initially called the study line was the order in which study personnel contacted them to assess their eligibility for study enrolment.

Participants were enrolled as sequentially as possible from the list of those who indicated their interest in the study and appeared to be eligible. A total of 356 women were contacted before the study quota of 158 women was filled. Based on the available funding, it was planned that 150 women would be enrolled but when women dropped out of the study early, sufficient funds were available to enrol a limited number of women to replace them. Once a woman was enrolled, she was considered a study participant for the purposes of analysis whether she continued to receive midwifery care or not. Of the 356 women who were contacted, 195 were not included for a variety of reasons as detailed in Table 5.4.

Reasons for Declining to Participate in or Being Excluded from Study	
Reason	**Count**
Quota for health region was filled	97
Gestational age > 20 weeks	22
Miscarriage	18
Research team unable to contact to follow up	13
Midwife refused care, high risk or quota filled for particular month	11
Decided to receive primary care from physician	10
Not pregnant	7
Not a resident of a participating health region	7
Moved	3
Unable to find a midwife	3
Withdrew self because of real/implied additional costs	3
Family pressure to seek obstetrical care	1

Table 5.4

Of the 158 women who were enrolled in the study, 10 withdrew as detailed in Table 5.5. Most women who withdrew from the study did so soon after enrolment so demographic data are not available for many of them.

Reasons for Withdrawing from Study	
Reason	**Count**
Miscarriage	2
Incompatibility with midwife	2
Pregnancy deemed high risk	2
Family pressures to seek obstetrical care	1
Moved out of province	1
Not pregnant	1
No reason given	1

Table 5.5

Two of the participants gave birth to twins. Data for these two women were not included in the analysis because reporting details of these pregnancies and births could lead to identification of the participants. In both cases, the midwives transferred primary care to obstetricians but remained in attendance at the births. Both sets of twins were born in hospital. All 4 babies weighed more than 2,500 grams. The outcomes for mothers and babies were excellent. The final sample size for the evaluation was 146. Figure 5.1 presents a flowchart of the selection process.

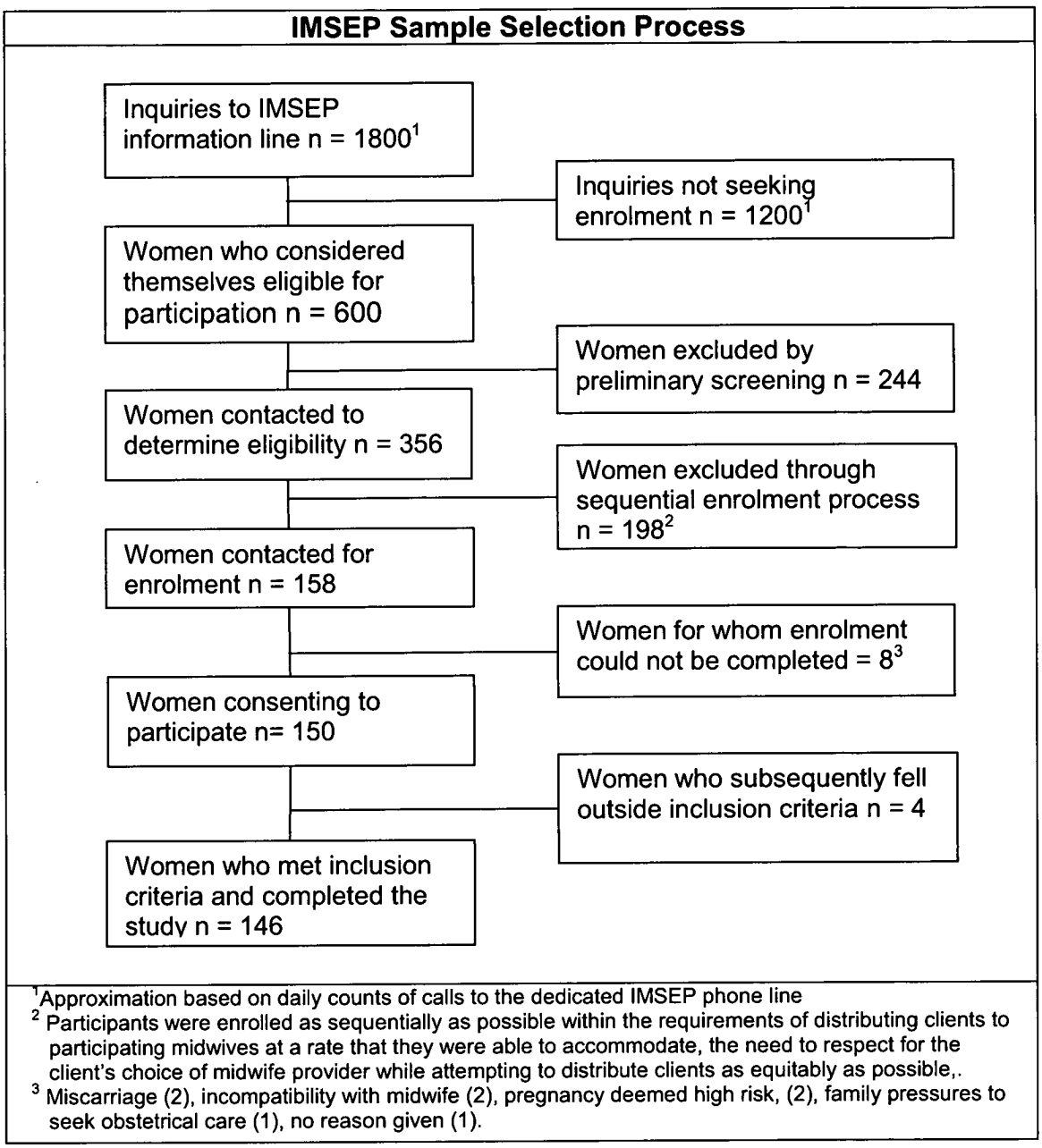

Figure 5.2

With perseverance, an equitable distribution of participants among midwives was obtained based on the number of midwives with hospital privileges in the regions. In the two urban areas 104 women were enrolled and 42 women were enrolled in the two rural areas as presented in Table 5.6. The proportion of participants in the two rural regions was higher than planned because of the withdrawal of the third rural region. Distribution of clients was also equitable among the eligible participating midwives based on the number of clients each midwife would normally book per month.

Distribution of Participants by Health Region		
Health Region	**Count (n)**	**Percent (%)**
Urban Region1	52	35.6
Rural Region 1	33	22.6
Rural Region 2	9	6.2
Urban Region 2	52	35.6

Table 5.6

The various questionnaires were printed on different coloured paper, coded by who would complete them, for easy differentiation and the sets were assembled into packets for each of the 146 study participants with copies of the information letters and consent forms. Each packet also contained detailed instructions for midwives on distribution of the questionnaires and the data collection process. A brief summary of the instructions for day to day use and a check list for documenting distribution, completion and return of the questionnaires was also included in each packet. Each set of questionnaires was numbered with the participant's study identification number so that the packet could be reassembled after all data were collected. Three stamped addressed envelopes were also included in each package so that clients and other health care professionals could return their completed questionnaires directly to the research team. All midwives received an information letter about the study and signed a consent form prior to being assigned clients for IMSEP.

When the midwife enrolled a client into the study, she opened the packet and provided the client with opportunity to read the information letters and ask questions before signing the consent forms. After signing the consent the client was given the three participant questionnaires with two stamped addressed envelopes and instructions for returning them. The questionnaires the client received consisted of 1) Labour Agentry Scale to be completed as soon as possible and before six weeks after the birth of the baby, 2) Client Experience and Satisfaction to be completed as soon as possible after the final visit with the midwife and 3) Edinburgh Postnatal Depression Scale also to be completed as soon as possible after the final midwife visit.

The midwife retained and added to her client record, the 1) Summary of Provincial Records and General Care, 2) Summary of Provincial Intrapartum

Record and Birth Care, questionnaires. The midwife was asked to review these study documents at each client encounter and to enter data when appropriate.

Midwives were asked to call the research office on the toll free number within 48 hours of a birth occurring so that participants could be contacted by telephone if questionnaires that had been provided to them were not returned by the specified time. Finally the midwife was asked to check the client record at the time she discharged the client from her care to ensure that all midwife questionnaires and the check sheet had been fully completed and arrange for the packet to be picked up by a member of the research team.

5.7.2 Protocol for entry and cleaning of data

It was proposed that data would be entered into an MS Access database that was established for this project. However, the database was cumbersome to use and errors encountered while entering data with this system were unacceptably high. Consequently, a spreadsheet was created to establish a database using the Statistical Packages for Social Sciences (SPSS) and data were exported to this new database. A statistician guided the project director and research assistants in improving database function and readability. Research assistants entered the data as it was received. Accuracy of data entry was assessed through random comparisons with original copies of the questionnaires by the project director or one of the investigators. During analyses, data were further cleaned by conducting periodic checks for data entry through random selection of cases under the direction of the project director. The interval between selected cases rarely exceeded 10 but was much less if errors in data entry were discovered. Conflicting information or discrepancies in reported data were discussed and resolved by one of the principal investigators. Changes or clarifications in data were noted on the original copy of the questionnaire by a stamped star.

To ensure that the data collected from the midwives was accurate and complete, a list of questionnaires received from the midwives was compiled along with the date that each one was received at the research office.

Research assistants read each returned questionnaire and missing data were noted on a separate sheet under the midwife's ID number. An additional questionnaire was then sent to the midwife with the client's ID number written on it and the unanswered questions were circled. A second questionnaire was sent if there was no response within an expected amount of time. The questionnaires were mailed except for a few that were faxed to rural areas. If clarification was necessary, the midwives were contacted by telephone. If the midwife desired, a research assistant would visit to transcribe the missing data directly from the participant's health record. Once the second questionnaire was received by the research office, the new or additional data were entered into the database. If there was an error or the information was inconsistent with that already provided, the research assistant would contact the midwife directly.

Questionnaires returned by midwifery clients were handled in a way similar to those returned by their midwives. Once they arrived in the research office, research assistants reviewed them to ensure that the questions were answered. If midwifery clients failed to return any of the questionnaires, a second one was mailed to them. If the client had moved, research assistants contacted her midwife to ask for a current address.

5.8 Conclusion

In summary, the IMSEP study was conducted in three parts; a prospective, descriptive study of a volunteer cohort of women receiving midwifery care, a retrospective comparative study with a matched cohort of women receiving care from other caregivers and a qualitative analysis of focus group and interview data for a group of stakeholders in the integration of midwifery. The description of selected outcomes was proposed after the commencement of the IMSEP study and was not commenced until after the data analysis for IMSEP was well underway. For the ROMM study, an in depth reanalysis was conducted, using SPSS, of data from the IMSEP study for outcomes selected for their theorized sensitivity to models of midwifery. The results of the reanalysis are presented in Chapter 6.

Chapter: 6 Analysis and Findings of the Description of Selected Outcomes

As described in Chapter 5, 158 women were enrolled into the IMSEP study with 148 completing their course of midwifery care. Two women gave birth to twins and were excluded from the analysis. The primary data source analyzed was the dataset collected for the IMSEP study by the midwives who participated in the study. The quality of this data is believed to be superior to the other sources of data available as it was collected prospectively and specifically for the purpose of the study. It was therefore selected as the primary source even though it is only available for the midwifery care group. This chapter presents the findings for my reanalysis of the primary data for the variables of interest in the Relationship between Outcomes and Midwifery Models (ROMM) as a cohort and stratified by planned birth setting.

The provincial record dataset, a secondary source of data, contains a limited number of variables for the study and comparison groups and consists of data combined from the datasets of various government departments as a routine provincial health statistics database. The provincial database was accessed because it is the only source of economic data available which was needed for the IMSEP economic evaluation. The small amount of demographic, intervention and clinical outcome data in the provincial database was a fortuitous extra and was useful for validating midwife collected data. The two sets of data are similar enough to support the validity of the IMSEP data although small differences do occur, most probably a result of the different data collection and organization methods. A full account of the analysis of the provincial data is available in the final IMSEP report (O'Brien et al., 2004). Where the data are available from the provincial database for the outcomes of interest they are included in this chapter to provide contextual information regarding standard maternity care in the province at the time of the study. All data from the provincial records, for the group who received physician care (MD) and the group who received

midwife care (RM) will be presented [*in parenthesis and italics*] to ensure the two different data sets are not confused.

6.1 Overall Descriptive Findings for Selected Outcomes

6.1.1 Demographic Characteristics

6.1.1.1 Age

The ages of women who participated in the study and received midwifery care ranged from 19.3 to 41.7 years at the time of the birth of their babies. Their average age was 30.55 years (SD 4.85). [*RM 30.14 years; MD 30.03years; t=0.22, 434 DF, p=0.83, 2-tailed*].

6.1.1.2 Ethnicity

Of the 146 participants who responded to the question of ethnicity, the majority 137 (93.8%) identified themselves as Caucasian. The remaining 9 (6.1%) identified themselves as having one of eight other ethnic backgrounds as shown in Table 6.1.

Ethnicity		
Ethnic Type	**Count (n=146)**	**Percent (%)**
Caucasian	137	93.9
Aboriginal	1	0.7
Mauritian	1	0.7
Latin American	1	0.7
Metis	2	1.4
Spanish	1	0.7
½ West Indian	1	0.7
Mixed	1	0.7
Other	1	0.7

Table 6.1

6.1.1.3 Education

Of 143 women who reported their level of educational achievement the majority had received formal education beyond high school. Forty (28.0%) women had attained college or technical school diplomas and 65 (45.5%) had graduate or post-graduate degrees. Thirty-eight (26.6%) had only high school education or less as shown in Table 6.2.

Education		
Education Level	**Count (n=143)**	**Percent (%)**
Grade School	1	0.7
High School	37	25.9
College or Technical School	40	28.0
University Degree	52	36.4
Postgraduate Degree	13	9.1

Table 6.2

6.1.1.4 Marital Status

Of 144 participants who reported their marital status, 137 (95.1%) were married or living in a stable relationship. Seven (4.9%) were lone parents Details of marital status are presented in Table 6.3.

Marital Status		
Status	**Count (n=144)**	**Percent (%)**
Married	119	82.6
Living with Partner	18	12.5
Separated	1	0.7
Divorced	1	0.7
Single	5	3.5

Table 6.3

6.1.2 Pregnancy Related Characteristics Enrolment

6.1.2.1 Parity and Gravida

A live or stillborn child born at 20 or more weeks gestation and weighing 500 grams or more is considered viable in Canada (Canadian Perinatal Surveillance System 2003). The parity or number of times a woman had given birth to a viable child ranged from 0 to 6 and is detailed in Table 6.4.

Parity		
Number of Births	**Count (n=145)**	**Percent (%)**
0	57	39.3
1	58	40.0
2	19	13.1
3	5	3.4
4	2	1.4
5	2	1.4
6	2	1.4

Table 6.4

The gravida or number of times a woman had been pregnant regardless of the outcome and including the current pregnancy ranged from 1 to 8. Data were available for all 146 participants and 42 (28.8%) were primigravid having their first pregnancy and 104 (41.8%) were multigravid and reported one or more than one previous pregnancy and are detailed in Table 6.5

Gravida		
Number of Pregnancies	**Count (n=146)**	**Percent (%)**
1	42	28.8
2	61	41.8
3	26	17.8
4	7	4.8
5	4	2.7
6	2	1.4
7	3	2.1
8	1	0.7

Table 6.5

Of the 145 participants for whom data were available, 57(39.3%) were nulliparous having never given birth to a viable baby and the remaining 88 (60.7%) were multiparous having given birth to a viable child at least once. [*As provincial data were collected retrospectively none is available regarding nulliparity. Cohorts were matched for parity but, unfortunately, after the match was made, parity was higher for the MD group (3 versus 2; t=-6.3, 355.4 DF, p<0.0001, 2-tailed) because of inexact matches for those experiencing 3 or more births. However, in both groups the majority was experiencing their first or second birth and for those the match was exact (O'Brien et al., In Review)].*

One hundred (68.5%) women reported no previous pregnancy loss before 20 weeks gestation; 38 (26%) reported 1 loss and 8 (5.5%) reported more than one loss. Of the women who reported pregnancy losses prior to 20 weeks, 24 (17.6) reported them as spontaneous abortions as detailed in Table 6.6. Two (1.5%) reported a previous ectopic pregnancy and these are included with data describing spontaneous abortions.

History of Spontaneous Abortion		
Number of Abortions	Count (n=136)	Percent (%)
0	112	82.4
1	20	14.7
2	2	1.5
3	1	0.7
4	1	0.7

Table 6.6

Only 9 (6.2%) reported a previous elective abortion. Ten women did not report on whether they had had previous abortions.

6.1.2.2 Gestational Age

The study protocol required all women to be enrolled into the study prior to completing 20 weeks gestation in order to ensure they received a full course of midwifery care. Although only 115 (78.8%) women were, in fact, enrolled prior to completing 20 weeks the remaining 31 (21.2%) were receiving care from a midwife by the time they completed 20 weeks gestation and so received a full course of midwifery care as detailed in Table 6.7.

Gestational Age at Enrollment		
Gestational Age	Count (n=146)	Percent (%)
>20 weeks	31	21.2
<20 weeks	113	77.4
20 weeks	2	1.4

Table 6.7

6.1.2.3 Risk Factors

Initial risk scores were reported for 145 women and ranged from 0 to 5. The risk scoring system (Alberta Medical Association, 1994), which is the local standard, is open ended with no fixed maximum. Several women were excluded from the study, either by themselves or by their midwife, because they were judged to be at too high risk for midwifery care. Women were classified for level of antenatal risk according to the provincial guidelines which are presented in Appendix F. None of the women for whom data were available was assessed to be at high risk with a score greater than 6: 132 (91.0%) were judged to score less than 3 or to be at low risk and 13 (9.0%)

were assessed to score 3 to 6 or be at moderate risk as detailed in Table 6.8.

Initial Visit Risk Assessment		
Risk Score	Count (n=145)	Percent (%)
0	99	68.3
1	15	10.3
2	18	12.4
3	6	4.1
4	5	3.4
5	2	1.4

Table 6.8

Intrapartum risk assessments were reported for all participants and ranged from 0 to 4 out of a possible total of 12 as detailed in Table 6.9.

Intrapartum Risk Assessment		
Risk Score	Count (n=146)	Percent (%)
0	114	78.1
1	21	14.4
2	8	5.5
3	2	1.4
4	1	0.7

Table 6.9

Although high or low categories are not assigned for intrapartum risk, all intrapartum scores were considered to be in a relatively low range.

6.1.2.4 Location of Birth

For the purposes of this thesis the location that a birth occurred is categorized by place and setting. Place of birth refers to the address or geographic area where the birth took place, such as urban or rural. Birth setting refers the type of environment in which the birth occurred, such as home or hospital.

Home and birth centre births were also combined as out-of-hospital births with 56 (38.4%) having taken place in hospital and 90 (61.6%) having taken place out-of-hospital. Of the 56 women who birthed in hospital, 2 actually birthed in hospital parking lots and their data are included with hospital births.

The majority of out-of-hospital births occurred in a home setting as detailed in Table 6.10.

Actual Birth Setting		
Location	**Count (n=146)**	**Percent (%)**
Home	84	57.5
Hospital	56	38.4
Birth Centre	6	4.1

Table 6.10

Midwives also reported where the participants intended to give birth at 36 weeks gestation and again at the onset of labour as detailed in Table 6.11. On 25 occasions, women who planned to birth at home at 36 weeks later made a decision to birth in hospital. This was most often a mutual decision of the woman and her midwife as a result of an increase in risk assessment. The decision not to have an out-of–hospital birth as a result of increased risk occurred at 37 weeks for one woman, 38 weeks for two women, 39 weeks for one 1 woman, 41 weeks for one woman and during labour for eight women. There were also 10 occasions when care was transferred to a physician and as a result out-of-hospital birth was no longer an option. The remaining two women made a decision to birth in hospital for non-clinical reasons.

Planned Birth Settings		
Setting	**Planned at 36 weeks n(%)**	**Planned at Onset of Labour n(%)**
Home	104 (71.2)	101 (69.2)
Hospital	37 (25.3)	40 (27.4)
Birth Centre	5 (3.4)	5(3.4)

Table 6.11

The population for the urban areas was much greater than the rural areas and the majority of the midwives practising in the province at the time of the study were clustered in the urban centres. Distribution of births in the study reflected these differences with 104 (71.2%) occurring in the urban centres and 42 (28.8%) occurring in the rural areas. In each urban and rural health region the percentage of out-of-hospital births was greater than the

percentage for hospital births and ranged from 53.8% to 75.8%. Hospital births ranged from 24.2% to 44.4% as detailed in Table 6.12.

Relationship between Birth Setting and Health Regions							
Health Region	Birth Setting						Total
	Home		Hospital		Birth Centre		
	Count (n=84)	Percent (%)	Count (n=56)	Percent (%)	Count (n=6)	Percent (%)	
Urban 1	26	50.5	20	38.5	6	11.5	52
Rural 1	25	75.8	8	24.2	0	0	33
Rural 2	5	55.6	4	44.4	0	0	9
Urban 2	28	53.8	24	46.2	0	0	52
Note: Percentages reflect row totals in this table							

Table 6.12

6.1.3 Clinical Outcomes

A number of clinical outcomes were selected as variables of interest for study, as described in Chapter 5, as there was some evidence to suggest they may be influenced by the model of midwifery care as described in Chapter 1.

6.1.3.1 Maternal Clinical Outcomes

Reported maternal clinical outcomes for the 146 women who participated in the study revealed no mortality or long term morbidity.

6.1.3.1.1 Type of Birth

Of the 146 babies born to women in the study, 126 (86.3%) were unassisted spontaneous vaginal births (NSVB) where no forceps, vacuum extraction or operative delivery occurred and 20 (13.7%) were assisted by vacuum, forceps or operative delivery as shown in Table 6.13 [*MW - n= 142, NSVB 124(86.1%); Assisted Birth 18(12.5%); MD n=288, NSVB 240(82.2%); Assisted Birth 48(16.4%)*]. Of the assisted births 15 (10.3%) were Caesarean births [*MW – n=142, C/S 14(9.9%); MD n=288, C/S 25(8.7%). There were no between group differences in the incidences of Caesarean or assisted births (O'Brien et al., In Review)*]. All interventions were performed by physicians while the participants were receiving shared care between the midwife and physician or the care had been officially transferred to a physician.

Type of Birth		
Birth Type	Count (n=146)	Percent (%)
NSVB Cephalic	124	84.9
NSVB Breech	2	1.4
Mid-forceps	3	2.1
Vacuum	2	1.4
Caesarean	15	10.3

Table 6.13

6.1.3.1.2 Perineal and Vaginal Trauma

Of the 146 women in the study, 53 (37%) had intact perinea and 34 (23%) had minor perineal lacerations that did not need suturing. Fifteen women (10.3%) were at decreased risk of vaginal or perineal trauma as they gave birth assisted by Caesarean section; nevertheless they are included in the data presented because some may have been in labour for extended periods, thus being exposed to some degree of trauma even though none of them had episiotomies. Episiotomies were performed on 8 (5.5%) of the women in the study, as detailed in Table 6.14, either by the midwife or by a physician.

Type of Episiotomy		
Episiotomy Type	Count (n=146)	Percent (%)
None	138	94.5
Medio-lateral	4	2.7
Midline	4	2.7

Table 6.14

Of the eight episiotomies 5 (62.5%) occurred in association with births that were not spontaneous, cephalic births and were categorized as assisted deliveries; 1 (12.5%) was associated with a breech birth, 3 (37.5%) with mid-forceps births, 2 (25%) with vacuum births and the remaining 3 (37.5%) with spontaneous cephalic births. Details are presented in Table 6.15.

Relationship between Episiotomy and Type of Birth							
Type of Birth	Episiotomy						Total
	None		Medio-lateral		Midline		
	Count (n=138)	Percent (%)	Count (n=4)	Percent (%)	Count (n=4)	Percent (%)	
NSVB Cephalic	121	97.6	1	0.81	2	1.61	124
NSVB Breech	1	50.0	0	0.0	1	50.0	2
Mid-forceps	0	0.0	3	100.0	0	0.00	3
Vacuum	1	50.0	0	0.0	1	50.0	2
Caesarean	15	100.0	0	0.0	0	0.0	15
Note: Percentages reflect row totals in this table							

Table 6.15

In addition to the rates of episiotomy, midwives recorded data related to trauma to the birth canal. In total 94 lacerations of the cervix, vagina and perineum were recorded.

Perineal Trauma		
Type of Laceration	Count (n=94)	Percent (%)
Minor Birth Canal Lacerations	34	33.3
Labial Lacerations	6	4.1
1st degree Perineal	18	12.3
2nd degree Perineal	31	21.2
3rd degree Perineal	3	2.1
4th degree Perineal	0	0.0
Vaginal Lacerations	1	0.7
Periuretheral/clitoral Lacerations	1	0.7
Cervical Lacerations	1	0.7

Table 6.16

One laceration was reported for each of vaginal, periurethral and cervical trauma. The majority of the perineal trauma consisted of first and second degree lacerations and no fourth degree lacerations were recorded as detailed in Table 6.16.

6.1.3.1.3 Labour Stimulation

Midwives reported that labour was stimulated for 29 (19.8%) participants. Of the 29 stimulated labours, 12(8.2%) were induced [*MW n=139, 11(7.9%); MD n=242, 54(22.8%); X^2 = 12.25, 1 DF, p<0.0001 2-tailed*] and 17 (11.7%) were augmented as shown in Table 6.17. Data were unavailable for one woman.

Labour Stimulation		
Stimulation	Count (n=145)	Percent (%)
None	116	80.2
Induction	12	8.2
Augmentation	17	11.6

Table 6.17

Of the 15 women who had Caesarean births 7(46.7%) were reported to have had their labour stimulated while of the 126 women who had spontaneous vaginal births 18 (4.3%) needed labour stimulation. The difference was significant between both labour stimulation and assisted birth (X^2 = 17.51, 1 DF, p<0.000 2-tailed) and between stimulation and Caesarean birth only (X^2 = 7.44, 1 DF, p<0.006 2-tailed).

6.1.3.1.4 Epidural

Midwives reported that 21(14.4%) of the 146 women in the study received an epidural. From the way the data were reported it was not possible to determine whether an epidural was performed to provide analgesia or anesthesia but it is likely that some of the 15 women who had Caesarean births received epidurals to anaesthetize them for surgery. Other women may have received epidurals for analgesia during labour prior to knowing they would need surgery. Yet other women who had Caesarean births may have received general anaesthesia and not had an epidural at all. However, if all Caesarean births are excluded, the rate of epidural is 9.2%. The relationship between epidural and type of birth is presented in Table 6.18.

Relationship between Epidural and Type of Delivery											
Epidural	Type of Delivery										Total
	NSVD Cephalic		NSVD Breech		Mid-forceps		Vacuum		Caesarean		
	Count (n= 124)	%	Count (n=2)	%	Count (n=3)	%	Count (n=2)	%	Count (n=15)	%	
None	116	93.5	2	100.0	1	33.3	0	0.0	6	40.0	125
Epidural	8	6.5	0	0.0	2	66.6	2	9.5	9	60.0	21

Table 6.18

6.1.6.1.5 Ultrasound Examination and Biophysical Profile

Ultrasound examination and Biophysical Profile (BPP) are reported together as they are closely related measures of fetal wellbeing. A BPP is a test of

fetal wellbeing, that combines ultrasound examination and electronic fetal monitoring to provide a score based on the parameters of fetal heart rate and variability, fetal movements, fetal breathing, amniotic fluid volume and placental maturation (Proud, 1994). In Canada, obstetrical ultrasound is used either as a routine screening test to confirm gestational age and examine the fetus for abnormalities or as a diagnostic tool if pregnancy complications are suspected.

Assessment of Fetal Wellbeing		
Number of Ultrasounds	**Type of Assessment**	
	Count (n=146)	**Percent (%)**
	Ultrasound Screen	
0	103	70.5
1	39	26.7
2	4	2.7
	Ultrasound Diagnostic	
0	113	77.4
1	31	21.2
2	2	1.4
	Biophysical Profile	
0	142	97.3
1	3	2.1
2	1	0.7

Table 6.19

Midwives reported a total of 84 ultrasounds were performed as indicated in Table 6.19. Only four Biophysical Profiles were reported as detailed in Table 6.19. It is not known whether these assessments were ordered by midwives or physicians.

6.1.3.1.6 Amniotomy

Although the rate of amniotomy may be influenced by the practice of the care provider and therefore was considered relevant to this analysis, no artificial ruptures of the membranes were reported. This is may be because amniotomy or artificial rupture of the membranes was not included as a separate category on the data collection form and in Canada; although amniotomy is regularly used to induce or augment labour it is usually classified as Artificial Rupture of Membranes (ARM) and not in the category of labour stimulation. Consequently, it is probable that midwives recorded

ARMs on the patient record but not on the study data collection survey form where there was no specific ARM category.

6.1.3.1.7 Intravenous Fluid Administration

Although a space was provided on the midwives questionnaire to document the administration of intravenous fluid, only one intravenous administration in labour was reported which was for a woman who gave birth at home. This may have been because in hospital, where most intravenous administration occurs, monitoring intravenous infusions is an ongoing responsibility for a midwife and recorded in the hospital record, frequently, on a special page, thus making additional recording appear unnecessary. As 15 women were known to have experienced Caesarean birth and 21 to have had epidural analgesia and both of these interventions required intravenous fluids, the recorded rate of intravenous fluid administration in labour was considered too unreliable to be reported in the findings of the study. However, intravenous fluids for all reasons, not just in labour, were reported for 23 (15.8%) women one of whom was reported to have received 2 intravenous fluid infusions.

6.1.3.1.8 Maternal Length of Hospital Stay

Although 101 women planned home births at the onset of labour, only 84 babies in the study were born at home, all but two of their mothers spent no time in hospital for the birth. Although only 5 mothers planned birth centre births, 6 were actually born in the birth centre and none of their mothers spent any time in hospital as presented. Only 40 women planned to give birth in hospital at the onset of labor but 56 did. Two women were admitted to hospital during the intrapartum or postpartum period following a home birth; one for a manual removal of her placenta and one for a postpartum haemorrage. A summary of admissions to hospital is presented in Table 6.20.

Hospital Admissions for Birth		
Hospital Admission	Count (n=146)	Percent (%)
Admitted to Hospital	56	38.4
Not admitted to Hospital	90	57.5

Table 6.20

The average length of hospital stay, from admission to discharge, for all women in the study was 14 hours and 29 minutes. Hospital stays after birth for women who had Caesarean births were longer than for women who did not have Caesarean births. The average length of hospital stay was 74 hours and 54 minutes for women who had Caesarean births and 16 hours and 56 minutes for women who were hospitalized and had vaginal births. Details are presented in Table 6.61.

Relationship between Type of Birth and Maternal Length of Hospital Stay					
Type of Birth	Count (n=146)	Minimum Hours	Maximum Hours	Average Hours	Standard Deviation
All	146	0	144	14.5	28.359
Vaginal (hospital)	131	0	89	16.9	16.553
Caesarean	15	25	144	74.9	29.975

Table 6.21

For the 56 women who were admitted to hospital the average length of stay from admission to discharge was 37 hours and 46 minutes. Details are presented in Table 6.22.

Length of Hospital Stay from Admission to Discharge				
Women	Count (n=146)	Range in Hours	Average Hours	Average Days
All Women	146	0 - 144	14.49	0.60
Women Admitted to Hospital	56	3 - 144	37.77	1.57
Women Admitted to Hospital with vaginal birth	49	3-89	16.94	0.71
Women Admitted to Hospital with Caesarean	15	25-144	74.90	3.12

Table 6.22

6.1.3.2 Neonatal Clinical Outcomes

The 146 women in the study gave birth to 60 (41.1%) female and 84 (57.5%) male babies. The gender of the remaining 2 was not reported. No mortality

or long term morbidity was reported for babies in this study. The gestational age at the time of birth was 36 to 37 weeks for 9 (6.2%) of the babies; 38 to 40 weeks for 93 (63.1%); and 41 to 42 weeks for 43 (29.7%). There were no births prior to 36 weeks or after 42 completed weeks of gestation for women receiving midwifery care at the time of birth or for women whose care had been transferred to a physician.

6.1.3.2.1 Birth Weight

Of the 146 babies in the study group, 4 were classified as low birth weight, weighing less than 2,500 grams (5lbs 0 oz) and of the remainder, 11 weighed more than 4,000 grams (9lbs 0 oz) as detailed in Table 6.23.

Birth Weights		
Weight Range in grams	**Count (n=146)**	**Percent (%)**
<2,500 grams	4	2.7
2,500 – 4,000 grams	131	89.7
>4,000 grams	11	7.5

Table 6.23

6.1.3.2.2 Apgar Score

At one minute after birth13 (8.9%) babies were assessed to have Apgar scores of less than 7 and by 5 minutes the number assessed to have Apgar scores of less than 7 was reduced to 2 (1.4%) as detailed in Table 6.24 [*<7 at 1 min - MW n=140, 14(10.0%); MD n=282, 35(12.4%)* X^2 *= 0.542, 1 DF, p<0.521, 2-tailed : <7 at 5 min - MW n=139, 2(1.4%); MD n=282, 4 (1.4%);* X^2 *= 0.000, 1 DF, p<0.987, 2-tailed*)].

Apgar Scores		
Apgar Score	**Count (n=146)**	**Percent (%)**
at 1 minute		
< 7	13	8.9
≥ 7	133	91.1
at 5 minutes		
< 7	2	1.4
≥ 7	144	98.6

Table 6.24

6.1.3.2.3 Admissions to a Neonatal Intensive Care Unit

Three (2.05%) of the babies born to women in the study were admitted to neonatal intensive care units. The reasons for admission were respiratory distress, difficult Caesarean section with facial palsy and nerve damage and sepsis. All were subsequently discharged in good condition.

Among all babies 115 (78.8%) were reported to have had no neonatal complications and 31 (21.2%) complications, ranging from mild to severe were reported for 28 babies. Four of the 31 identified complications were diagnosed in the same baby and related to respiratory problems. Two babies were born with congenital anomalies which were diagnoses as a 'hip click' and a 'split hand deformity'. The complication most commonly reported was a feeding problem. All reported complications are listed in Table 6.25 and include complications of babies whose care was transferred to a physician or whose mother's care was transferred to an obstetrician.

Neonatal Complications		
Complication	**Count (n=31)**	**Percent (%)**
Feeding problems	12	38.7
Neonatal jaundice	3	9.7
Neonatal sepsis/infection	2	6.5
Congenital anomalies	2	6.5
Respiratory distress syndrome	1	3.2
Pneumothorax	1	3.2
Possible hyaline membrane disease	1	3.2
Meconium aspiration	1	3.2
Bleeding from circumcision	1	3.2
Blocked tear duct	1	3.2
Fractured humerus related to a Caesarean birth	1	3.2
Group B streptococcal infection at 15 days age	1	3.2
Hypoglycaemia	1	3.2
Partial facial palsy and nerve damage to arm related to Caesarean birth	1	3.2
Unknown	2	6.5

Table 6.25

6.1.4 Satisfaction Outcomes

In order to assess the satisfaction outcomes for women in the study they were asked to respond to a set of questionnaires. As no data on satisfaction was collected by provincial record keepers it is not known how the satisfaction of women receiving midwifery care compares with women receiving standard maternity care.

6.1.4.1 Satisfaction

The Client's Experience and Satisfaction Questionnaire (CESQ), which was described in Chapter 5 and is presented in Appendix J, asked participants to rank their overall satisfaction with their childbirth experience on a 5-point scale with 1 being "not satisfied" and 5 being "very satisfied". It was completed by 144 women of whom 127 (88.2%) reported they were very satisfied, 14 (9.7%) were satisfied and 3 (2.1%) reported they were less than satisfied as presented in Table 6.26. The mean score for overall satisfaction was 4.84 (SD 0.52) out of a possible 5.

Overall Satisfaction with Childbirth Experience		
Satisfaction	**Count (n=144)**	**Percent (%)**
1 Not at all Satisfied	1	0.7
2	1	0.7
3	1	0.7
4	14	9.7
5 Very Satisfied	127	88.2

Table 6.26

Of the 144 women who returned the questionnaire, 84 (93.3%) of 90, whose births took place at home or in a birth centre reported they were very satisfied with their childbirth experience. For the 54 women whose births took place in hospital 43 (76.8%) women reported that they were very satisfied with their experience as presented in Table 6.27. The relationship between birth setting and level of satisfaction was not significant (t =1.69, 94 DF, p=0.95).

Relationship between Overall Satisfaction and Birth Setting					
Birth Setting	Satisfaction				Total
	Less than Very Satisfied		Very Satisfied		
	Count (n=17)	Percent (%)	Count (n=127)	Percent (%)	
Hospital	11	23.2	43	76.8	54
Out-of-Hospital	6	6.7	84	93.3	90
Note: Percentages reflect row totals in this table					

Table 6.27

For those women who had a spontaneous cephalic birth 112 (91.9%) reported being very satisfied with their childbirth experience. For those women whose birth was classified as complicated and included all other types of delivery, 15 (71%) reported being very satisfied with their birth experience as presented in detail in Table 6.28. The relationship between type of birth and satisfaction with birth experience was not significant (t = 1.83 19.5 DF, p=0.08).

Relationship between Overall Satisfaction and Birth Experience					
Type of Birth	Satisfaction				Total
	Less than Very Satisfied		Very Satisfied		
	Count (n=17)	Percent (%)	Count (n=127)	Percent (%)	
Uncomplicated	11	23.2	112	91.1	54
Complicated	6	6.7	15	71.94	90

Table 6.28

In addition to the question related to overall satisfaction with the childbirth experience, the CESQ asked women to rate their satisfaction on the same scale from 1-5 for four aspects of the care they had received from their midwives. All responses ranged from 3-5 and mean scores were all above 4.5. The details are presented in Table 6.29. It is interesting to note that all but 1 woman reported that they had tried to reach their midwife outside office hours.

Satisfaction with Care		
Satisfaction Item	**Mean**	**SD**
Time to ask questions and discuss concerns during pregnancy	4.97	0.17
Time to ask questions and discuss concerns during postpartum	4.92	0.35
Adequate information about how to reach caregiver in an emergency	4.97	0.22
Able to reach caregiver in a timely manner outside office hours	4.92	0.29

Table 6.29

6.1.4.2 Labour Agentry

The Labour Agentry Scale (LAS), which was described in Chapter 5 and is presented in Appendix J, assessed women's feelings of control and self efficacy. The estimated scores ranged from 96 to 203 with a mean of 185.25 (SD 18.2). Responses for the individual questions are listed in Table 6.30.

Labour Agentry Scale				
Item	Mean	SD	n	Range
1 I felt competent	6.4	0.9	134	2-7
2 I was dealing with labour	6.3	0.8	143	4-7
3 Everything made sense	6.5	1.0	144	1-7
4 I felt responsible	6.5	0.9	141	1-7
5 I felt incomplete and like I was going to pieces*	6.5	1.0	144	1-7
6 I felt secure	6.5	1.0	144	1-7
7 I felt incapable*	6.3	1.3	144	1-7
8 I experienced a sense of great anxiety*	6.3	1.3	144	1-7
9 I felt inadequate*	6.4	1.0	144	1-7
10 I felt open and receptive	6.2	1.2	144	1-7
11 I felt good about my behavior during labour	6.4	0.9	144	3-7
12 I felt powerless*	6.4	1.2	144	2-7
13 I experienced a sense of being with others who care	6.9	0.6	144	1-7
14 I didn't know what to expect from one moment to the next*	6.2	1.4	144	2-7
15 I experienced complete awareness of everything that was happening	6.3	1.1	144	2-7
16 Everything seemed unclear and unreal*	6.7	0.9	144	2-7
17 I felt relaxed	5.3	1.5	144	1-7
18 I experienced a sense of conflict*	6.5	1.2	144	1-7
19 I felt fearful*	6.0	1.5	144	1-7
20 I had a sense of not being (in control)	6.6	1.3	144	1-7
21 I felt important	6.5	1.1	144	1-7
22 Everything seemed wrong*	6.8	0.8	144	1-7
23 I felt victorious	6.2	1.2	144	1-7
24 I experienced a sense of active striving	6.2	1.3	132	1-7
25 I had a feeling of constriction and of being confined*	6.8	0.9	144	1-7
26 I felt awkward	6.4	1.2	144	1-7
27 Someone or something else was in charge of my? labour*	6.4	1.5	144	1-7
28 I experienced a sense of success	6.7	0.9	144	1-7
29 I had a sense of perspective on what was happening	6.6	0.9	144	2-7
Total for all items	185.25	18.2		96-203
*Reverse scoring				

Table 6.30

Using 1-way analysis of variance (ANOVA) there was an association between LAS and birth setting (F= 4.57, 2 DF, p=0.01) with scores for women experiencing home birth being significantly higher than for women experiencing hospital birth (mean difference 8.87, p=0.005). There was no difference between the LAS scores of women who experienced birth centre

birth with either the women who experienced home birth or the women who experienced hospital birth.

6.1.4.3 Postpartum Mood State

The same 144 women who returned the LAS also returned the Edinburgh Postnatal Depression Scale (EPDS) which was described in Chapter 5 and is presented in Appendix J. In the EPDS women were asked which response most accurately reflected how they had felt over the past six weeks.

All respondents answered all questions. Scores ranged from 0 to 19, out of a possible 30, with a mean of 5.41 (SD 3.9), a mode of 3 and a median of 5. Responses for the individual items are presented in Table 6.31.

Edinburgh Postnatal Depression Scale		
Item	**Mean**	**SD**
1 I have been able to laugh and see the funny side of things	0.18	0.42
2 I have looked forward with enjoyment to things	0.14	0.37
3 I have blamed myself unnecessarily when things went wrong*	1.01	0.82
4 I have been anxious or worried for no good reason	1.01	0.84
5 I have felt scared or panicky for no good reason*	0.60	0.76
6 Things have been getting on top of me*	1.05	0.67
7 I have been so unhappy that I have had difficulty sleeping*	0.26	0.60
8 I have felt sad or miserable*	0.63	0.61
9 I have been so unhappy that I have been crying*	0.51	0.57
10 The thought of harming myself has occurred to me*	0.05	0.28
Total for all items	**5.41**	**3.90**
***Reverse scoring**		

Table 6.31

The majority of women, 131 (91%) had scores of 11 or less. Of the remaining 13 women, 8 (5.6%) scored 12 and the remaining 5 (3.4%) had scores of greater than 12. Of the 5 women with scores greater than 12, two responded positively to the question asking if they ever felt like harming themselves. This posed a dilemma for the investigators between the woman's safety and maintaining confidentiality. In each case, when the midwife was contacted she was already aware of her client's condition and had instituted appropriate treatment.

Lower postpartum depression scores were associated with higher labour agency scores (r = -0.23, p= 0.005, 2-tailed).

6.2 Descriptive Findings for Selected Outcomes Stratified by Planned Birth Setting

Participants were stratified for further analysis by birth setting as out-of-hospital including women who, at the onset of labour, planned to give birth at home or in a birth centre and in hospital including all women who, at the onset of labour, planned to give birth in hospital.

6.2.1 Demographic Characteristics

6.2.1.1 Birth Setting

At the onset of labour 106 (72.6%) women planned to give birth in an out-of-hospital setting of whom 101 (69.2%) planned to birth at home and 5 (3.4%) planned to birth in a birth centre. The remaining 40 (27.4%) women planned to give birth in hospital.

6.2.1.2 Age

The average age of women who participated in the study and planned to give birth in an out-of-hospital setting was 30.35 (SD 4.94) years. The average age for women who planned to birth in hospital was 31.12 (SD 4.61) years.

6.2.1.3 Ethnicity

The majority 97 (91.5%) of women who planned an out-of-hospital birth identified themselves as Caucasian. The remaining 9 (8.1%) identified themselves as having one of nine other ethnic backgrounds as shown in Table 6.32. All women who planned a hospital birth (100%) identified themselves as Caucasian.

Ethnicity by Planned Birth Setting				
Ethnic Type	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)
Caucasian	97	91.5	40	100.0
Aboriginal	1	0.7	0	0.0
Mauritian	1	0.7	0	0.0
Latin American	1	0.7	0	0.0
Metis	2	1.4	0	0.0
Spanish	1	0.7	0	0.0
½ West Indian	1	0.7	0	0.0
Mixed	1	0.7	0	0.0
Other	1	0.7	0	0.0

Table 6.32

6.2.1.4 Education

Of 106 women who planned out-of-hospital births, 104 reported their level of educational achievement and the majority had received formal education beyond high school.

Education by Planned Birth Setting				
Education Level	Out of Hospital		In Hospital	
	Count (n=104)	Percent (%)	Count (n=38)	Percent (%)
Grade School	1	1.0	0	0.0
High School	30	28.8	7	18.4
College or Technical School	26	25.0	14	36.8
University Degree	39	37.5	12	31.6
Postgraduate Degree	8	7.7	5	12.2

Table 6.33

Of 40 women who planned to give birth in hospital 38 reported their level of educational achievement. The majority also reported receiving formal education beyond high school. Details of educational achievement are presented in Table 6.33.

6.2.1.5 Marital Status

Of 104 participants who reported their marital status and planned an out-of-hospital birth, 9 (93.5%) were married or living with a partner in a committed relationship. Seven (6.8%) were lone parents. All women planning an in

hospital birth reported their marital status and all were married or living in a stable relationship. Details of marital status are presented in Table 6.34.

Marital Status by Planned Birth Setting				
Status	Out of Hospital		In Hospital	
	Count (n=104)	Percent (%)	Count (n=40)	Percent (%)
Married	84	80.8	35	87.5
Living with Partner	13	12.5	5	12.5
Separated	1	1.0	0	0.0
Divorced	1	1.0	0	0.0
Single	5	4.8	0	0.0

Table 6.34

6.2.2 Pregnancy Related Characteristics

6.2.2.1 Parity and Gravida

The parity or number of times a woman had given birth to a viable child ranged from 0 to 6 for women who planned to birth out-of-hospital and from 0 to 2 for women who planned to birth in hospital as detailed in Table 6.35.

Parity by Planned Birth Setting				
Number of Births	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=39)	Percent (%)
0	38	35.8	19	48.7
1	43	40.6	15	38.5
2	14	13.2	5	12.8
3	5	4.5	0	0.0
4	2	1.9	0	0.0
5	2	1.9	0	0.0
6	2	1.9	0	0.0

Table 6.35

The gravida or number of times a woman had been pregnant regardless of the outcome and including the current pregnancy ranged from 1 to 8 for women planning to give birth in an out-of-hospital setting and from 1 to 3 for women who planned to give birth in hospital as detailed in Table 6.36.

Gravida by Planned Birth Setting				
Number of Pregnancies	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)
1	27	25.5	15	37.5
2	44	41.5	17	42.2
3	18	17.0	8	20.0
4	7	6.8	0	0.0
5	4	3.8	0	0.0
6	2	1.9	0	0.0
7	3	2.8	0	0.0
8	1	0.9	0	0.0

Table 6.36

Of the 145 participants for whom data were available, 38 (35.8%) who planned to give birth in an out-of-hospital setting and 19 (48.7%) who planned to give birth in hospital were nulliparous having never given birth to a viable baby

Eighteen (18.5%) women planning out-of-hospital births and 6 (15.8%) women who planned hospital births reported having one or more spontaneous abortions as detailed in Table 6.37.

History of Spontaneous Abortion by Planned Birth Setting				
Number of Abortions	Out of Hospital		In Hospital	
	Count (n=97)	Percent (%)	Count (n=38)	Percent (%)
0	79	81.4	32	84.2
1	14	14.4	6	15.8
2	2	2.1	0	0.0
3	1	1.0	0	0.0
4	1	1.0	0	0.0

Table 6.37

Nine (9.2%) women who planned to give birth in an out-of-hospital setting reported a total of 12 previous elective abortions. No previous elective abortions were reported by women planning to give birth in hospital. Four (4.1%) women planning out-of-hospital birth and one (2.7%) woman planning hospital birth reported previously having given birth to a premature baby.

6.2.2.2 Gestational Age

Of the women enrolled in the study 19 (17.9%) women planning out-of-hospital birth and 12 (30.0%) women planning hospital birth were enrolled after 20 weeks gestation as detailed in Table 6.38 but all were receiving midwifery care before they reached 20 weeks gestation.

Gestational Age at Enrollment by Planned Birth Setting				
Gestational Age	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)
>20 weeks	19	17.9	12	30.0
<20 weeks	85	80.2	28	70.0
20 weeks	2	1.9	0	0.0

Table 6.38

6.2.2.3 Risk Factors

None of the 145 women for whom data were available was assessed, at their initial visit, to be at high risk and the majority were assessed to be at low risk as detailed in Table 6.39.

Initial Visit Risk Assessment by Planned Birth Setting				
Risk Score	Out of Hospital		In Hospital	
	Count (n=105)	Percent (%)	Count (n=40)	Percent (%)
0	76	72.4	23	57.5
1	8	7.6	7	17.5
2	10	9.5	8	20.0
3	5	4.8	1	2.5
4	4	3.8	1	2.5
5	2	1.9	0	0.0

Table 6.39

6.2.3 Clinical Outcomes

6.2.3.1 Maternal Clinical Outcomes

6.2.3.1.1 Type of Birth

Of the 146 babies born to women in the study, 92 (86.7%) born to women who planned out-of-hospital births and 34 (85.0%) born to women who planned hospital births were unassisted spontaneous vaginal births (NSVB)

where no forceps, vacuum extraction or operative delivery occurred. Fifteen (14.2%) babies born to women who planned out-of-hospital and 7 (17.5%) who planned in hospital birth were assisted by vacuum, forceps or operative delivery as shown in Table 6.40.

Type of Birth by Planned Birth Setting				
Birth Type	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)
NSVB Cephalic	91	85.8	33	82.5
NSVB Breech	1	0.9	1	2.5
Mid-forceps	3	2.8	0	0.0
Vacuum	2	1.9	0	0.0
Caesarean	*9*	*8.5*	*6*	*15.0*
Assisted Birth	15	14.2	7	17.5

Table 6.40

6.2.3.1.2 Perineal and Vaginal Trauma

Of the 146 women in the study, 42 (39.6%) women who planned to give birth in out-of-hospital settings and 12 (30.0%) women who planned to give birth in hospital had intact perinea. Episiotomies were performed on 7 (6.6%) of the women who planned to give birth in an out-of-hospital setting and 1 (2.5%) woman who planned to give birth in hospital either by the midwife or by a physician as detailed in Table 6.41. However, with regard to the actual setting in which birth occurred midwives reported that the majority of episiotomies occurred in hospitals with 5 (62.5%) being performed in hospital, and 3 (37.5%) in an out-of-hospital setting. Details are presented in Table 6.41.

Relationship between Episiotomy and Birth Setting								
Type of Episiotomy	Out of Hospital (planned)		In Hospital (planned)		Out of Hospital (actual)		In Hospital (actual)	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)	Count (n=90)	Percent (%)	Count (n=56)	Percent (%)
None	99	93.4	49	97.5	87	96.7	51	91.1
Mediolateral	4	3.8	0	0.0	1	1.2	3	5.4
Midline	3	2.8	1	2.5	2	2.2	1	1.8

Table 6.41

In addition to the rates of episiotomy, midwives recorded data related to trauma to the birth canal. The majority of the perineal trauma consisted of first and second degree lacerations and no fourth degree lacerations were recorded as detailed in Table 6.42.

Perineal Trauma by Planned Birth Setting				
Type of laceration	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)
Minor Birth Canal Lacerations	22	20.8	12	30.0
Labial Lacerations	5	4.7	1	2.5
1st degree Perineal Lacerations	14	13.2	4	10.0
2nd degree Perineal Lacerations	22	20.8	9	22.5
3rd degree Perineal Lacerations	1	0.9	2	5.0
4th degree Perineal Lacerations	0	0.0	0	0.0
Vaginal Lacerations	1	0.9	0	0.0
Periuretheral/clitoral Lacerations	0	0.0	1	2.5
Cervical Lacerations	0	0.0	0	0.0

Table 6.42

6.2.3.1.3 Labour Stimulation

Midwives reported that labour was stimulated for 19 (18.1%) women who planned out-of-hospital births and 8 (25%) women who planned hospital births as detailed in Table 6.43.

Labour Stimulation by Planned Birth Setting				
Stimulation	Out of Hospital		In Hospital	
	Count (n=105)	Percent (%)	Count (n=40)	Percent (%)
None	86	81.1	30	75.0
Induction	5	4.7	7	17.5
Augmentation	14	13.2	3	7.5

Table 6.43

6.2.3.1.4 Epidural

Midwives reported that 13 (12.3%) women who planned out-of-hospital birth and 8 (20.1%) women who planned hospital birth received an epidural. However, as discussed in 6.1.3.1.4 these data were unreliable and would have been difficult to interpret as some women may have planned hospital birth because they wanted an epidural.

6.2.6.1.5 Ultrasound Examination and Biophysical Profile

Midwives reported that 55 (51.9%) women who planned out-of-hospital births and 21 (52.0%) women who planned hospital births received antepartum ultrasounds as detailed in Table 6.44. Only three (2.8%) women who

planned out-of-hospital births and one (2.5%) woman who planned a hospital birth were reported to have received Biophysical Profiles as detailed in Table 6.44.

Assessment of Fetal Wellbeing by Planned Birth Setting				
Number of Ultrasounds	Type of Assessment			
	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)
	Ultrasound Screen			
0	75	70.8	28	70.0
1	29	27.5	10	25.0
2	2	1.9	2	5.0
	Ultrasound Diagnostic			
0	82	77.4	31	77.5
1	22	20.8	9	22.5
2	2	1.9	0	0.0
	Biophysical Profile			
0	101	95.3	40	0.0
1	3	2.8	1	2.5

Table 6.44

6.2.3.1.6 Amniotomy

As noted in 6.1.3.1.6 no artificial ruptures of the membranes were reported.

6.2.3.1.7 Intravenous Fluid Administration

Fourteen (13.2%) women who planned to give birth in an out-of-hospital setting and 9 (22.5%) who planned to give birth in a hospital setting were reported to have received an intravenous infusion as detailed in Table 6.45.

Intravenous Fluid Administration by Planned Birth Setting				
Intravenous Fluid	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)
0	92	86.8	31	77.5
1	13	12.3	9	22.5
2	1	0.9	0	0.0

Table 6.45

6.2.3.1.8 Maternal Length of Hospital Stay

Of 106 who planned to give birth in an out-of-hospital setting, 86(81.1%) gave birth in an out-of-hospital setting and 36(90.0%) of 40 women who

planned to give birth in hospital gave birth in hospital. The average length of hospital stay, from admission to discharge, for women who planned to give birth in an out-of-hospital setting but gave birth in hospital was 51 hours and 5 minutes with a range of 1 to 110 hours. The average length of hospital stay for women who planned to give birth in a hospital setting and did so was 26 hours and 55 minutes with a range of 3 to 144 hours. Of 22 women who spent 12 hours or less in hospital 2 (10.0%) planned to give birth in an out-of-hospital setting and 20 (55.6%) planned to give birth in a hospital setting.

6.2.3.2 Neonatal Clinical Outcomes

6.2.3.2.1 Birth Weight

Of the 146 babies, 1 (0.9%) baby born to a mother who planned to give birth out-of-hospital and 3 (7.5%) born to mothers planning hospital births were classified as low birth weight, weighing less than 2,500 grams (5lbs 0 oz).

6.2.3.2.2 Apgar Score

At one minute after birth 10 (9.4%) babies whose mothers planned to give birth in an out-of-hospital setting and 3 (7.5%) babies whose mothers planned to give birth in a hospital were assessed to have Apgar scores of less than 7 and by 5 minutes the number assessed to have Apgar scores of less than 7 was reduced to 2 (1.9%) for planned out-of-hospital babies and 0 (0.0%) for planned in hospital babies as detailed in Table 6.46.

Relationship between Apgar Score and Birth Setting				
Apgar Score	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)
at 1 minute				
< 7	10	9.4	3	7.5
≥ 7	96	90.6	37	9.25
at 5 minutes				
< 7	2	1.9	0	0.0
≥ 7	104	98.1	40	100

Table 6.46

6.2.3.2.3 Admissions to a Neonatal Intensive Care Unit

Of the three babies born to participants in the study who were admitted to a neonatal intensive care unit, all were born to mothers who planned to give birth in an out-of-hospital setting.

Among all babies, 92 (86.8%) who were born to mothers who planned to have their births out-of-hospital and 29 (72.5%) babies whose mothers planned hospital births were reported to have had no neonatal complications. Fifteen (14.2%) complications, ranging from mild to severe were reported for babies whose mothers planned out-of-hospital births and 13 (32.5%) for babies whose mothers planned hospital births. The complication most commonly reported was a feeding problem. All reported complications are listed in Table 6.47. Two babies, one in each group, were born with congenital anomalies.

Neonatal Complications by Planned Birth Setting				
Complication	Out of Hospital		In Hospital	
	Count (n=106)	Percent (%)	Count (n=40)	Percent (%)
Feeding problems	6	5.7	6	15.0
Neonatal jaundice	0	0.0	3	7.5
Neonatal sepsis/infection	2	1.9	0	0.0
Congenital anomalies	1	0.9	1	2.5
Respiratory distress syndrome	1	0.9	0	0.0
Pneumothorax	1	0.9	0	0.0
Meconium aspiration	1	0.9	0	0.0
Bleeding from circumcision	1	0.9	0	0.0
Blocked tear duct	0	0.0	1	2.5
Fractured humorous related to a Caesarean birth	1	0.9	0	0.0
Group B streptococcal infection at 15 days age	0	0.0	1	2.5
Hypoglycaemia	0	0.0	1	2.5
Partial facial palsy and nerve damage to arm related to Caesarean birth	1	0.9	0	0.0

Table 6.47

6.2.4 Satisfaction Outcomes

Participants reported on the three satisfaction outcomes 1) satisfaction, 2) feeling in control and 3) postpartum mood state using the Client's Experience and Satisfaction Questionnaire (CESQ), the Labour Agency Scale (LAS) and

the Edinburgh Postnatal Depression Scale (EPDS) which are presented in Table 6.48.

Satisfaction Outcomes by Planned Birth Setting				
Outcome	**Out of Hospital (planned)**		**In Hospital (planned)**	
	Mean Score	**SD**	**Mean Score**	**SD**
Overall Satisfaction	4.87	0.482	4.77	0.627
Labour Agentry	186.25	16.454	182.56	22.116
Postpartum Depression	5.23	4.032	6.00	3.635

Table 6.48

That no statistical testing was possible due to the small numbers in some cells led to the decision to compare these results with those of the only other published evaluation of regulated midwifery conducted in western Canada and where statistical testing was possible which will be described in Chapter 8.

6.3 Summary

Overall, the results from the analysis of data for the variables of interest to this thesis were consistent with the literature, with no outstanding clinical differences being noted. A small number of statistical differences were found where comparisons were possible but statistical tests can only be considered with limited confidence due to the small size of the sample and the very small size of some of the cells.

No women were of high risk when admitted into the study and only 9% were of moderate risk. Midwives transferred or shared care for the 3% of women who had become high risk by 36 weeks gestation. Seventy-five percent of women wanted to give birth in an out-of–hospital setting when they entered the study and 62% did so.

Neither maternal nor neonatal mortality nor long term morbidity was reported for women who received midwifery care. Fourteen percent of women received an epidural, 10% had a Caesarean section and 5% had

episiotomies. Fifty- two percent of women experienced one or more ultrasounds and 3% experienced one or more biophysical profiles. Labour was stimulated for 20% of women in the study and labour stimulation was significantly related to both assisted birth and to Caesarean section alone.

Those women who were admitted to hospital experienced relatively short stays with the average stay being one and a half days. Most women who had a vaginal birth spent less than 12 hours in hospital with the average length of stay being 17 hours. Women's levels of satisfaction and feeling in control were high at 4.84 out of a possible 5 and 185.25 out of a possible 203 respectively. No relationship was found between satisfaction and type of birth or birth setting. Symptoms of postpartum depression were low at a mean of 5.41 out of a possible 30. The lower postpartum depression scores were significantly associated with the higher scores for feeling in control.

Babies born to mothers in the study were relatively heavy with an average birthweight of 3681 grams or 8lbs 2 oz and fewer than 2% still had Apgar scores of less than seven at 5 minutes after birth. Less than 1% of babies were transferred to neonatal intensive care units.

At the onset of labour 73% of women planned to give birth out-of-hospital and 27% of women planned to give birth in hospital. Women who planned out-of-hospital births were, on average, 30.35 years old and 7% were lone parents. Women who planned hospital births averaged 31.12 years of age and were all in committed relationships. The majority of women in both groups were at low risk for poor pregnancy outcomes but 11% of women who planned out-of-hospital birth and 5% of women who planned to give birth in hospital were at moderate risk.

Twelve percent of women who planned out-of-hospital births received an epidural, 8% had a Caesarean section and 7% had episiotomies. Twenty percent of women who planned hospital births received an epidural, 15% had a Caesarean section and 2% had episiotomies. Fifty-two percent of women in both groups experienced one or more ultrasounds and 3% planning out-of-hospital birth and 2% planning hospital births experienced one or more biophysical profiles.

Labour was stimulated for 18% of women who planned out-of-hospital birth and 25% of women who planned hospital birth. Those women who were admitted to hospital experienced relatively short stays with the average stay, from admission to discharge, for women who planned to give birth in an out-of-hospital setting but gave birth in hospital was 2 days and 3 hours. The average length of hospital stay for women who planned to give birth in a hospital setting and did so was 1 day and 3 hours.

Women who planned to give birth in an out-of-hospital setting scored 4.87 out of a possible 5 for satisfaction, 186.25 out of a possible 203 for feeling in control and 5.23 out of a possible 30 for symptoms of postpartum depression. Women who planned to give birth in an in-hospital scored 4.77 for satisfaction, 182.56 for feeling in control and 6.00 for symptoms of postpartum depression.

For babies born to mothers who planned to birth in out-of-hospital settings 1% was of low birth weight, 2% had Apgar scores of less than 7 at 5 minutes after birth and 3% were admitted to a neonatal intensive care unit. For babies born to mothers who planned to birth in hospital settings none was of low birth weight, none had Apgar scores of less than 7 at 5 minutes after birth and none were admitted to neonatal intensive care units.

Further discussion will be presented in Part 3, where the findings from two other Canadian midwifery model evaluations and the findings of the IMSEP evaluation, which have been presented in this chapter, will be examined in relation to each other.

PART THREE: A COMPARISON OF THE EFFECTS OF MIDWIFERY ELEMENTS AND SITUATIONAL FACTORS ON OUTCOMES IN THREE CANADIAN MODELS

Part 3 is concerned with building on the understanding gained in Part 1 and Part 2, regarding the relationship between midwifery models and outcomes by comparing the selected outcomes of three western Canadian models.

Chapter 7 describes the three Canadian models and the research conducted to evaluate them. Chapter 8 compares the selected outcomes of the three models of practice to add understanding of the complex interaction between the elements of midwifery and situational factors and their independent or combined effect on the outcomes, interventions and processes of care provided to women and their babies. This is accomplished by comparing of the effects of models when Canadian midwifery models, scoring high and low for the elements of midwifery, are implemented in the same geographic location and when the same high scoring model of midwifery practice is implemented in different geographic locations and in different birth settings.

Chapter 7: Midwifery Models in Western Canada

In the exploration of the literature and description of selected outcomes for newly regulated midwifery in Alberta presented in chapters 3 to 6, a potential relationship between birth outcomes and the elements of midwifery models was described. In addition the possibility that situational factors might affect outcomes was suggested. In order to seek further understanding of these potential relationships selected outcomes, chosen for their apparent sensitivity to models of care, were compared in three western Canadian midwifery models that were implemented in similar and dissimilar environments.

Unlike the review of published evaluations undertaken in Chapters 3 and 4, where a lack of adequate description of the models was a severe limitation to recognizing the effects of models on outcomes, the western Canadian models were well known to me, having practised in two of them and been associated with the process of implementation of the third. In addition, the intentional use of many of the same outcome measures was expected to facilitate a more effective comparison. This chapter presents and describes the three western Canadian models of midwifery and the research that was conducted to evaluate them.

7.1 The Evaluation of Western Canadian Models

The western Canadian evaluations to be scrutinized are the Randomized Controlled Trial of the Foothills Midwifery Programme (FMP) (Harvey et al., 1996, Harvey et al., 2002) conducted between 1992 and 1994, the Evaluation of the Home Birth Demonstration Project (HBDP) (Janssen et al., 2006a, Janssen et al., 2002) conducted between 1998 and 1999 and the Implementation of Midwifery Services Evaluation Project (IMSEP) (O'Brien et al., 2004, O'Brien et al., In Review) conducted between 2001 and 2003.

7.2 Western Canadian Models

7.2.1 The Foothills Midwifery Programme (FMP)

7.2.1.1 The Model

The first formal evaluation of a model of midwifery in western Canada was the evaluation of the FMP, one of the three Canadian demonstration projects. As discussed in Chapter 3, the demonstration projects were introduced into an environment where midwifery was not recognized and consequently no infrastructure or educational programmes were in place to support their practice. The FMP began in 1989 and was located in Calgary, Alberta. It was situated in a university affiliated tertiary care facility where intensive care was provided for high risk women from a large geographic area as well as low risk care for women who lived locally.

The proposal for the project was generated from the desire of a number of nurses working in the labour and delivery unit, who were dissatisfied with the obstetric nurse model of practice and desirous of providing midwifery care to the women with whom they worked. A group of influential senior administrators and physicians, who recognized the value of midwifery but felt its safety, efficacy and effectiveness needed to be demonstrated before it was formally recognized as a profession, supported the proposal and it was forwarded to the provincial government. The government approved the proposal effectively making the demonstration project the testing ground for considering whether to proceed to legislation recognizing the profession of midwifery. Following acceptance of the proposal and the granting of funding, as a perinatal clinical nurse specialist, who was a British trained midwife and active in the lobby for regulated midwifery in Alberta, I was appointed to implement and manage the midwifery project.

The nurse-midwives were selected from the hospital labour and delivery nurses, who applied to participate in the midwifery programme. The selection process was in depth, with applicants being assessed for midwifery qualifications, advanced education, communication skills, experience in labour and delivery nursing, membership in midwifery related associations and commitment to a woman-centred approach to maternity care. Selection

was made from written applications that included an essay on personal philosophy of midwifery care and personal interviews conducted by representatives of labour and delivery management, human resources and the midwifery programme. A comprehensive scoring system, designed for the purpose, was used to ensure demonstrable equity of selection for this popular project.

Selected nurses, some of whom were foreign-trained midwives and most of whom had been involved in lobbying the hospital administration to support the proposal for the FMP, underwent a ten month education programme designed and taught by me in my role as programme manager and an assistant professor from the University of Calgary, who was also a British trained midwife, to prepare them for their new role as nurse-midwives. As well as midwifery knowledge and clinical skills the programme included practicums and presentations by obstetricians, family physicians and other health care providers. Local empirical[6] midwives, although not recognized legally or by the hospital leadership, presented to the students on 'true midwifery,' which was discussed in Chapter 3, and opportunity was provided for the students to discuss and formulate a 'true midwifery' philosophy within the bounds of the situation. Successful completion of the education programme was dependent on passing a written examination and a practical examination administered by an obstetrician. After examining the curriculum, the Alberta Association of Midwives recognized successful completion of the Foothills Nurse-Midwifery Education Programme as an acceptable qualification for membership in the Association.

The FMP was implemented in stages but when it was fully implemented the nurse-midwives provided maternity care to approximately 200 low risk childbearing women per year. Nurse–midwives continued to be employees of the hospital under a special amendment to the nurse's union contract. The amendment allowed the nurse-midwives to work the flexible hours necessary to provide midwifery care while being paid for 37 1/2 hours a week. They

[6] 'Empirical' is a word commonly used in Canada for midwives who lack formalized training in preference to the term 'lay' which many midwives consider to be derogatory.

were required to keep a log of their worked hours and keep a bank of over or under worked hours. If the variance became excessive they arranged extra time off or worked extra hours to balance the banked hours. Nurse-midwives were compensated for their time on call by having their salary paid at the higher hourly rate of an assistant head nurse. Midwifery care for the project was provided by a team of six to eight nurse-midwives who in combination constituted five full time equivalents. Ultimate responsibility for all midwifery care rested with the very supportive liaison perinatologist or the obstetrician on call. The obstetrician could revoke or change a midwife decision at any time and be present when midwifery care was being provided whenever he or she wished. The level of direct supervision varied depending on the comfort of the physician with the safety of the care provided by nurse-midwives and his or her understanding regarding vicarious liability for the nurse-midwives' practice. In general, the degree to which the obstetricians directly oversaw the provision of midwifery care diminished over time as their confidence in the nurse-midwives' skills grew. By the time of the evaluation, nurse-midwives were virtually providing unsupervised care to the extent allowed by the programme protocol. However, a few obstetricians continued to oversee midwives practise to varying degrees, particularly around the time of birth.

Antenatal care was provided to women receiving midwifery care in a clinic room provided in the hospital antenatal clinic area. The perinatologist appointed as a liaison to the midwifery programme provided antenatal care to high risk women in a neighbouring clinic room and also saw midwifery clients at their first and 36 week gestation visits to assess their suitability for midwifery care and at any other time, if requested by a midwife. Clinic visits were scheduled so that women could visit with as many of the nurse-midwives as possible and a monthly "Meet the Midwives" tea attended by all midwives was held to which all women and their families were invited. All women and their support persons attended a class taught by two nurse-midwives to inform them about midwifery and having a baby attended by midwives. Early labour care was provided at home when possible but due to the nature of the programme all births were planned hospital births and,

because of the intense scrutiny the nurse-midwives felt themselves to be under and the vulnerability of the programme, nurse-midwives made extraordinary efforts to ensure that all women reached the hospital before birth occurred even when they felt the best course of action would have been to remain at home for the birth.

Nurse-midwives either accompanied the labouring woman to the hospital or met her there having notified the labour and delivery unit of their impending arrival. The on call obstetrician was notified of the woman's arrival, when birth was imminent and when the birth was successfully completed. Birth care was provided in a birthing room by the nurse-midwife on call who was assisted by a labour and delivery nurse for the duration of the birth of the baby and the placenta. When birth was uncomplicated the new mother and baby were discharged home by the midwife as soon as the placenta was delivered, the baby had nursed successfully and the nurse-midwife had completed all data entry and paperwork, usually about six hours after birth. When complications occurred care was transferred to or shared with the obstetrician on call and the mother and baby transferred to the postpartum unit. Nurse-midwives continued to visit the mother and baby at least daily for the duration of their hospital stay to provide midwifery support in addition to the ongoing care provided by hospital staff. Nurse-midwives visited the mother and baby at home after discharge as frequently and as often as necessary. The final visit at which the midwife discharged the mother and baby was scheduled for approximately 6 weeks after birth in the same clinic room as the antenatal visits.

7.2.1.2 The Research

Preparation of the proposal to evaluate the FMP did not begin until the funding for the project was secure. Consequently, by the time approval and funding for the research was achieved midwifery services were well established and women had been receiving care from nurse-midwives for more than a year.

The FMP was evaluated by a randomized controlled trial in which 194 women with low risk pregnancies who sought care by midwives were

randomly assigned to an experimental group (n = 101) or a control group (n = 93). Women who were randomized to the control group were free to seek care from any physician providing obstetrical services in the region; hence they received the standard care available. Women who were assigned to the experimental group received a full course of care from the team of nurse–midwives.

Women were recruited to the study by community wide advertizing through newspapers and posters in public health facilities (Kimberly, 1992) but, as the programme was already established, many women heard of the availability of midwifery care by word of mouth. Women who were low risk for medical complications according to the Alberta perinatal risk scoring system and who provided informed consent were eligible for the trial. Women were excluded if they had undergone Caesarean birth, were primigravidae under 17 or over 37 years of age or were at greater than 20 weeks gestation at the time of entry to the study. A total of 218 women were recruited and completed their course of maternity care between February 1992 and August 1994. An additional eight women in the nurse-midwife arm and 16 women in the physician arm were recruited but lost to follow-up for a variety of reasons (Harvey et al., 1996).

The purpose of the trial was to determine if, when maternal and newborn outcomes were compared, the midwifery programme was as effective and as satisfying to women who sought midwifery care as standard low risk maternity care available in the city. The outcome variables for the trial were maternal morbidity, neonatal morbidity, intervention rates and maternal satisfaction.

Clinical data were collected prospectively using the Nurse-Midwifery Clinical Data Set developed and tested by the Division of Research of the American College of Nurse-Midwives. Both criterion and construct validity were established (Greener, 1990). It was minimally revised, with permission, to adapt it to the Canadian setting and renamed the Foothills Perinatal Clinical Data Set (FPCDS).

Satisfaction was defined for the trial as a woman's positive perception of her experience during pregnancy, birth and the postpartum period and three tools were used to collect the data. Satisfaction data were obtained using the Labour and Delivery Satisfaction Index (LADSI) which was developed and tested for the purpose of evaluating midwifery. The developers tested the tool for reliability and validity in a pilot project and recommended that it only be used in totality due to less than optimal internal consistency (Lomas et al., 1987). The Attitudes about Labour and Delivery Experience (ALDE) was used to assess women's general attitudes towards their birth experience and was developed for a study to assess maternal role attainment and adapted to improve content validity which was subsequently found to be adequate. Both the LADSI and ALDE were administered at two weeks postpartum.

No other suitable satisfaction measuring tools were available at that time to measure women's satisfaction at other points during pregnancy or postpartum. Therefore, although tool development was not a mandate of the research, the researchers developed a short easy to administer questionnaire to measure satisfaction. The resulting Six Simple Questions (SSQ) was administered at 36 weeks gestation, up to 48 hours postpartum, two weeks postpartum and six weeks postpartum. As the SSQ has been described elsewhere (Harvey et al., 2002) and was not used as an outcome measure of interest in the comparison of Western Canadian models no further details are provided here.

All questionnaires were mailed to subjects with a return addressed envelope except the immediate post birth questionnaire which was hand delivered as soon as possible after birth by a research assistant. Outcomes for subjects were evaluated on an intent-to-treat basis.

Data analysis for categorical outcomes was carried out using Fishers exact test. Differences in rates were compared by calculating confidence limits between groups using normal approximations to the binomial and differences in means using Student's t test.

When major demographic variables were compared, the two groups did not differ significantly except for years of education with women in the midwife

group reporting 16 years (SD 2.49) of education and women in the physician group reporting 15.23 years (2.23) but this was not considered clinically significant. Statistical differences were found between groups, with the midwifery programme having more positive outcomes for Caesarean birth, episiotomy, epidural anaesthesia, ultrasound examination, amniotomy, intravenous drug administration during labour, dietary supplements, length of hospital stay and admission of infants to the neonatal intensive care unit and satisfaction. Research findings for the selected outcomes of interest will be discussed in more detail in Chapter 8.

7.2.2 The Home Birth Demonstration Project (HBDP)

7.2.2.1 The Model

The second formal evaluation of a midwifery model in western Canada was the evaluation of the first two years of regulated midwifery in British Columbia. The stipulation for this evaluation was incorporated by the Government of British Columbia into the Midwives Regulation of the Health Professions Act, which established midwifery as a self regulating profession in 1995. As the concern about whether home birth was a safe choice for pregnant women was a major reason for the requirement for evaluation, the first two years of midwifery was considered a home birth demonstration project in which all midwives were required to participate.

The midwives in the HBDP came from a variety of educational backgrounds and had previously practised in British Columbia either as a domiciliary midwife or as a member of a demonstration project team. All submitted an exhaustive portfolio of their education and experience and successfully completed a written and an oral and simulated scenario exam to be registered in British Columbia as well as proving they had conducted and attended births at home and in hospital and provided continuity of care to a sufficient number of women to be safe practitioners. Midwives who successfully met the requirements for registration in British Columbia were considered to be educated to a level equivalent to a baccalaureate degree. When the HBDP commenced 29 midwives were practising in solo practices or small groups in nine communities with the majority (69%) based in the two

major urban centres. Midwife numbers increased over the duration of the project and, in all, 58 midwives participated in the project.

Midwives in the HBDP practised according to the Canadian model of midwifery which was presented in detail in Chapter 3 and is summarized by the College of Midwives of British Columbia as shown in Figure 7.1.

British Columbia Model of Midwifery
The midwifery model of practice as developed in British Columbia is autonomous, community-based primary care, and incorporates the principles of continuity of care, informed consumer choice, choice of birth setting, collaborative care, accountability and evidence based practice. Together with the *Philosophy of Midwifery Care* and the *Code of Ethics*, these fundamental principles define the model of practice.

Figure 7.1 Source (College of Midwives of British Columbia, 1997)

All of the midwives were publicly funded through a contract with the provincial government on a per case basis and managed their own practices. Except for one small team, who had previously been part of a demonstration project, all the midwives were based in the community. Midwives all had admitting privileges to at least one hospital and provided care throughout pregnancy, labour, birth and the postpartum period under their own responsibility with no requirement for a woman or her baby to be seen by a physician at any time, although all midwives were required to have a named physician with whom they consulted when necessary. All antenatal visits took place either in the midwife's clinic or the mother's home with all mothers planning to birth at home receiving a 36-week gestation visit in their home for the midwife to assess the suitability of the home and practice finding its location. Midwives also attended the mother's home for early labour care when possible and as there was no out-of-hospital birth centre in British Columbia all births were planned for hospital or home. Births were conducted by the principal midwife either at home with a second midwife or other recognized health care professional in attendance or in a hospital with the assistance of hospital staff. Following hospital birth, mother and baby were usually transferred to the postpartum units where a midwife visited them as necessary, to write orders and provide midwifery care and ultimately discharge them, while hospital staff provided day-to-day nursing care. When

complications occurred care was either shared or transferred to a physician colleague. Except for the visits to hospitalized women, most postpartum visits occurred in the mother's home according to the protocol of the practice with a six week final visit occurring at the midwives' clinic.

7.2.2.2 The Research

The British Columbia HBDP research team were mandated by their provincial government to address the issue of the safety of the newly sanctioned option of home birth in a province where rugged geography and mixed weather conditions could present unique challenges. The choice to deliver at home or in hospital was made by the client and her midwife based on the a policy established by the British Columbia College of Midwives and was available to all women whose pregnancies were considered sufficiently low risk to fall within the scope of midwifery practice. The major purpose of the study, therefore, was to compare perinatal outcomes for planned home births with perinatal outcomes for planned hospital births. The outcomes selected for comparison included perinatal death and indicators of foetal or newborn and maternal morbidity. Satisfaction was considered separately from perinatal outcomes as the funding for the HBDP only covered satisfaction for women experiencing birth at home. An overview of the evaluation of satisfaction will be included later in this section.

A prospective cohort study was conducted in which the outcomes for all women planning a home birth attended by a midwife (n = 862) between January, 1998 and December, 1999 were compared with those for women planning a hospital birth in the same period attended either by a midwife (n = 571) or a physician (n = 743).

The study group consisted of all women enrolled in the HBDP who planned to have a home birth and met eligibility criteria for a home birth at the onset of labour. Women in British Columbia were ineligible for home birth if any of the twelve high risk conditions listed in Figure 7.2 occurred.

Home Birth Exclusion Conditions
Multiple birth
Heart disease (Class I-IV or class unknown)
Hypertensive chronic renal disease
Pregnancy-induced hypertension with proteinuria (>30 mg/dL) diagnosed AP
Insulin-dependent diabetes, either pre-existing or gestational
AP haemorrhage after 20 weeks gestation
Active genital herpes
Breech or other abnormal presentation
Gestational age <37 weeks or >41 weeks at onset of labour
More than one previous Caesarean section
Mother transferred to hospital from another facility

Figure 7.2

The first comparison group consisted of women who had their babies in hospital attended by a physician during the study period. The same exclusion criteria were applied to women in this group as to women in the home birth group. For each woman in the home birth group a comparison subject was chosen for the physician hospital group on the basis of matching for age, lone parent status, parity, and the hospital for which the midwife caring for the woman in the home birth group had privileges. The matching of hospitals allowed for the selection of comparison subjects who came from the same geographic areas with correspondingly similar climate, transportation, urban versus rural location and hospital resources.

The second comparison group consisted of women who planned to give birth in hospital at the beginning of labour and had the word "midwife" recorded on the hospital record as any type of caregiver. All eligible planned hospital births of midwives' clients that occurred during the study period were included in this comparison group. The criteria for eligibility in the study were the same for this comparison group as for the other two groups but subjects were not matched with the study group because there were insufficient numbers of planned hospital midwife attended births to do so. However, whether midwife attended women gave birth at home or in hospital they all came from the catchment areas of the hospitals where their midwives had privileges.

Data were extracted directly from the standard antenatal record, birth summary record and newborn record, which were completed routinely by all

caregivers including midwives and submitted to become part of the British Columbia Perinatal Database Registry, or from the HBDP form which was designed specifically to collect midwifery pertinent data such as rates for consultation, referral and transport to hospital. The HBDP forms were completed by caregivers and submitted in the same way as other forms or via the HBDP coordinator if the birth took place in a hospital not reporting to the provincial registry. Data were analyzed using X^2 and Fisher's exact test for categorical variables and Student's t-test for continuous variables according to the subject's planned place of birth at the onset of labour. A Bonferroni correction was applied to account for multiple variables. Maternal demographic and obstetrical variables were examined for their role as confounders of associations with the prevalence of selected adverse outcomes using unconditional, logistic regression. Odds ratios and 95% confidence intervals were computed for selected adverse on the basis of clinical importance and sufficient numbers of outcomes for a multivariate analysis.

Recognizing the limitation placed on their findings by the lack of comparative data for maternal satisfaction, the authors proceeded to use some discretionary funds available to them to add a comparison of satisfaction data from the homebirth group (n=550) and maternal midwife-attended hospital group. Data collection for the hospital group (n=108) was restricted to the last six months of the study due to the limited funding available.

A questionnaire was designed which included the Labour Agentry Scale (LAS) as the primary measure of satisfaction. It is a well validated tool to measure women's sense of personal control and is described in some detail in Chapter 5. In addition, The Client Experience and Satisfaction Questionnaire (CESQ) which asks for responses on a 5 point Likert scale to several questions related to caregivers availability and one regarding how satisfied women were overall with their childbirth experience was included. These questions were devised specifically for the study and are also described in Chapter 5. Questionnaires were distributed with preaddressed envelopes by midwives to their clients after their births with a request to return them prior to six weeks postpartum.

All groups in the study were similar for major demographic and pregnancy related variables because of the matching processes but some differences were noted for lesser variables. There were fewer nulliparous clients and higher rates of gravidity in the homebirth group than the midwife hospital group. Homebirth women were also more likely to report use of tobacco products than midwife hospital women and more use of illicit drugs than physician hospital women. Clients in the homebirth group attended more prenatal visits than either hospital birth groups' clients.

Women who planned to give birth at home at the onset of labour were less likely to have epidural analgesia, have their labours induced or augmented or have an episiotomy than women who, at the onset of labour, planned to give birth in hospital. No significant differences were found for other clinical perinatal outcomes. The mean LAS score was significantly higher for women who planned home birth at the commencement of labour than women who planned hospital birth. Overall satisfaction scores were also higher for women who planned home birth but not statistically different. Research findings for the selected outcomes of interest will be discussed in more detail in Chapter 8.

7.2.3 The Implementation of Midwifery Services Evaluation Project (IMSEP)

7.2.3.1 The Model

In Alberta, although it took seven years after the completion of the evaluation of the FMP, regulated midwifery was accepted with the autonomous, primary care, practice model that was described in detail in Chapter 3 and in 2001 registered midwives began to practise in the province. As the HBDP had included the evaluation of newly introduced regulated midwifery in British Columbia, so IMSEP included the evaluation of newly introduced regulated midwifery in Alberta making it the third western Canadian evaluation of midwifery care.

Alberta and British Columbia are neighbouring provinces and have much in common, particularly in terms of geography, climate and population distribution, although culturally and politically they are quite different.

Perhaps because of this difference Alberta has not provided public funding for midwifery. Midwives must charge their clients for their services, despite the fact that the women pay premiums for publicly funded health care service that entitles them to free maternity services provided by doctors and nurses. Midwives in the evaluation project were paid for their services from research funds, as described in Chapter 5, to ensure their services were equally available to all women who desired them during the evaluation.

The first midwives registered in Alberta came from varied backgrounds similar to those in British Columbia and were assessed for competence to practice by a similarly rigourous process. Registration became effective as soon as all legislative and administrative changes needed for midwives to be able to access all necessary resources, including diagnostic, laboratory and pharmacy services, were made and all midwives had been granted admitting privileges to at least one hospital. Confidence in the ability of midwives to provide safe and effective care remained tenuous in the province and one urban health authority only granted midwives privileges for the duration of the research and only in one hospital where 24 hour in-house obstetrician coverage was available.

Eighteen of the first midwives registered in Alberta consented to participate in the evaluation project including eight who had participated in the FMP. The remainder came from a wide variety of backgrounds in education and experience but all had practised as unregistered midwives in Alberta. One midwife was unable to obtain admitting privileges and consequently was unable to take part in the study. Two of the IMSEP researchers were also practising in the province at the time but, for ethical reasons and to avoid perceptions of bias, did not participate in the study.

The model of midwifery for registered midwives in Alberta is described in detail in Chapter 3 and was the same as that for British Columbia except that in Alberta the second attendant at a hospital birth was a midwife as well as for a home or birth centre birth, unless this was absolutely not possible. The protocol for birth centre births was the same as for a home birth except that mother and midwives went to the birth centre for the period of time that the

midwives would have attended the mother at home for a home birth. Equipment at the birth centre was identical to that taken to a home birth by a midwife. Mothers contracted with the owner and paid an additional fee to give birth in the birth centre. All of the midwives who participated in the project were based in the community and managed their own practices working either in solo practice or in teams of two or three.

As in British Columbia midwives provided care throughout pregnancy labour, birth and the postpartum period under their own responsibility with no requirement for a woman or her baby to be seen by a physician at any time although midwives were able and did consult with physicians when necessary for which physicians received a publicly funded fee for service. If a transfer of care occurred or care was shared midwives continued to provide supportive midwifery care to the women throughout their childbirth experience. All antenatal visits took place either in the midwife's clinic or the mother's home. Midwives attended mothers at home for early labour care when possible regardless of where they planned to give birth. Births were conducted by the principal midwife either at home, at the birth centre or in a hospital with back-up from a second midwife. Following hospital and birth centre birth the majority of new mothers and babies were discharged home by the midwife as soon as the placenta was delivered, the baby had nursed successfully and the midwife had completed all data entry and paperwork. A few mothers, including those with complications were transferred to postpartum units of a hospital where a midwife visited them as necessary, to write orders and provide midwifery care and ultimately discharge them, while hospital staff provided day-to-day nursing care. Most postpartum visits occurred in the mother's home according to the protocol of the practice with a six week final visit occurring at the midwives clinic.

7.2.3.2 The Research

The IMSEP evaluation was a prospective descriptive and matched-cohort study the design and methodology of which were presented in detail in Chapter 5. This thesis is concerned with a sub-study of IMSEP, Relationship between Outcomes and Midwifery Models (ROMM), which was also

described in Chapter 5. For ROMM, selected outcomes of IMSEP were reanalysed to describe the outcomes for women in the study cohort who were cared for by midwives and compare them with the outcomes for women in the matched, comparison group who received standard care from physicians and nurses.

The study and comparison cohorts were similar for the major demographic and pregnancy related variables of initial risk score, maternal age, parity, and postal code because of the matching process. It was not possible to assess the similarity between groups for other demographic variables, such as ethnicity and family income, as these data were not collected as part of the provincial record and therefore not available the comparison cohort. Satisfaction outcomes were likewise not available for women receiving physician care.

Women who received midwifery care were less likely to experience labour induction and more likely to have a baby with a higher average birthweight but no other significant differences were found for the clinical outcomes of interest in this thesis, as reported in Chapter 6. Research findings for the selected outcomes of interest will be discussed in more detail in Chapter 8.

As the focus of the IMSEP study was the integration of the new profession of midwifery into the health care system and how midwifery compared with existing maternity care it did not include any further analysis. However, since my interest was more related to the midwifery model itself and not its comparison with medical models, I reanalyzed the data for the selected outcome variables once more but this time differences between women who, at the onset of labour, planned to give birth in a hospital setting and women who, at the onset of labour, planned to give birth in an out-of-hospital setting were the focus of the comparison. An additional advantage to the in and out of hospital comparison is its match with the analysis of the HBDP.

7.3 The Comparison of Midwifery Models in Western Canada

The three western Canadian models described in this chapter were examined from an exploratory perspective in relation to each other as the

next step in the ROMM study. The purpose of the comparison was to try to gain an understanding of the effect of models of midwifery on the outcomes of interest to this thesis under different circumstances. The comparison is presented in the next chapter.

Chapter 8: Effects of Midwifery Elements and Situational Factors on Outcomes

This chapter will consider the selected outcomes from the Implementation of Midwifery Services Evaluation Project (IMSEP), which is the focus of this thesis, in relation to the outcomes of the two other evaluations of midwifery practice that have been conducted in western Canada and were presented in Chapter 7. The outcomes of the three models of practice were compared to expand and build on the work begun in Chapter 4 to tease out possible patterns or trends from the published literature on midwifery models and developed further in Chapters 5 and 6 with the analysis of the IMSEP data for the selected outcomes. This was accomplished by seeking to extrapolate some clues to understanding the complex interaction between the elements of midwifery and situational factors and their independent or combined effect on the outcomes, interventions and processes of care provided to women and their babies.

The purpose of this exercise was twofold. Firstly, further clarification of the effects of models of midwifery was sought by considering whether similarities or differences in outcomes occur when Canadian models categorized to score high and low for the elements of midwifery are implemented in the same geographic location. The strength of a model in this context refers to the degree to which it contains the elements identified as integral to the Canadian model described in Chapter 4. Secondly, clues were sought about what effects the environment may have on the selected outcomes, if any. This was a first step towards identifying potential confounders to recognising the effects of elements of midwifery practice models. It was accomplished by examining the selected outcomes when care is provided using the same model of midwifery practice in different geographic locations and in different birth settings.

8.1 Examination of Western Canadian Models

Statistical analysis was not used in this comparison of western Canadian studies but the potential impact of the three models of midwifery on the outcomes of interest under different circumstances was explored and

reflected upon. The exploration was conducted to provide a framework for a discussion of my findings from the IMSEP reanalysis in relation to other comparable studies. As in Part ,1 the use of relative words such as lesser or greater and directional words such as trend or difference are intended literally; no statistical or clinical significance is intended or implied unless specifically stated. Clinical significance was assigned on the basis of my personal clinical judgement as an experienced, practising midwife. Only findings from IMSEP data (O'Brien et al., 2004, O'Brien et al., In Review), my reanalysis of the data for ROMM and published findings for the FMP (Harvey, 1996, Harvey et al., 2002) and HBDP (Janssen et al., 2006a, Janssen et al., 2002) evaluations were used in this exploration and the tables presented in this chapter only contain data from those same sources. Lack of statistical testing is a serious limitation when exploring this outcome data for Alberta and British Columbia although the differences are so small it is very unlikely that a significant difference would be found. The details of the outcomes of interest for the three western Canadian models are presented in Table 8.1

Outcomes for FMP, HBDP and IMSEP Midwifery Models

Variable	FMP Midwife Hospital N = 101	HBDP Midwife Out of Hospital N = 862	HBDP Midwife Hospital N = 571	IMSEP Midwife Out of Hospital N =106	IMSEP Midwife Hospital N = 40
	No(%)	No(%)	No(%)	No(%)	No(%)
DEMOGRAPHICS					
Age	**Average Age** 30.26 yrs (SD 3.77)	**Average Age** Y 30.2 yrs (SD 5.4)	**Average Age** 31.0 yrs (SD 5.3)	**Average Age** 30.34 yrs (SD 4.94)	**Average Age** 31.12 yrs (SD 4.61)
Ethnicity	**Caucasian** 97 (96.1) **Other** 4(3.9)	**NR**	**NR**	**Caucasian** 98(91.5) **Other** 8(8.5)	**Caucasian** 40(100.0) **Other** 0(0.0)
Education	**Average Years** X16.0 yrs (SD .49)	**NR**	**NR**	**High School or less** 31(29.8) **More than High School** 73(70.2)	**High School or less** 7 (18.4) **More than High School** 31(81.6)
Parity	**Nulliparous** 56 (55.4) **Multiparous** 45 (44.6)	**Nulliparous** Y 402(46.6) **Multiparous** 460(53.4)	**Nulliparous** 332(58.1) **Multiparous** 239(41.9)	**Nulliparous** 38(35.8) **Multiparous** 68(65.0)	**Nulliparous** 19(48.7) **Multiparous** 20(48.7)
Initial Risk Score	**Inclusion Criteria** Risk score < 3	**Risks similar except for Mean Use of**	**Risks similar except for Mean Use of**	**Low Risk (0-2)** 94 (89. 5)	**Low Risk (0-2)** 38 (95.0)

		Tobacco Y136(15.8) Met criteria for home birth at onset of labour	**Tobacco** 60(10.5) Met criteria for home birth	**Mod Risk (3-5)** 11 (10.5)	**Mod Risk (3-5)** 2 (5.0)
Prepregnant Weight	**Mean Weight** 72. 44 Kg (SD 26.57)	**Mean Weight** YX61.7 Kg (SD11.1)	**Mean Weight** 63.9 Kg (SD11.6)	**Mean Weight** **NR**	**Mean Weight** **NR**
MATERNAL OUTCOMES					
Antepartum ultrasound	**Ultrasound** X59 (58.4)	**NR**	**NR**	**Antepartum Ultrasound** CY55(19.8)	**Antepartum Ultrasound** 21(52.0%)
Biophysical Profile	**BPP Rate** 23 (22.8)	**NR**	**NR**	**BPP Rate** 3(2.8)	**BPP Rate** 1(2.5))
Intravenous in labour	**Total IV Rate** CX27 (26.7)	**NR**	**NR**	**IV Rate** 14(13.1)	**IV Rate** 9(22.5)
Epidural	**Epidural for Pain Relief in labour** CX 13(12.9)	**Epidural for Analgesia or Anesthesia** YX66 (7.7)	**Epidural for Analgesia or Anesthesia** 105 (26.3)	**Epidural for Analgesia or Anesthesia** 14(12.3)	**Epidural for Analgesia or Anesthesia** 8(20.0)
Amniotomy	X17 (16.8)	**ARM** YX136 (15.8)	**ARM** 275(37.0)	**NR**	**NR**
Labour Stimulation	**Labour Augmentation** 14 (14.0)	**Medical** YX55 (6.4)	**Medical** 109 (19.1)	**Labour Augmentation** 14(13.2)	**Labour Augmentation** 3(7.5)
	Labour Induction 8(8.0)	**Labour Induction** YX37(4.3)	**Labour Induction** 80(14.0)	**Labour Induction** CYX 5(4.7)	**Labour Induction** 7(17.5)
Type of Birth	**Caesarean Birth Rate** X4 (4.0)	**Caesarean Birth Rate** YX55 (6.4)	**Caesarean Birth Rate** 68 (11.9)	**Caesarean Birth Rate** CY9(8.5)	**Caesarean Birth Rate** 6(15.0)
	Spontaneous Vaginal Delivery Rate X89 (88.2)	**Spontaneous Vaginal Delivery Rate** 779 (90.4)	**Spontaneous Vaginal Delivery Rate** 433 (75.8)	**Spontaneous Vaginal Delivery Rate** 92(86.7)	**Spontaneous Vaginal Delivery Rate** 34(85.0)
Perineal Integrity	**Episiotomy after C/S removed** X15/97 (15.5)	**Episiotomy Rate** YX33 (3.8) **Intact Perineum** Y474(55.0)	**Episiotomy Rate** 62 (10.9) **Intact Perineum** 252(51.3)	**Episiotomy Rate** CY7(6.6) Actual 3 of 90 **Intact Perineum** 42((39.6)	**Episiotomy Rate** 1((2.5) Actual 5 of 54 **Intact Perineum** 12(30.0)
Length of hospital stay	**Total Mean LOS** X29.0 hrs **PP Mean LOS** X21.7hrs	**NR**	**NR**	**Not Admitted** 86(81.1) **Total Mean LOS** 42.7hrs	**Not Admitted** 4((10.0) **Total Mean LOS** 30.4hrs
NEONATAL OUTCOMES					
Apgar Score	**< 7 at 1 min** X14 (13.9) **< 7 at 5 min** 4 (4)	**< 7 at 1 min** X89 (10.4) **< 7 at 5 min** 8 (0.9)	**< 7 at 1 min** 69 (12.3) **< 7 at 5 min** 3 (0.5)	**< 7 at 1 min** 10(9.4) **< 7 at 5 min** 2(1.9)	**< 7 at 1 min** 3(7.5) **< 7 at 5 min** 0(0.0)
Admission to NICU	**Total Admissions** X8 (7.9)	**NR**	**NR**	**Total Admissions** 2	**Total Admissions** 3
Birthweight	**Average Birthweight** 3502 grams	**Birthweight <2500g** 7 (0.8)	**Birthweight <2500g** 4 (0.7)	**Birthweight <2500g** 1 (0.9)	**Birthweight <2500g** 3 (2.5)
SATISFACTION					
Labour and Delivery Satisfaction Index (LADSI)	**Mean Score** X211 (SD 14.2)	**NR**	**NR**	**NR**	**NR**
Attitudes	**Mean Score**				

about Labour and Delivery Experience (ADLE)	X116 (SD 12.7)		NR	NR	NR	NR
Labour Agentry Scale (LAS)			Mean Score Y188.49 (SD16.85)	Mean Score 176.60 (SD 23.79)	Mean Score 186.25 (SD16.45)	Mean Score 182..56 (SD 22.12)
Edinburgh Postnatal Depression Scale (EPDS)					Mean Score 5.23 (SD 4.03)	Mean Score 6.00 (SD 3.64)
Overall Satisfaction with Childbirth Experience			Mean Score 4.87 (SD 0.42)	Mean Score 4.80 (SD 0.49)	Mean Score 4.87 (SD O.48)	Mean Score 4.77 (SD 0.63)

Y = significant difference between midwife groups
X = significant difference between midwife and local standard care
CY = clinically significant difference between midwife groups
CX = clinically significant difference between midwife and local standard care
Some n's may vary slightly due to missing data

Table 8.1

8.1.1. Different Strength Models in the Same Location

When it was introduced in 1998, the FMP was a model of midwifery that would have scored four for strength using the classification system developed in Chapter 4, calling into question whether it was a midwifery model and not, in fact, a modified medical model. Nevertheless, when evaluated, by randomized controlled trial, it was shown to result in significantly more positive outcomes than the existing standard care for all of the outcomes of interest and prompting their selection as outcomes for the ROMM (Harvey et al., 1996, Harvey et al., 2002). The FMP continued with discretionary funding for another four years after the completion of the evaluation as a valued programme of the hospital and in anticipation of imminent regulation and government funding of midwifery (Bell, 1994). The discretionary funding ran out in 1998 and as midwifery was still unfunded and unregulated, the FMP was discontinued and the nurse-midwives offered nursing positions in the hospital. Feeling frustrated at once again being unable to practise midwifery, the majority of the nurse-midwives continued to pursue registration and began to attend home births as independent midwives, despite the possibility of being charged with practising medicine without a license and losing their nursing licenses.

Finally, seven years after the evaluation and four years after the closure of the FMP, midwifery was regulated in Alberta, although the only funding for independent practitioners, so far, was achieved through IMSEP. The eight nurse-midwives who became registered midwives all entered IMSEP along with ten other newly registered midwives that met the requirements for registration and were obliged to practise within the Alberta model of midwifery. As described in Chapter 3, the Alberta midwifery model is considered a very high scoring model which would score ten on the classification system devised to enable an estimation of the degree to which a model contained the elements of the Canadian model. Perceiving the newer IMSEP model to contain more than twice the level of elements of midwifery as the older FMP model, I was guardedly expectant that the outcome rates for midwifery practice would be much lower for the higher scoring model. As shown in Table 8.1, my expectations were not entirely met. Although lower rates were reported for the majority of outcomes, they were far from twice as low and for a few outcomes higher rates were reported.

Particularly noticeable among instances of higher rates for maternal clinical outcomes for the higher scoring model was the higher rate for the core evaluation variable; type of birth. A six percent higher rate for Caesarean birth and a two percent lower rate of spontaneous vaginal birth were reported for women receiving care from registered midwives compared with the FMP. While this higher rate does not look large, the difference between a four percent and a ten percent chance of having a Caesarean birth is of considerable consequence to childbearing women. The possibility that the higher Caesarean birth rate may be a result of higher rates generally in the province, during the seven years between the two evaluations, is not supported. In fact, there is a 7% decrease from 15.1% to 8.7% between the rates reported for standard care in the two evaluations (Harvey et al., 1996, O'Brien et al., 2004). The Canadian national Caesarean delivery rate for all women was 17.9% in 1992 to 1993 when the FMP evaluation was conducted and 21.2% in 2000 to 2001 when the IMSEP was conducted (Canadian Perinatal Surveillance System 2003). Although the 1992 to 1993 rate has not

been published for Alberta, the 2000 to 2001 rate was 20.9% (Canadian Perinatal Surveillance System 2003). Unfortunately rates for low risk women are not available.

[A]Selected Outcomes for FMP and IMSEP Midwifery Models		
	n(%)	n(%)
	FMP Strength Score=4 n=101	**IMSEP Strength Score=10 n=146**
Caesarean section	*4 (4.0)	15 (10.3)
Spontaneous vaginal delivery	*89 (88.2)	126 (86.3)
Episiotomy	After C/S removed *15/97 (15.5)	After C/S removed 8(5.5)
Epidural	for labour 13 (12.9)	Including C/S 21 (14.4)
Antepartum ultrasound	*59 (58.4)	80(54.8)
Biophysical profile	23 (22.8)	4(0.2)
Amniotomy	*17 (16.8)	NR
Induction of labour	8 (8.0)	*12(8.2)
Labour augmentation	14 (14.0)	17(11.6)
Intravenous in labour	27 (26.7)	NR
Length of hospital stay	All women 39.5 h	Women admitted 37h 46 m
Apgar Score < 7 - **at 1 minute** - **at 5 minutes**	 *13(8.9) 4 (4.0)	 13 (8.9) 2 (1.4)
Admission to NICU	*8 (7.9)	3 (2.1)
Average birthweight (g)	3502	*≠3681
Satisfaction	LADSI Score out of 222 *211 (95.9)	CSEQ Score out of 5 4.48 (89.6)
Labour and Delivery Experience	ADLE Score out of 145 *116 (80.0)	LAS Score out of 203 185.25(89.1)
A=Table consists of data from the IMSEP reanalysis and FMP published figures (Harvey, 1996) only ***=Significant difference from standard care** **≠ =Retrospective provincial statistical data**		

Table 8.2

Another maternal outcome variable for which a higher rate was reported was the use of epidural with a two percent higher rate being reported for women receiving care in IMSEP as compared with the FMP. Unfortunately, not even a hypothetical inference can be attributed to this finding as the FMP measured epidural analgesia and the IMSEP measured a combination of epidural analgesia and epidural anaesthesia. This difference in measuring may well have accounted for the 2% difference in outcome as some of the 10% of women who had Caesarean births would, almost certainly, have had epidural anaesthesia for their surgery without having had an epidural already in place for pain relief.

The variables with the most marked lower rates for the higher scoring model were those in the neonatal outcomes category. This was very reassuring as it provided support for the claim by midwifery supporters that the inclusion of home birth, as a choice for women, did not constitute a threat to the safety of babies. If birthweight is an indicator of health, then babies born to mothers in the registered midwife model, which was categorized to score higher for elements of midwifery, appear to have been healthier as they weighed an average of 3681 grams while babies in the nurse-midwife model weighed an average of 3502 grams. However, a corresponding increase was reported in birthweight for standard care babies from 3492 grams in the FMP evaluation to 3565 grams in the IMSEP evaluation.

Admissions to neonatal intensive care units, which are a critical outcome measure in terms of the safety of newborn babies, were noticeably lower for the higher scoring model with the FMP reporting a 7.1% rate and the IMSEP reporting a 3.1% rate of admission. Apgar scores also point toward a possibility of less morbidity for babies born in the IMSEP model for although the percentages of Apgar scores were identical at one minute after birth, with 8.9% of babies having scores of less than seven, by five minutes, only 4.0% babies receiving care in the FMP model and 1.4% of babies receiving care in the IMSEP model had Apgar scores of less than seven. However, as with birthweight, a corresponding decrease was noted for standard care with five-minute Apgar scores of less than seven decreasing from 4.3% to 1.4% from the FMP evaluation to the IMSEP evaluation. It should be noted that none of the changes in Apgar score rates was tested for significance owing to the small numbers.

Episiotomy is one of very few outcomes over which midwives generally have total control as, except when a birth is managed by a physician, they perform the intervention themselves based on their own judgement, therefore, that midwives in the much higher scoring model, where home birth is an option and physician involvement is not a requirement, would perform fewer episiotomies might well be hypothesised. This proved to be the case with nurse-midwives performing three times as many episiotomies as registered midwives at 15.5% and 5.5% respectively. Knowing that the same method of

data collection, where episiotomies were recorded prospectively by the midwives in both studies and all Caesarean births were removed from the analysis, makes it possible to give slightly more credence to the findings for this variable than for some others. It is probable that the rate of episiotomy decreased overall in the period between studies as the use of routine episiotomy continued to lose favour (Klein, 2002, Weeks and Kozak, 2001) as a result of convincing research (Sleep et al., 1984). Unfortunately, although it is known that in the FMP women in the standard care group received episiotomies at a rate of 32.9%, or slightly more than twice as often as women in the nurse-midwife group, standard care rates were not available for women in the IMSEP evaluation.

Interestingly, for the two outcomes in the category of labour stimulation, the lower rates were reported for nurse-midwives for augmentation and for registered midwives for induction. For augmentation the rate for nurse-midwives was 14.0% and for registered midwives it was 11.6%. For induction the difference between rates was in reality so small as to be equivocal at 8.0% for nurse-midwives and 8.2% for registered midwives but that the rate for standard care is reported to have changed from 15.6% to 22.8% speaks in favour of the registered midwives influence in reduced induction rates, especially as this is one of only two outcomes where a significant difference ($p<0.0001$) (O'Brien et al., 2004) was reported between midwife and physician care in the IMSEP study.

The length of hospital stay was another outcome variable for which the data collection methods were known to be the same with length of stay for birth being measured in hours from time of admission to time of discharge. When the rate for only women admitted to hospital at 37 hours 46 minutes in the IMSEP study is compared with the FMP rate, a stay of 1 hour and 44 minutes less is observable for women cared for by registered midwives.

Different tools were used to measure women's satisfaction in the IMSEP study than had been used in the FMP trial; nevertheless, in each evaluation one measure of satisfaction and one measure of women's birth experience were used. The LADSI measured women's satisfaction with labour and

delivery in the FMP and the CSEQ measured women's overall satisfaction in the IMSEP as discussed in chapter 5. For women's experience of birth, the LAS measured women's perceived sense of control over their birth experience in the IMSEP and the ALDE measured women's retrospective attitudes towards their birth experience in the FMP and included six questions related directly to how in control women felt during their birth experience. It is therefore likely that these questionnaires were measuring similar emotions and, with cognizance that they were not measuring exactly the same outcomes, they were explored in relation to each other. Other measures of satisfaction used in the two studies were not explored as there were none that were similar between the two studies.

To facilitate the exploration of satisfaction and birth experience outcomes for the two evaluations, mean scores for all the satisfaction and birth experience outcomes were converted to percentages of the highest possible score achievable for the tool by which it was measured. All scores were relatively high at above 80% of the total possible score but, within the noted limitations, it appears that women are more satisfied with nurse-midwifery care as they scored at 95% of the total on the LADSI while women receiving care from registered midwives scored 89.6% for CESQ. Conversely, women receiving care from registered midwives appeared to feel more in control, with 89.1% of total score for the LAS while women receiving care from nurse-midwives scored 80% of the total score for the ALDE.

The final step in the examination of outcomes was to explore relevant demographic and pregnancy related characteristics for homogeneity of the groups and to see if any which could account for differences in the outcomes of interest, might be suggested. The details of the demographic and pregnancy related variables explored are presented in Table 8.2.

[A]Demographic and Pregnancy Related Characteristics for FMP and IMSEP Midwifery Models		
	n(%)	n(%)
	FMP Strength Score=4 n=101	IMSEP Strength Score=10 n=146
Nulliparous	56(55.4)	57(39.3%)
Age	30.26	30.55
Initial Risk Score	<3	<3=132(91.1) 3-6=13(8.9)
Education	*Mean Years 16.0 (SD 2.49)	High School =38(26.6) College =40(28.0) Degree=65(45.5)
Ethnicity - Caucasian - Asian - Aboriginal - Hispanic - Caribbean	 97 (96.1) 3 (2.8) 1 (1.1) 0 0	 137 (93.9) 0 1 2 1 Other =4(2.8)
Hx Spontaneous Abortion	14 (13.9)	24(17.6)
A=Table consists of data from the IMSEP reanalysis and FMP published figures (Harvey, 1996) only ***=Significant difference from standard care**		

Table 8.3

Overall the two groups of women receiving midwifery care appeared similar with women in both groups being just over 30 years old, of above average education and over 90% Caucasian. Possibly as a result of more repeat clients for registered midwives, as some form of recognized midwifery had been available for over ten years by the time the IMSEP study took place, more nulliparous women were reported among women receiving care from nurse-midwives in the FMP: 16.1% more women receiving care from nurse-midwives had not previously given birth to a viable baby and therefore were potentially more at risk of poor pregnancy outcomes. However, the trend towards potentially higher risk seems to be reversed for initial risk score. In the FMP evaluation all women had initial risk scores in the low category of less than three, as this was a the criterion for inclusion in the trial and each woman's low risk status was verified by a perinatologist at her initial and 36 week gestation visits. In the IMSEP study 8.9% of women had initial risk scores in the moderate range of three to six. Women in the FMP study may have been at even less risk of poor outcome than is observable from these results as women were excluded from the trial if they had previously undergone Caesarean section or were primigravidae under 17 or over 37 years of age, even if they were in the low category for initial risk. There were

no risk restrictions among the criteria for inclusion in the IMSEP study, except those imposed by provincial midwifery regulation which did not exclude women for age or previous Caesarean birth nor impose a weighted risk score limit. Generally, if a woman was at increased risk or her risk increased during her course of care, a consultation was made to a physician or her primary care was transferred. In both evaluations all data were analysed by intention to treat.

In summary, although the anticipated marked improvement in outcomes for registered midwives in the IMSEP evaluation was not observed, there was a suggestion that, generally, outcomes were slightly improved for registered midwife care in the IMSEP model. A notable exception was type of birth. Interestingly, women who received care in the IMSEP model appeared less satisfied but more in control than women receiving care in the FMP model, although the validity of this comparison is difficult to judge, as different measures were used. Neonatal outcome rates were lower for babies cared for in the IMSEP model which is supportive of the safety of newborns when homebirth is an option.

8.1.2 Same Strength Models in Different Locations

Implemented three years apart, in 1998 and 2001 respectively, the HDBP and IMSEP evaluations were similar in that both began data collection for evaluation of a midwifery model the very first day the model was introduced, unlike the FMP in which midwives had been practising in the model for well over a year before evaluation commenced. The evaluations were also similar in that the models being evaluated were both Canadian midwifery models categorized to score highly for elements of midwifery..

Despite their similarity, there were three subtle difference between the two models namely that in the IMSEP model a second midwife was called to be a back-up for hospital birth whenever possible but in the HBDP model hospital staff routinely provided back-up for the primary midwife. However, in both models a second midwife was called in to assist at an out-of-hospital birth whenever possible. The second difference was that the midwives in the HBDP were under contract to their provincial government and funded

through that contract. In IMSEP, midwives had no formal contract but were remunerated for their services via the evaluation research grant and consequently practising in a virtually independent role. Thirdly, the provincial government provided substantial subsidy for a college of midwives for HBDP midwives, even before midwives were registered, ensuring their self-governance, while for IMSEP midwives no such subsidy was provided. Instead, a committee was established within the health ministry to govern midwifery. Members of the committee represented medicine, nursing and other health care interests but the majority of voting members were midwives. Although these differences could be theorized to have the potential to affect the models, particularly in terms of the elements autonomy, continuity and, indirectly, partnership, the differences were too small to be discernable using the classification system developed in Chapter 4. The two models were therefore considered the same for the purposes of this examination of outcomes.

Although the IMSEP and HBDP models were essentially similar there were some differences between their locations. Geographically, Alberta and British Columbia are adjacent provinces in Western Canada and similar in that they are both vast and climatically and topographically extreme. Both are resource rich and major centers of the lumber and oil industries. They share the Rocky Mountains, as their border with summer and winter, mountain-related, outdoor activities being prevalent in both provinces. However, these mountains have historically been a barrier between the two populations isolating them from each other before the advent of more modern means of transportation. British Columbia borders the Pacific Ocean facilitating its status as an internationally renowned tourist destination and an active commercial and sport fishing industry. Alberta on the other hand extends into the Canadian prairies facilitating the growth of a thriving commercial agricultural industry with the prairies being known as the breadbasket of Canada and Alberta beef being recognized worldwide.

Another difference between the provinces is the attitude of the respective provincial governments towards the profession of midwifery. The slow progression of the implementation of the legislation, regulation and

infrastructure to enable the practice of midwifery in Alberta where the IMSEP model was located, bears further testament to the lack of commitment of the provincial government to promote the profession. In Alberta a strong lobby pressured the government to recognize midwifery as a health discipline by 1992, a year before the British Columbia government announced the recognition of midwifery as a health profession. Nevertheless, while the HBDP was implemented in British Columbia in 1998 it took until 2001 for the IMSEP model to be introduced into Alberta. In 2008, although the evaluations of midwifery had demonstrated the value of midwifery and it is well established in both provinces, the difference in government attitude persisted. In British Columbia midwives still enjoy financial support while in Alberta, although, funded midwifery services have been promised for 2009 (Government of Alberta, 2008), it has not yet happened. Additional evidence of stronger government support in British Columbia is a baccalaureate midwifery degree programme at a British Columbia university now enjoying its seventh year in existence while in Alberta plans for a midwifery education programme are still in their infancy with no guarantee of its eventual funding These political differences are quite likely a reflection of social differences.

I began by examining the small number of demographic and pregnancy related characteristics that were available for both models to see if any differences between the childbearing women of the two provinces would be suggested. As the HBDP evaluation results were only published for home birth and hospital birth independently, I combined the reported outcome rates for each of the outcomes of interest to obtain the rates for all women receiving midwifery care. The details of demographic and pregnancy related characteristics are presented in Table 8.3.

For the pregnancy related characteristic, parity, a difference was observable with 14.1% more women in the IMSEP group having previously given birth to a viable baby than women in the HBDP model suggesting a slightly increased risk of poor pregnancy outcome for women receiving care from midwives in the HBDP.

[B]Demographic and Pregnancy Related Characteristics for IMSEP and HBDP Midwifery Models		
	n(%)	n(%)
	IMSEP Strength Score=10 n=146	**HBDP Strength Score=10 n=1433**
Nulliparous	57(39.3)	760(53.4)
Age	30.55	30.60
Initial Risk Score	<3=132(91.1) 3-6=13(8.9)	Met homebirth criteria
Education	High School =38(26.6) College =40(28.0) Degree=65(45.5)	NR
Ethnicity - Caucasian - Asian - Aboriginal - Hispanic - Caribbean	137 (93.9) 0 1 2 1 Other =4(2.8)	NR
B=Table consists of data from the IMSEP reanalysis and HBDP published figures (Janssen et al., 2002) only ***=Significant difference from standard care**		

Table 8.4

Initial risk score might be expected to provide more information about potential differences between women in the two provinces in terms of risk but was measured differently in each evaluation. In the IMSEP evaluation, women were initially assessed by a standard provincial weighting system and given a score which was categorized as low, moderate or high risk of a poor outcome. Although the majority of women were categorized as at low risk, 8.9% were categorized as at moderate risk. In the HBDP evaluation, although an initial risk score was not reported, inclusion criteria included eligibility for home birth according to a policy of the College of Midwives of British Columbia (British Columbia Ministry of Health and Ministry Responsible for Seniors, 2000). The conditions which would preclude eligibility for home birth were similar to those which would cause women in Alberta to be assessed as at increased risk. As all the women in the HBDP were eligible for home birth it is fair to assume that all of them could be classified as being low risk of a poor outcome. This suggests that although there were more nulliparous women receiving midwifery care in British Columbia they were, if anything, at lower risk of poor pregnancy outcome at their initial assessment. No information is provided about provincial rates of initial risk as women receiving midwifery care in both studies were matched with the women receiving standard care.

Having found no hint that the women might be demographically different and conflicting differences regarding pregnancy related variables in the two models of midwifery care, I moved on to explore how the findings of the HBDP compared with those of IMSEP for the outcomes of interest. The selected outcome rates are presented in Table 8.4.

[B]Selected Outcomes for IMSEP and HBDP Midwifery Models		
	n(%)	n(%)
	IMSEP Strength Score=10 n=146	**HBDP Strength Score=10 n=1433**
Caesarean section	15 (10.3)	123(8.6)
Spontaneous vaginal delivery	126 (86.3)	1212(84.6)
Episiotomy	8 (5.5)	95(6.6)
Epidural analgesia and anaesthesia	21 (14.4)	216(15.1)
Antepartum ultrasound	80(54.8)	NR
Biophysical profile	4(0.2)	NR
Induction of labour	12(8.2)	117(8.2)
Labour augmentation	17(11.6)	164(11.4)
Intravenous in labour	NR	NR
Length of hospital stay	Women admitted -37h 46 m	NR
Apgar Score < 7 - **at 1 minute** - **at 5 minutes**	 13 (8.9) 2 (1.4)	Major congenital anomalies removed 158(11.0) 11(0.7)
Admission to NICU	3 (2.1)	Babies receiving assisted ventilation ≥ 24 h 5(0.3)
Birthweight <2500g	4(2.7)	11(0.8)
Satisfaction	CSEQ Score out of 5 4.84	Overall Satisfaction Score out of 5 4.84
Birth Experience	LAS Score out of 203 185.25	LAS Score out of 203 182.55
B=Table consists of data from the IMSEP reanalysis and HBDP published figures (Janssen et al., 2002) only ***=Significant difference from standard care**		

Table 8.5

Disappointingly, although some effort had been made to use the same data collection instruments to collect similar outcome data in the IMSEP evaluation as were used in the HBDP evaluation to begin moving towards a common data base, only six clinical and two satisfaction outcomes of interest were actually collected and analysed using the same measurement criteria. Three other outcomes were collected for both evaluations using different criteria but in a manner which was similar enough to make an exploration of them worthwhile.

For the maternal clinical outcomes of interest very little or no difference was observable between the IMSEP and HBDP models for the majority of outcomes. For type of delivery, spontaneous vaginal birth the rate was 84.6% in the HBDP and 86.3% in the IMSEP study. A Caesarean section rate of 10.3% was found for women cared for by midwives in the IMSEP, the rate for women cared for by midwives in the HBDP was 8.6%.. Also interesting to note is that for Caesarean section, although the difference between provinces is small for midwives it is comparatively marked for standard care which was reported as 8.7% in Alberta and 18.2% in British Columbia. The reason for the low rate of Caesarean section for standard care in Alberta is difficult to resolve, even for this comparatively low risk population, as national perinatal statistics for 2000-2001 give Caesarean section rates of 20.9% for all births in Alberta and 24.3% for all births in British Columbia (Canadian Perinatal Surveillance System 2003).

Due to the use of the same two instruments to measure satisfaction and birth experience, slightly more confidence is appropriate in examining these two outcomes, in these two evaluations in relationship to each other, than when examining the FMP and IMSEP evaluations. Control was measured using the LAS in both evaluations and, while the instrument is not given a name in the HBDP study, both use the CESQ to measure overall satisfaction. All scores for CESQ and LAS were high suggesting that women receiving midwife care felt satisfied and in control in both studies. There was however a suggestion that women receiving midwife care in Alberta and British Columbia felt equally satisfied with both having a mean overall satisfaction score of 4.84 out of 5 (Janssen et al., 2006a) but that women in Alberta felt more in control with a mean LAS score of 185.25 out of 202 while the mean score for women in British Columbia was reported as 182.55 (Janssen et al., 2006a).

Although, overall, very little difference was observable for explorable maternal outcomes, there is a hint of lower outcome rates for babies born to women receiving care from registered midwives in the HBDP. Birthweight is an indicator of health and one positive result of the attempts to standardize the data collection for the two evaluations is that birthweight may be

considered a more reliable indicator of newborn wellbeing. Rather than being measured as average birthweight, birthweight rates were reported as the percentage of babies with a low birthweight or weighing less than 2500 grams in both studies. While only 0.8% of babies receiving care from registered midwives in British Columbia were of low birthweight, in Alberta 2.7% weighed less than 2500 grams.

Apgar scores also support the tendency to lower rates of outcome for HBDP babies. At 5 minutes after birth 0.7% of HBDP and 1.4% of IMSEP babies had rates below seven on the Apgar scale even though at one minute 10% and 11% scored less than seven respectively. Again, however, differences in data analysis methods diminish confidence in this well recognized measurement as in the HBDP study all babies with major congenital anomalies were excluded from the analysis for Apgar scores and in the IMSEP study all babies were included. In addition, it is impossible to know without statistical testing whether these apparent differences are real or a result of chance especially as the Alberta sample is very small.

In light of the ubiquitous Canadian question about the safety of babies when births are attended by midwives I sought further clarification from the third neonatal outcome of interest in the ROMM; admissions to neonatal intensive care units. Unfortunately, neonatal intensive care admissions were not reported for the HBDP but as babies receiving assisted ventilation for 24 hours or more was, I decided to explore it as a proxy for neonatal intensive care admissions. That 2.05% of IMSEP babies were admitted to neonatal intensive care and 0.3% of HBDP babies received assistance with ventilation for 24 hours or more can in no way be considered support for a possible trend towards improved birth outcomes for babies birthed by midwives in British Columbia. Without investigating the local conditions, resources and protocols for care in more detail, it is not possible to begin to determine the reason this for apparent difference between neonatal outcomes.

In summary, overall, the outcomes were remarkably similar for the two Canadian models although the potential that neonatal outcomes may be less desirable for babies who receive care in the IMSEP model was observable.

Mothers who received care in both models expressed high levels of satisfaction and feeling in control but mothers in the IMSEP felt a little more in control.

8.1.3 Same Strength Models in Different Birth Settings

As the major goal of the HBDP evaluation in British Columbia had been to determine the safety of home birth it was natural that they should publish their findings for home and hospital births separately. In Alberta, the focus of the IMSEP evaluation was to determine the safety and issues around integration of regulated midwifery. It was not the intention in the IMSEP evaluation to study home birth per se. The results were therefore reported for midwifery in total and not separately by birth setting. Also, the sample size for the IMSEP evaluation was considered to be too small to allow for statistical testing between birth setting groups. The larger sample size in the HBDP study allowed for statistical comparison and this was made between midwife attended births planned to take place in hospital and midwife attended births planned to take place at home. Midwife attended births planned to take place at home were also compared with physician attended hospital births. The publication of HBDP results provided me with an opportunity to examine the findings of the two models, which both would have scored ten on the scale developed in Chapter 4, in relation to place of birth. If findings in both evaluations were in the same direction, greater confidence could be placed in the observed results.

Birth centre births were included in the out-of-hospital group for the ROMM analysis of the IMSEP data stratified by birth setting as the attendants and resources at a birth centre are the same as in home settings. As there was no birth centre in British Columbia, home and hospital birth constitute the equivalent of out-of-hospital and in-hospital birth. Both samples were stratified by intended place of birth at the onset of labour.

I began the examination by exploring the demographic and pregnancy related characteristics to see if there was any support for the widely held Canadian belief that women who select out-of-hospital birth are different from

women who select hospital birth. Details of the demographic and pregnancy related characteristics are presented in Table 8.5.

[B]Demographic and Pregnancy Related Outcomes for IMSEP and HBDP Midwifery Models in Relation to Birth Setting				
	n(%)	n(%)	n(%)	n(%)
	HBDP Midwife Out of Hospital N = 862	**HBDP Midwife Hospital N = 571**	**IMSEP Midwife Out of Hospital N =106**	**IMSEP Midwife Hospital N = 40**
Nulliparous	Y 402(46.6)	332(58.1)	38(35.8)	19(48.7)
Age	30.2 (SD 5.4) Y for >35yr	31.0 (SD 5.3)	30.34 (SD 4.94)	31.12 (SD 4.61)
Initial Risk Score	Met criteria for home birth at onset of labour	Met criteria for home birth	Low Risk(0-2) 94 (89. 5) Mod Risk(3-5) 11 (10.5)	Low Risk(0-2) 38 (95.0) Mod Risk(3-5) 2 (5.0)
Education	NR	NR	High School or less 31(29.8) More than High School 73(70.2)	High School or less 7 (18.4) More than High School 31(81.6)
Ethnicity	NR	NR	Caucasian 97 (91.5) Other 9(8.5)	Caucasian 40(100.0) Other 0(0.0)
B=Table consists of data from the IMSEP reanalysis and HBDP published figures (Janssen et al., 2002) only				
Y = significant difference between midwife groups				
X = significant difference between midwife and local standard care				
Some n's may vary slightly due to missing data				

Table 8.6

The size of the sample for each group of women is of interest as, in both studies, all eligible women receiving care by midwives participating in the evaluation were included. It is therefore possible to extrapolate how many women who chose midwifery care chose the out-of-hospital option in the location where the study took place. As 60.2% of women in British Columbia and 72.6% of women in Alberta planned an out-of-hospital birth at the onset of labour; out-of-hospital was clearly the most popular choice for women selecting midwifery care in western Canada, when the option was available to them.

For other demographic variables of interest, only age was consistently measured for all four groups. Women planning hospital birth at the onset of labour were an average of 31.0 years in British Columbia and 31.1 years in Alberta. Ages of women planning out-of-hospital births were also very similar in both provinces with women in British Columbia being on average 30.2 years and women in Alberta being 30.3 years. When tested in the HBDP evaluation the only statistically significant difference found for age, was for

women in the 35 years or more age group, with slightly more women in the hospital group found to be 35 years of age or more (p=0.002) (Janssen et al., 2002). The IMSEP data were not available by age group but it is reasonable to speculate that this tendency for women who are 35 years old or more to favour hospital birth is also present in Alberta.

For the demographic variables of education and ethnicity, which are only reported for the IMSEP evaluation, women in both groups appear to be well educated and predominantly Caucasian. Nevertheless, women planning hospital births tended towards more education with 81.6% being educated beyond high school compared with 70.2% of women planning out-of-hospital birth. Women planning hospital birth were also more prominently Caucasian, with 100% of women who planned hospital birth and 91.5% of women who planned out-of-hospital birth reporting their ethnicity as Caucasian. Without the support of the findings of the HBDP evaluation these differences can only be very cautiously interpreted, due to the small size of some cells, but suggest an interesting question for further research.

Parity was the only pregnancy related outcome reported in the same way for both evaluations and nulliparity was available for both. As with the demographic variables, both studies reflect the same trend, although the actual outcome rates are not as similar. Women who had not previously given birth to a viable baby were more likely to plan for a hospital birth in both provinces, although in British Columbia this was 58.1% and in Alberta 48.7%. Conversely, 46.6% of nulliparous women in British Columbia and 36.5% in Alberta chose out-of-hospital birth. In the HBDP this difference was tested and found to be statistically significant (p<0.001) (Janssen et al., 2002). That women who had previously birthed a viable child were more likely to chose an out-of-hospital birth than women who had not, makes a great deal of sense and when considered in relation to the statistically significant finding that more women over 35 years of age in the HBDP study chose hospital birth hints strongly that there is a preference for hospital birth among older nulliparae.

An 8.9% incidence of women who were moderately at risk for a poor pregnancy outcome at their initial assessment in the IMSEP evaluation was identified. I was particularly interested to see if there was a difference in the percentage of the women at moderate risk who chose out-of-hospital birth compared to the percentage that chose hospital birth. A difference was observable, with slightly more than twice as many women who planned out-of-hospital birth than women who planned hospital birth being at moderate, as opposed to low, risk of poor pregnancy outcome (10.5% and 5.0% of women respectively). No women were at high risk of poor pregnancy outcome at their initial assessment. While little reliance can be placed on this finding due to the small size of the sample, it is an outcome that could have considerable relevance when reviewing clinical and satisfaction outcomes. In the HBDP evaluation, women all met the home birth eligibility criteria and would be considered low risk, the only difference, apart from age and parity was a higher rate of tobacco use in the out-of-hospital group.

There being no other comparable demographic or pregnancy related variables the outcome variables were explored. The possibility that differences between women who planned to give birth either out-of-hospital or in hospital may be a result of differences observed between the women themselves are diminished by the use of unconditional multivariate analysis to control for several demographic variables, including age, substance use and parity for selected outcomes in the HBDP evaluation. The details for the clinical and satisfaction outcomes are presented in Table 8.6.

[B]Selected Outcomes for IMSEP and HBDP Midwifery Models in Relation to Planned Birth Setting				
	n(%)	n(%)	n(%)	n(%)
	HBDP Midwife Out of Hospital N = 862	HBDP Midwife Hospital N = 571	IMSEP Midwife Out of Hospital N = 106	IMSEP Midwife Hospital N = 40
Caesarean section	YX55 (6.4)	68 (11.9)	9(8.5)	6(15.0)
Spontaneous vaginal delivery	779 (90.4)	433 (75.8)	92(86.7)	34(85.0)
Episiotomy	YX33 (3.8)	62 (10.9)	7(6.6)	1(2.5)
Intact Perineum	Y474(55.0)	252(51.3)	42((39.6)	12(30.0)
Epidural analgesia and anaesthesia	YX66 (7.7)	105 (26.3)	14(12.3)	8(20.0)
Antepartum ultrasound	NR	NR	55(51.2)	21(52.0%)
Biophysical profile	NR	NR	3(2.8)	1(2.5))
Intravenous in labour	NR	NR	14(13. 1)	9(22.5)
Artificial Rupture of Membranes	YX136 (15.8)	275(37.0)	NR	NR
Labour augmentation	YX55 (6.4)	109 (19.1)	14(13.2)	3(7.5)
Induction of labour	YX37(4.3)	80(14.0)	X 5(4.7)	7(17.5)
Not Admitted	NR	NR	86(81.1)	4((10.0)
Apgar Score < 7 - at 1 minute - at 5 minutes	Major congenital anomalies omitted X89 (10.4) 8 (0.9)	Major congenital anomalies omitted 69 (12.3) 3 (0.5)	 10(9.4) 2(1.9)	 3(7.5) 0(0.0)
Admission to NICU	Major congenital anomalies omitted Babies receiving assisted ventilation > 24h 5(0.6)	Major congenital anomalies omitted Babies receiving assisted ventilation > 24h 0(0.0)	Total Admissions 3(2.8)	Total Admissions 0(0.0)
Birthweight <2500g	7 (0.8)	4 (0.7)	1 (0.9)	3 (7.5)
Satisfaction	4.87	4.80	4.87	4.77
Labour Agentry	Y188.49	176.60	186.25	182..56

B=Table consists of data from the IMSEP reanalysis and HBDP published figures (Janssen et al., 2002) only
Y=significant difference between midwife groups
X=significant difference between midwife and local standard care
Some n's may vary slightly due to missing data

Table 8.7

Virtually no difference was found for babies who were low birthweight in the HBDP evaluation with 0.7% of planned hospital birth babies and 0.8% of planned out-of-hospital birth babies being less than 2500 grams. However, in the IMSEP evaluation, although 0.9% of planned out-of-hospital babies were less than 2500 grams, 7.5% of planned hospital babies were reported to be less than 2500 grams. The close similarity between the rate of low birthweights at 0.7% 0.8% and 0.9% for three of the four groups suggest this may represent the real range and that the 7.5% rate can be accounted for by chance considering the small sample sizes and the very small number of low birthweight babies involved. Nevertheless, this opinion remains a guess until further research provides more robust conclusions.

There was a slight difference between studies in the way that Apgar scores were analysed with all major congenital anomalies being omitted from the HBDP evaluation but included in the IMSEP evaluation. While this needed to be taken into account when comparing Apgar Scores between studies it was not relevant when examining birth setting outcomes within individual evaluations.

For five minute Apgar scores, a better indicator of long term health outcomes than one minute Apgar scores (Casey et al., 2001), no contradiction was evident between the evaluations. In both studies, fewer low Apgar scores were found for planned hospital birth babies than for planned out-of-hospital births babies. For the HBDP 0.9% of babies whose mothers planned out-of-hospital births and 0.5% of babies whose mothers planned hospital birth had Apgar scores of less than seven at five minutes after birth. In the IMSEP study 1.9% planned out-of-hospital and 0.0% planned in hospital babies scored less than seven for five minute Apgar scores. Although no statistically significant difference (p=2.28; Adjusted OR 0.25; CI 0.59-8.80) (Janssen et al., 2002) was found in the HBDP, the incidence of low Apgar score at five minutes is extremely low in both evaluations and the possibility that larger sample sizes might show significance is noteworthy.

The other neonatal outcome of interest, admissions to neonatal intensive care, was not reported in the HBDP but the number of babies receiving assisted ventilation for 24 hours or more was available as a proxy. The finding for the need for assisted ventilation, had it been significantly different, would have clearly added support to the claim that neonatal morbidity is greater for babies whose mothers planned an out-of-hospital birth. The HBDP evaluation found that 0.0% of babies whose mothers planned a hospital birth needed assisted ventilation compared with 0.6% of babies whose mothers planned a home birth (p=0.18) (Janssen et al., 2002). Strength is contributed to the argument that planned hospital births may be safer for babies than planned out-of- hospital births in Western Canada by the IMSEP finding that 0.0% of babies whose births were planned to be in hospital and 2.8% of babies whose births were planned for out-of-hospital were admitted to a neonatal intensive care unit. Although this difference in

outcome was not tested for significance and the frequencies are very low, the higher rate of admission for babies whose births were planned for out-of-hospital adds impetus to the need to conduct more research on the question of the safety of planned out of hospital births for babies.

For the majority of maternal, clinical outcomes, a clear and consistent trend was observable. Four of the six outcomes for which data were available in the same measurement, reported lower outcome rates for women who planned out-of-hospital births at the onset of labour. For the outcome, type of delivery, a statistically significant difference was reported in the HBDP study for Caesarean birth with a rate of 6.4% for planned out-of-hospital women and 11.9% for planned hospital birth women (p=<0.001; Adjusted OR 0.66; CI 0.44-0.99) (Janssen et al., 2002). In the IMSEP evaluation, although not tested for statistical difference, the difference was of clinical significance at 8.5% for women who planned out-of-hospital birth and 15.0% for women who planned a hospital birth. While not as pronounced as for Caesarean section, the trend towards fewer interventions for women who selected out-of-hospital birth persisted for spontaneous vaginal birth. For mothers in the HBDP study the rates were not statistically different at 90.4% and 75.8% respectively and for the IMSEP study the rates were 86.7% and 85.0% respectively.

For the outcome epidural, which in both studies combined epidural for analgesia and anaesthesia, the HBDP study found a significant difference (p<0.001; Adjusted OR 0.25; CI 0.17-0.35) (Janssen et al., 2002) with 7.7% of women who planned out-of-hospital birth at the onset of labour and 26.3% of women who planned hospital birth receiving epidurals. In the IMSEP study 12.3% and 20.0% of women, respectively, received an epidural but data were known to be unstable due to inaccuracies in reporting. Similarly, for induction of labour, differences were reported which were statistically significant (p< 0.001; Adjusted OR 0.30; CI 0.20-0.46) (Janssen et al., 2002) in the HBDP evaluation with rates of 4.3% and 14.0% respectively and clinically significant in the IMSEP evaluation at 4.7% and 17.5% respectively.

For augmentation of labour and episiotomy, the remaining two variables for which comparable data were reported in the HBDP and the IMSEP

evaluations, a statistically significant difference, favouring planned out-of-hospital birth, was reported for both in the HBDP. However, a reverse relationship was observable for both outcomes in the IMSEP study. In the HBDP evaluation, augmentation of labour rates (<0.001; Adjusted OR 0.34; 95%; CI 0.24-0.51) (Janssen et al., 2002) were 6.4% for women who planned out-of-hospital birth and 19.1% for women who planned hospital birth and episiotomy rates (p<0.001; Adjusted OR 0.43; 95%; CI 0.27-0.69) (Janssen et al., 2002) were 3.8% and 10.9% respectively. In the IMSEP study, the augmentation of labour rate was 13.2% for women who planned out-of-hospital births and 7.5% for women who planned hospital birth. Episiotomy rates were 6.6% and 2.5 % respectively. Interestingly, for intact perineum, which some would argue is a more appropriate measure for midwives than episiotomy, a statistically significance difference between intact perineum rates (p<0.001) (Janssen et al., 2002) of 55.0% for women intending out-of-hospital birth and 51.3% for women intending hospital birth in the HBDP is reflected in the IMSEP evaluation. The IMSEP study reported rates of 39.6% for women intending out-of-hospital birth and 30.0% for women intending hospital birth.

In both evaluation studies, overall satisfaction was measured using the Client Experience and Satisfaction Questionnaire (CESQ) and sense of control during the birth experience, was measured as labour agentry, using the Labour Agentry Scale (LAS). Women who planned out-of-hospital births were consistently reported to be more satisfied and to feel more in control, with a statistically significant difference being reported for labour agentry (p<0.001) (Janssen et al., 2002) in the HBDP. In the IMSEP women who intended to give birth in an out-of-hospital setting had higher satisfaction and labour agentry scores than women who intended to give birth in hospital. This result is fairly convincing as not only is it consistent but, unlike when midwifery has been evaluated in earlier studies where it has been suggested that women are more satisfied who chose the option they experience, in this instance all women clearly had equal opportunity to select their preferred option.

In summary, the majority of women chose the option of out-of-hospital birth when it was a viable option and those who did so felt more in control and satisfied with their birth experience than women who chose hospital birth. In addition, maternal outcome rates were generally lower for women who chose out-of-hospital birth. For neonatal outcomes, the results were more difficult to interpret but a worrisome possible bias towards more favourable outcomes for babies whose mothers chose hospital birth was suggested.

8.2 Conclusions of the Comparison of Western Canadian Models

The comparison of western Canadian models was undertaken in the hope that more reliable interpretation of results of the evaluations examined would be possible than in the review of the published literature for two reasons. Firstly, better definition of the models examined would be possible as a result of personal knowledge of their composition and organization and secondly, more standard ways of measuring the outcome variables of interest would enable more reliable comparisons as a result of concerted efforts by researchers to work towards achieving more comparable datasets in western Canada. Although this hoped for result was only partially achieved, the examination proved valuable in adding to the understanding of elements of the Canadian midwifery model and identifying ways to improve the collection of outcome data that can confidently be compared between studies.

8.2.1 Models

In the first case, it was elucidated that knowledge of the details of a model's composition is essential for accurately determining the elements of which it is composed and their combined strength. This was achieved by examining the outcomes for the FMP and the IMSEP models, two different models that were introduced into the same location. The models were assessed to have a strength difference of six by the classification system developed for the purposes of this thesis and described in Chapter 3. The exploration of the outcomes of the two models did not show the clear trends towards improved outcomes for the higher scoring model that were anticipated based on the review of the published literature presented in Chapter 4 and my own guarded expectations. The direction of the differences in outcome rates

between the two models was varied enough that no obvious overall advantage in outcomes was observable for either model. Although women cared for in the IMSEP model appeared slightly more at risk of poor pregnancy outcome and more women cared for in the FMP model were first time mothers, these differences did not seem sufficient to have been responsible for the apparent lack of clearly improved outcomes overall for the IMSEP model and were, in any case, in conflict with each other.

Five midwives who had practised in the FMP and IMSEP models and attended a small, informal focus group, held as the ROMM was approaching completion to establish whether their perceptions were congruent with the ROMM findings, also identified several aspects of the FMP programme itself which had made it easier for them to support women's choices and provide good midwifery care. These were knowing the nursing staff and having a working relationship with them from before the programme was introduced; the presence of a labour and delivery unit manager who supported midwifery and a family–centred style of care; the education programme that gave nurse-midwives confidence in their midwifery skills and to "call yourself a midwife"; and a midwifery manager to defend and support the nurse-midwives and "deal with the politics".

The qualitative data for the IMSEP study had shown that midwives felt that the evaluation period was not long enough for them to become comfortable with their new role and the different kind of client for whom they were caring. Midwives in the informal focus group particularly identified maternal age of first time mothers, breech presentation and previous Caesarean sections as more prevalent risk factors in current client populations.

One additional finding of interest from the examination of the FMP and IMSEP models was the finding that, although maternal outcome rates were mixed, all neonatal outcomes appeared to show lower outcome rates for babies in the IMSEP study. Although only birth weight is known for standard care in the IMSEP evaluation midwifery babies were significantly heavier ($p=0.032$) (O'Brien et al., 2004) than standard care babies. However, in the FMP evaluation, midwifery babies were reported to have lower rates than

physician babies for all neonatal outcomes at a statistically significant level. As out-of-hospital birth was only available in the IMSEP study this finding not only supports the suggestion found in the published literature that midwifery care is safe for babies but also supports the claim of Canadian midwifery advocates that out-of-hospital birth is as safe or safer than hospital birth when attended by registered midwives. The results of women's feelings about their birth experience were mixed. Women receiving care from nurse-midwives reported higher levels of satisfaction with their care while women receiving care from registered midwives reported higher levels of feeling in control. This suggests women receiving care from midwives practising in their own right in the community feel more in control than women who receive care from nurse-midwives who practice by delegation in a hospital based pilot project.

8.2.2 Methods

The work at standardizing outcome measures between Alberta and British Columbia was successful to a certain degree and improved over time as researchers recognized the value of comparable data. A notable example of this was the outcome variable, birthweight. In the first evaluation of the FMP, mean birthweight was used as the outcome measure. This was useful to the degree that bonnie babies are generally regarded as healthy babies but it gives no indication of how many babies are too heavy or not heavy enough to be considered healthy. In the next evaluation, which was the HBDP, birthweight was measured categorically as less than 2500 grams, more than 5000 grams or between 2500 and 5000 grams with the latter being considered the range for a healthy birthweight. In the third, IMSEP study, we followed the lead of the HBDP researchers and used the same birthweight measure, resulting in a very useful, comparable measurement outcome for these two studies enabling the rate of unhealthily small babies to be compared between models of midwifery with more confidence than if different measures had been used. The differences were not tested for statistical significance.

Another clear example of how researchers were able to work cooperatively to achieve comparable outcome measures was for women's childbirth experiences. At the time of the first evaluation in Alberta, we used the only two tools to measure women's experience of childbirth that were available: specifically, a measure of satisfaction with labour and delivery (LADSI) and a measure of women's perception of their labour and birth (ALDE). By the time we were preparing for the IMSEP study seven years later, attempts at consistent measurement of satisfaction by using the same instrument were thwarted as the tool used to measure satisfaction in the FMP trial (LADSI) had been shown to be inadequate (Shearer, 1987) and had fallen out of favour prompting us to reject it for further use. As a part of our search for a replacement measure of satisfaction, we contacted the researchers who were preparing a proposal to evaluate the HBDP in British Columbia (Gale, 1997). Serendipitously, having experienced a similar lack of available tools, they were in the process of developing a tool for use in their evaluation, which they were willing to share. The discovery that the British Columbia researchers were also planning to use a Canadian developed instrument to measure labour agentry (Hodnett and Simmons-Tropea, 1987), the author of which we were already in contact with in regard to possibly using the labour agentry tool in the IMSEP, strengthened our decision to use it instead of the perceptions of labour instrument used in the FMP evaluation. Thus, although the tools used to measure women's childbirth experiences in FMP were similar enough with those used in IMSEP for them to be considered in relation to each other, a great deal more confidence could be placed in the comparison of women's experiences of childbirth between IMSEP and HBDP evaluations where the same tools were used.

Although researcher collaboration resulted in some improvements to the comparability of outcome data between studies, the examination of western Canadian evaluations pointed out a number of instances where no comparison between models was possible for some of the outcomes of interest. This included ten occasions where no data were reported for an outcome of interest in one or more studies. Reasons why data were not reported were that they were intentionally omitted and that problems were

encountered related to data collection. In addition, there were 12 instances where differences in how outcomes were measured diminished the confidence with which they could be compared between models. These differences ranged from being as subtle as whether Apgar scores included babies who had congenital anomalies or not to as severe as the use of completely different tools to measure overall satisfaction.

8.2.3 Situational Factors

As well as seeking information about elements of midwifery models and interpreting results of evaluations of models this examination of western Canadian models sought clarification of the effects of other factors which might affect the outcomes of midwifery care. The first step toward this goal was to examine the outcomes of two models of the same strength when they were implemented in different geographic locations. The most interesting finding was that the overall outcomes for the two models of midwifery, both of which scored ten for strength on the classification system devised for this thesis and described in Chapter 4 and were implemented in adjacent provinces were very similar. The similar rates for clinical outcomes in the evaluation of two models precluded any speculation about the effects of the identified differences between the provinces on outcomes. Interestingly, however, although women were reported to feel very positive about their birth experience in both provinces, women in Alberta reported higher levels of feeling in control.

Lack of differences in clinical outcomes between childbearing women in the two provinces did nothing to add to our knowledge of effects of factors, other than the strength of the elements of the model, on the outcomes of interest. This suggests that the influence of the overall healthcare organization, which was very similar, was more pertinent than the minor differences between the two provinces. The very similar results in the two evaluations examined hints at the possibility that the next-door neighbour provinces are more similar to each other than they are different and those differences that were identified were either not factors that influence the outcomes of midwifery or their influence is insignificant enough that it can be buffered by the influence of a

midwifery model which is categorized as scoring very highly for the elements of midwifery. From a perspective of planning to implement new models this is interesting in that the most noticeable differences between provinces was the amount of support provided by the provincial government which may not be as relevant to the implementation of midwifery models, which are categorized as scoring highly for elements of midwifery, as might be expected. More than anything, the similarity found for the outcomes of two equally scoring models in terms of the elements of midwifery they contain supports the theory, hypothesized in Chapter 4, that the difference between the degree to which models contain the elements of midwifery is directly related to differences between the models for selected outcomes.

The final goal of the examination of western Canadian models was to seek understanding of how the setting a woman planned to give birth in might have an effect on the outcomes of interest. To this end, the differences between outcomes for planned hospital and planned out-of-hospital births were examined for the Canadian model of midwifery that had been introduced into two adjacent provinces. The out-of-hospital setting was the most popular choice for women choosing midwifery care in western Canada, when a real choice was available to them, with the majority of women planning to give birth at home or in a birth centre in British Columbia and Alberta. This finding appears to support the suggestion found in the published literature discussed in chapter 3, that where home birth rates are low, the choice of home birth may not be as available as it is alleged to be.

Interestingly, there appeared to be some differences between women who chose to give birth in hospital from those who planned to give birth in an out-of-hospital setting. Women planning hospital birth appeared, on average, to be older and more likely to be having their first baby. A breakdown of these findings suggests that the increased average age may have been the result of more women having their first babies when they were over 35 years old choosing to go to hospital for birth. Women who chose hospital birth also appeared to be more predominantly white and to have more years of education. On the other hand, there was a suggestion that women who

chose out-of-hospital birth may have been at slightly increased risk of poor pregnancy outcome, possibly associated with unhealthy lifestyle behaviours.

An overall trend towards lower outcome rates for women planning out-of-hospital birth was clearly observable form the examination of the HBDP and IMSEP outcomes stratified by intended birth setting at the onset of labour. As well as improved intervention and morbidity outcomes women who intended to give birth in an out-of-hospital setting were more satisfied with and felt more in control of their birth experience than women who planned birth in a hospital setting. Whether there is a relationship between the apparent differences in outcomes and the apparent differences between the women who select the different birth settings cannot be determined from this examination. However, it is heartening for supporters of out-of-hospital birth that there is clearly no support for the claim that women who elect to give birth at home put themselves at risk

In the case of neonatal outcomes the evidence that women planning an out-of-hospital birth do not put their babies at greater risk of poor outcomes is not nearly as evident as for maternal outcomes. The examination of the IMSEP and FMP model neonatal outcomes, while no statistically or clinically significant differences were found, suggested more desirable outcomes for babies when home birth was available than when it was not ,

All outcome rates were within an acceptable range which would not suggest safety was compromised for babies, when the IMSEP and HBDP, which both included the option of out of hospital, were compared. However, there appears to be a possibility of lower neonatal outcome rates when mothers plan to give birth in hospital. In both evaluations the incidence of low Apgar scores at five minutes after birth is higher for babies whose mothers planned to give birth in an out-of-hospital setting. No statistically significant difference was found for this difference in five minute Apgar scores but as the frequencies in both studies were very low the possibility that significance may have been detected with larger samples cannot be ignored. A small degree of support for this possible trend toward lower outcome rates for babies whose mothers choose hospital births comes from two outcome

accurately classify models in unique circumstances. The comparison also showed that, by working together to standardize outcome measures, researchers could greatly improve the ability to aggregate data from different studies in a common database.

The comparison of western Canadian studies is the final part of the ROMM study and together with the first two parts will be summarized, discussed and reflected on in Chapter 9. In Chapter 10, the final chapter, the conclusions of the ROMM study will be formulated and the implications for midwifery practice and research offered.

REFLECTIONS AND CONCLUSIONS

Chapter 9: Reflections and Discussion on the Relationship between Outcomes and Midwifery Models

9.1 Summary of the Background to the Relationship between Outcomes and Midwifery Models

Alberta was the second province in Canada to recognize midwifery with legislation, it having been recognized in Ontario two years previously. One year after Alberta, another province, British Columbia, legalized midwifery and since then midwifery has grown and its recognition spread across Canada with seven provinces and one territory having passed legislation to regulate midwifery by 2009 (Canadian Association of Midwives, 2009).

Although midwifery has only recently become recognized legally, it has been practised in Canada from time immemorial. However, since the adoption in the early 20th century of medical management of childbirth in hospital as the accepted model for childbearing women, midwives' practice has been reviled by medical authorities and, of necessity, covert. The tentative and gradual recognition of midwifery as an acceptable health profession is a result of an international movement to a more natural lifestyle in general and a more physiological approach to childbirth in particular.

In Canada, the introduction of midwifery demonstration projects helped pave the way to the acceptance of midwifery by successfully demonstrating the efficacy and efficiency of midwifery under controlled circumstances in hospital (Harvey et al., 1995). Midwives and their supporters, who believed true midwifery was autonomous and included choice of birth setting, conducted a strong and successful lobby against considerable opposition from the medical establishment to ensure these elements were included in the model of midwifery recognized in Canada. Even after the legislation was enacted it took six years to assess and license midwives in Alberta (Ogle, 1998) and a further two years to complete the necessary secondary legislative and infrastructure changes for them to begin practising as registered midwives (Walker, 2000).

To evaluate the new discipline of midwifery and its integration into the Alberta health care system the Implementation of Midwifery Services Evaluation Project (IMSEP) was commissioned by the provincial government (O'Brien et al., 2004, O'Brien et al., In Review). The IMSEP evaluation was the catalyst for this doctoral dissertation; the Relationship between Outcomes and Midwifery Models (ROMM).

The ROMM consists of three parts; a review and exploration of relevant literature related to the evaluation of models of midwifery; a reanalysis of a part of the data collected for the IMSEP for selected birth outcomes and a comparison, for the same selected birth outcomes, of the evaluations of three models of midwifery implemented in Western Canada (Harvey et al., 1996, Harvey et al., 2002, Janssen et al., 2006a, Janssen et al., 2002, O'Brien et al., 2004, O'Brien et al., In Review). The three parts of the ROMM were not conducted in strict sequential order and often overlapped. In addition, as the ROMM drew towards completion, a small informal focus group was conducted with practising Alberta midwives to add context and assist with interpretation of the ROMM findings.

The overall aim of the ROMM was to seek and explore the relationship between midwifery and the birth experiences of women. More specifically, it sought understanding of what midwifery is, how it differs from model to model, how various models may affect women's birth experiences differently and what role situational factors play in the birth experiences of women receiving midwifery care. Eleven birth variables, which appeared to be particularly sensitive to models of care (Harvey et al., 1996), were selected to provide focus for the study.

The findings of the study, the value of the classification and visual representation processes used in the study and the study's strengths and limitations, are summarized, reflected upon and discussed in the remainder of this chapter. In chapter 10, the final chapter, conclusions from the ROMM, its relevance for the midwifery profession and the practice of midwives together with recommended directions for future research are presented.

9.2 Summary of the Findings of the ROMM Study

9.2.1 Part 1: Literature Review and Exploration of the Relationship between Models of Midwifery and Birth Outcomes

In Part 1, a detailed literature review was presented and the elements that make up the Canadian model of registered midwifery were identified as 'Partnership', 'Continuity', 'Autonomy', 'Community' and 'Choice'. In addition, a system of classification was developed within which the strength of a model is measured based on the degree to which it contains each of the elements. Using the classification system, the strength of a model was measured by assigning a score of 0 to 2 for each of the elements it contained with 0 representing absence of the element, 1 representing partial inclusion and 2 representing inclusion of the complete element. Total strength could range from 0 to10. A model which scored 10 was considered to be equivalent to the Canadian registered midwifery model from which the elements were extrapolated and to contain a high level of all elements. The term authentic midwifery is used in this thesis for this model as no consistently used generic term was found in current literature or modern common parlance. As expected, no model in the exploration of the literature had a total score of 0 as a 0 scoring model would be equivalent to the Canadian medical model in which all care was provided by doctors and nurses and that the majority of care was provided by midwives was a criteria for inclusion in this exploration of models. The degree to which a model of midwifery is authentic, therefore, is considered to be a continuum with medical models at one end and authentic midwifery models at the other as represented in Figure 9.1.

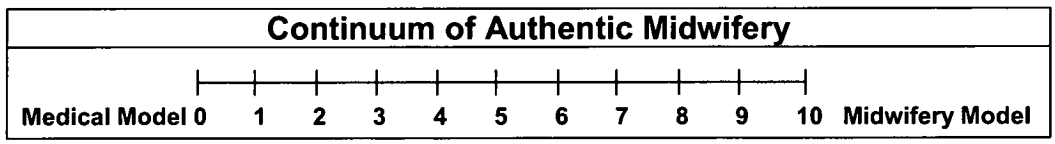

Figure 9.1

Consistent with these findings, dichotomous ideologies of a medical and a social model, which are equivalent to obstetrical practice and midwifery practice, have been identified by sociologists (van Teijlingen, 2005). However, although ideologically dichotomous, a whole range of combinations

of the two ways of operating occur in practice (van Teijlingen, 2005).This range of combinations appears to parallel the continuum of authentic midwifery generated in the ROMM dissertation.

The classification system and a series of visual representations were used to explore the published results of the evaluation of 30 midwifery models to seek potential relationships between the elements of midwifery and the selected childbirth outcomes. The patterns visible for individual pairs of models in the exploration of the literature suggested that although the strength of a model alone did not appear to be strongly related to the quality of outcomes, the difference between the strengths of a pair of models being compared with each other might be. The visual representations further suggested that other factors, particularly case mix but also where and when the midwifery was practised might influence birth outcomes. In retrospect, it is noted that recent research (Todd et al., 1998) suggests that caseload size may also affect outcomes but at the time the visual representations were originally developed caseload size was not identified as a possible confounding factor. To further explore the potential relationship, the difference between the strength of the models in each pair was represented in a way which effectively controlled for the effects of extraneous variables. When represented in this way aggregate outcome rates were lower in favour of the model in a pair which had been categorized to score more highly for midwifery elements. The two model pairs with the lowest difference in strength had 0 differences and the differences between their aggregate outcome rates were 2 and 13. The models with the greatest differences in strength of 3 and 4 also had the greatest aggregate rate differences of 28 and 59. The remainder of the model pairs fell between these two extremes in an obvious pattern of increasing levels of strength directly related to increasing levels of difference in outcome rates. This very interesting observation that a difference between the strengths of the model pairs, rather than the actual strength of the models, may be related to differences in outcomes suggests the hypothesis that authentic midwifery has an effect on women's birth experiences and that the higher the model is categorized to score in terms of the elements it contains the more beneficial the effects.

However, the inability to demonstrate the presence of the relationship without separating the models from confounding variables suggests factors that are external to the model of midwifery may also affect outcomes of the birth experience for women who receive midwifery care. A plausible explanation for this apparent phenomenon would be that contextual factors affect birth outcomes but that midwifery can influence the birth outcomes of women concomitantly with the effects of contextual factors. As a result, women's actual birth experiences would be influenced by a combination of midwifery elements and contextual factors.

9.2.2 Part 2: Description of Selected Outcomes of Regulated Midwifery in Alberta, Canada

In Part 2, the first 146 women who received a full course of care from Albertan registered midwives, following their legal recognition as a health discipline, were studied in the comprehensive IMSEP evaluation, data from which were reanalyzed for the ROMM. As a part of the reanalysis, data for selected outcomes was stratified by the birth setting planned for by women at the onset of labour, which had not been included in the original IMSEP analysis but was considered an important situational factor in the ROMM study. As described in Chapter 5, IMSEP was a prospective, descriptive study of a volunteer cohort. The outcomes to be explored in relation to the Albertan model of registered midwifery were identified as Type of birth, Labour stimulation, Epidural, Episiotomy, Apgar score, Neonatal Intensive Care admissions and Maternal satisfaction. At the onset of labour, 106 women planned to give birth in an out-of-hospital setting and 98 (92.5%) actually did so and 40 planned to give birth in hospital and 36 (90%) actually did so.

Descriptive statistics for selected outcomes by intended birth setting at the onset of labour and for all women, which were presented in detail in Chapter 6, are summarized in Table 9.1.

Summary of Reanalysed Selected Outcomes of IMSEP			
Outcome	**Planned Out-of Hospital Births**	**Planned Hospital Births**	**All Births**
NSVB	86.7%	85.0%	86.3%
Intact Perineum	39.6%	30.0%	33.0%
Labour Stimulation	18.1%	25.0%	19.8%
Epidural	12.3%	20.1%	14.4%
Ultrasound	29.2%	30.0%	29.4%
IV Fluids	13.2%	22.5%	15.8%
LOS	27 hrs	51 hrs	38 hrs
5 min Apgar < 7	1.9%	0.0%	1.4%
Birthweight < 2,500 g	0.9%	7.5%	2.7%
NICU Admits	2.8%	0.0%	2.1%
Satisfaction	4.87	4.77	4.84
Control	186.25	182.56	185.25
EPDS	5.23	6.00	5.41

Table 9.1

The findings support the claim that midwifery is a safe option for women and babies and is satisfying to women, whether they plan to give birth in hospital or in out-of-hospital settings, when care is provided by registered midwives in Alberta. However, although safe in all settings, the ROMM findings tend towards more desirable outcomes for babies whose mothers planned hospital births, although no statistical testing was carried out because of the small size of the samples.

The IMSEP evaluation consisted of two other parts which were relevant to the ROMM study; a comparison with a group of matched controls using routinely collected provincial data and a qualitative study of stakeholders using interviews and focus groups. Results from these two parts of IMSEP confirmed the safety of the midwifery care when compared with care provided in the medical model and attested to the satisfaction of women with the care they received from midwives (O'Brien et al., 2004).

9.2.3 Part 3: A Comparison of the Effects of Midwifery Elements and Situational Factors on Outcomes in Three Canadian Models

In Part 3, the results of the published evaluations of three western Canadian models, the Foothills Midwifery Programme (FMP) (Harvey et al., 1996, Harvey et al., 2002), the Implementation of Midwifery Services Evaluation Project (IMSEP) (O'Brien et al., 2004, O'Brien et al., In Review) and the

Home Birth Demonstration Project (HBDP) (Janssen et al., 2006a, Janssen et al., 2002); were compared. A summary of the findings for selected outcomes in the three evaluations, which were presented in detail in Chapter 8, is presented in Table 9.2.

*Summary of Outcomes for Three Western Canadian Models							
	FMP Strength Score=4	IMSEP Strength Score=10			HBDP Strength Score=10		
Outcome	All Births	Out-of Hospital Births	Hospital Births	All Births	Out-of Hospital Births	Hospital Births	All Births
Caesarean Section	4.0%	8.5%	15.0%	10.3%	6.4%	11.9%	8.6%
NSVB	88.2%	86.7%	85.0%	86.3%	90.4%	75.8%	84.6%
Episiotomy	15.5%	6.6%	2.5%	5.5%	3.8%	10.9%	6.6%
Epidural	12.9%	20.0%	12.3%	14.4%	7.7%	26.3%	15.1%
Induction	8.0%	4.7%	17.5%	8.2%	4.3%	14.0%	8.2%
Augmentation	14.0%	13.2%	7.5%	11.6 %	6.4%	19.1%	11.4%
5 min Apgar < 7	4.0%	1.9%	0.0%	1.4%	0.9%	0.5%	0.7%
Admission to NICU	7.9%	2.8 %	0.0%	2.1%	Assisted ventilation 0.6%	Assisted ventilation 0.0%	Assisted ventilation 0.3%
Birthweight	Average 3502 g	< 2500g 0.9%	< 2500g 7.5%	<2500g 2.7%	<2500g 0.8%	<2500g 0.7%	< 2500g 0.8%
Satisfaction	95.9%	97.4%	95.4%	96.8%	97.4%	96.0%	96.8%
Labour and Delivery Experience	80.0%	91.7%	89.9%	91.3%	92.9%	86.9%	89.9%
*All results are by intention to treat according to planned place of birth at labour onset							

Table 9.2

Overall, the comparison of western Canadian studies further supported the claim that midwifery is a safe option for childbearing women and babies. It was clear that when out-of-hospital birth is readily available as an option the majority of women who choose midwifery care will choose it but they may exhibit different characteristics from women who choose to give birth in hospital. The comparison also supports the claim that planned out-of-hospital birth attended by a registered midwife is as safe as planned hospital for women; however, as with Part 2, a suggestion that planned hospital births may result in more positive outcomes for babies was present. Again no statistical evidence was reported for this finding and, as in other studies of neonatal outcomes, the incidences are so small that conclusive evidence is not obtainable.

In addition to the clinical outcomes in Part 3 possible differences in the characteristics of midwives who practise in unique models, the length of time

a model has been established, the supportiveness of the infrastructure and the quality of midwifery education programmes were all identified as possible factors that might impact on the effectiveness of midwifery care.

9.3 Discussion of Findings

In total, the ROMM identified and defined five elements of midwifery models and four situational factors which could potentially affect the birth experiences of women. These elements were initially identified on the basis of the formal definition of the Albertan (Canadian) model of midwifery, which were then modified in the light of detailed review of the literature on models of midwifery.

9.3.1 Elements

9.3.1.1 Partnership

When the models from the literature review were classified for partnership, only one model was found to contain a low level of the element. The remaining models were equally split between containing moderate and high levels of partnership. This distribution, with partnership almost universally moderate or high supports, partnership's position as a central element of midwifery as some of the models were low in overall strength as authentic midwifery models. The almost universal presence of partnership in models of midwifery supports the feminist hypothesis that the partnership in midwifery reflects a style of communication associated with women (James, 1997) but may also be a result of an overstatement of how well partnership actually worked or was able to be present in practice. That one model showed almost no partnership content is most probably a limitation of the classification system.

9.3.1.2 Continuity

When the models from the literature review were classified for continuity, a different distribution was present than for partnership. For continuity the distribution for models of low and moderate levels of the element was similar with only half as many models being at a high level. This more equal distribution in which a higher number of models had low or moderate levels

variables, each of which was only measured in one of the evaluations. In the HBDP evaluation, no planned hospital birth babies needed assisted ventilation for more than 24 hours but 0.6% of planned out-of-birth babies did. In the IMSEP evaluation no planned hospital birth babies were admitted to neonatal intensive care but 2.8% of planned out-of-hospital birth babies were. As for Apgar scores these differences were too small to be significant but there is a persuasive consistency to the direction of the trend towards lower outcome rates for babies of women who choose hospital birth across these neonatal outcomes. While this examination of evaluations can in no way be said to provide evidence to support the claim that planned out of hospital birth is unsafe for babies neither does it provide evidence to refute the claim. What is clear is that many questions about the safety of home birth for babies have still to be answered conclusively.

8.2.4 Combined Findings

Overall the comparison of western Canadian studies supports the growing body of research, explored in Part 1, which defends the claim of midwifery to be a safe option for childbearing women and babies. By using findings from the two western Canadian studies a first step is taken in filling a gap in the existing literature by comparing outcomes when birth is planned in hospital and out-of-hospital settings. That planned out-of-hospital birth attended by a registered midwife is as safe as hospital for women is supported; however, there is a suggestion that planned hospital births may result in lower outcome rates for babies. From the comparison, it is clear that when out-of-hospital birth is readily available as an option the majority of women who seek care from midwives will choose it but may exhibit different characteristics from women who choose to give birth in hospital.

In terms of conducting research related to models of midwifery, the comparison of western studies clearly supports the need for clear description of the models studied and the usefulness of a system of classification when the effects of models on outcomes is being studied. However, it also showed that the system of classification developed for the ROMM, while able to predict the strength of models in general, lacked enough sensitivity to

of the element does not support the presence of a close relationship between continuity and partnership, which had a majority of moderate to high levels, if it is an accurate representation of reality. However, the most likely explanation for the seeming discrepancy is the superior definition and measurement of continuity than partnership in the models studied.

9.3.1.3 Autonomy

That midwifery is a profession which is by definition autonomous but in reality is less than fully autonomous was reflected when the models from the literature review were classified as all but two models contained a moderate level of autonomy. Of the two models that did not contain moderate levels of autonomy, one contained low levels of autonomy and was also the lowest scoring for the combined elements of authentic midwifery and one contained high levels of autonomy and also contained the highest levels of combined elements. This distribution suggests that autonomy may be a more important element of midwifery than it is currently recognized to be and that there is a need for its components and their effect on birth outcomes to be better understood and measured.

9.3.1.4 Community

When classified for community the distribution of strength was relatively evenly split between high, moderate and low for the models reviewed. This distribution corresponds with the very wide variety of combinations of where care was provided and how collaborative midwives were with other members of the heath care team in the models studied. However, again clearer description of the community element in the models evaluated would have provided more reliable classification.

9.3.1.5 Choice

Only four models contained a high level of choice while 20 models contained low levels. This distribution of strength in the element of choice when models were submitted to the classification process supports the hypothesis that although midwives support women's right to choice, the real choice women enjoy may be limited. Although not observable from these numbers much of

the lack of the choice element was a result of the unavailability of home birth as an option.

9.3 2 Situational Factors

9.3.2.1 Country of Study

Country of study was defined as the country in which a model was established. It was hypothesised that the culture and existing heath care system of a country may impact on the way midwives practise and indirectly on the outcomes of that care. From the visual representation no obvious differences between countries were discernable. All countries represented appeared to have a wide range of all outcome rates across the models represented. The similarity of distribution is most likely because the six countries included in ROMM were very homogeneous in that they are all resource-rich, affluent counties with an established profession of midwifery. The presence of high prevalent intervention rates evident in standard care models in countries where, unlike in Canada, midwifery is established and formally autonomous supports the suspected undermining of midwives apparent autonomy observed in the Autonomy visual representation and further raises a question of whether, when the dominant culture of practice is a very medicalized one, even midwifery in the newly introduced models is of lesser strength in terms of midwifery elements and relatively medicalized.

The federal and provincial governmental structure of Canada, where health care governance is within provincial jurisdiction, is similar to commonwealths of countries, such as the European Union and it is therefore reasonable to consider each province as a country for the purpose of this discussion. The ROMM comparison of western Canadian studies in Part 3 included comparison of two versions of the authentic Canadian model when it was introduced into two neighbouring provinces. Although the two models were essentially similar there were some known differences between their locations. Although, overall, very little difference was observable for maternal outcomes, there is a hint of a positive change towards babies born to women receiving care from registered midwives in British Columbia. Without investigating the local conditions, resources and protocols for care in more

detail, it is not possible to begin to determine the reason for this apparent difference between neonatal outcomes.

Although from findings of the ROMM study the country in which midwifery is practised appears to have very little effect on birth outcomes, that some small differences are suggested calls for further study. Further study in less developed, less wealthy countries where midwifery is unregulated would add to the knowledge of the effect of location on birth outcomes when care is provided by midwives. The ROMM study findings further suggested the possibility that within country differences might also be an issue and a need for further study of clearly described, comparable models in different locations within a country.

9.3.2.2 Year of Study

Year of study was defined as the date of the year in which a model was evaluated and only standard care models were included as they represented practice in the environment into which the new model was introduced. As it is known that rates of outcomes fluctuate over time in relation to new evidence, consumer demand and population changes (Anim-Somuah et al., 2005, Canadian Perinatal Surveillance System 2003, Davis et al., 1994, Klein, 2006, Royal College of Obstetricians and Gynaecologists, 2001) it was hypothesised that the year a model's outcome rates were measured may have influenced midwives' practice and indirectly birth outcomes. The findings of the ROMM exploration of the literature show a clear relationship between the year of study and Caesarean rates which increased over time and, to a lesser degree, between year and episiotomy which decreased over time. This is congruent with well documented changes for interventions in resource rich countries globally (BirthChoiceUK Professional, 2007, Johnson, 2009). It also supports the hypotheses that the year in which the midwifery under evaluation was practised influences the effect of midwifery care on birth outcomes and may account for some of the variability in outcome rates across studies and the difficulty in establishing patterns of difference in the exploration of the relationship between midwifery models and outcomes.

The comparison of western Canadian models in Part 3 added little to the understanding of the effect of time on outcomes as, although the two similar models were evaluated six years apart very little difference was seen between outcomes except for a possible slight benefit for babies born in the HBDP model which was evaluated first. This benefit is more likely to be one of location than time, as the rate for the Canadian neonatal morbidity indicator, respiratory distress syndrome, was slightly higher in Alberta than British Columbia during the time period in which the evaluations were conducted (Canadian Perinatal Surveillance System, 2003).

A more in-depth look at the effects of time on outcomes was made possible in the exploration of the literature in Chapter 4 in Part 1 by one of the evaluations in which a midwifery model categorized as having a high score for midwifery elements was evaluated in comparison to the standard model categorized as having a low score for midwifery elements when it was first introduced (McCourt and Page, 1996) and again three years later (Beake et al., 2001) in relation to the same standard model in the same location. Five of seven outcome rates were lower for the new model when measured the second time while rates for the other two outcomes are unchanged. Regardless of changes in rates for the standard care model between the first and second evaluations no instances of higher outcome rates in the new model were observed. A notable exception was for Caesarean sections rates for which a national increase, occurring during the time between the first and second evaluations, was reflected for standard care but the rate remained stable for the new caseload model (Page et al., 2001). In the representation in Chapter 4, both location and standard care were effectively controlled for as they were the same in both evaluations. It therefore makes sense that the change in practice related to Caesarean section in the standard model was related to time. However, that this was not the case for the new model suggests that the model with higher levels of midwifery elements may have been more resistant to the effects of change over time. Therefore, although the visual representation appeared to show an overall relationship between the year of study and outcomes which was also supported by the evaluators findings of a significant overall trend toward increased differences with time

(Page et al., 2001) there is also a suggestion that the year of study is not the only factor responsible for the reported differences.

The situational factor which stands out as the most likely to contribute to such an effect is the degree of maturity of the model of midwifery, although a definitive conclusion cannot be drawn from the evidence provided here. The suggestion of the maturity factor is based on the combined findings of Part1 and Part 3 of ROMM that when one model was evaluated in two locations but in both locations evaluated immediately after implementation of the model, very little difference was found between the selected outcome rates and, when one model was evaluated immediately after implementation and again when it had been implemented for three years significant differences were present.

9.3.2.3 Level of Risk

Level of risk was defined as the level of risk for poor pregnancy outcomes of women accepted into care by midwives. Two levels of risk were identified as low risk and all risks as described in Chapter 4. It was hypothesized that women who were at greater risk for poor pregnancy outcome might be expected to have a higher level of morbidity as risk and outcomes are very probably related (Wu, 2004).

The ROMM visual representation of the relationship between the risk factors reflected the hypothesised greater morbidity for women at increased risk. This is important to note as some model evaluations reviewed included all levels of risk and others low risk only which would not have been differentiated by the classification system. However, it may have accounted for some of the variability in rates of intervention noted in other representations in the ROMM. When asked at the informal focus group in this study about differences between the women who sought care in the FMP and the integrated Albertan model that might make a difference to their birth experiences, midwives who had practised in both models, also identified level of risk as a difference. The midwives perceived these increased risks as possibly resulting in more need for medical intervention, use of technology and assisted delivery and consequently less favourable outcomes.

The results from the comparison of western Canadian studies in Part 3 may shed a little more light on risk and birth outcomes. Although the criterion for inclusion of women in both models compared was that they be low risk, the definition of low risk was different for each evaluation. All women in the model scored as having a low level of elements were categorized as low risk and women were excluded from the trial if they had previously undergone Caesarean section or were primigravidae under 17 or over 37 years of age, even if they were in the low category for initial risk. There were no risk restrictions among the criteria for inclusion in the model scored as having a high level of elements, except those imposed by provincial midwifery regulation which did not exclude women for age or previous Caesarean birth nor impose a weighted risk score limit and consequently 8.9% of women had initial risk scores in the moderate range. This was a clear illustration of how risk may confound findings related to outcomes when it is inadequately defined or omitted from the descriptions of models being studied.

The relationship between level of risk and birth outcomes for women receiving midwifery care suggested by the ROMM should not be interpreted to mean that midwifery care is only appropriate for low risk women, as is claimed by some authoritative bodies in Canada. Sub-group analysis by level of risk in a recent systematic review of midwife-led models of care has shown that the effectiveness of midwife-led models is maintained for women classified as both high and low risk and that midwifery care is appropriate for women regardless of risk (Sandall et al., 2009). This claim is supported by the ROMM as midwifery was shown to be as safe as standard care for matched controls in both the FMP, where all women were low risk, and the IMSEP where some women were at moderate risk. However, it is important to note when evaluating models of midwifery care that assessment of risk is an important factor that, if not carefully measured, may confound results by contributing spurious findings.

9.3.2.4 Birth Setting

Birth setting was defined for this thesis as the environment in which birth was planned to take place at the onset of labour and includes hospital and out-of-

hospital sites. It has been suggested that there is insufficient published research to draw any substantive conclusions about the safely of home birth (Olsen and Jewell, 2009) and although research has been ongoing (Mori et al., 2008b, Amelink-Verburg et al., 2008) it has continued to be inconclusive and to create contention (Amelink-Verburg and Buitendijk, 2008, Gardosi, 2008, Gyte et al., 2008, Mori et al., 2008a, Walsh and Downe, 2008).

The ROMM also found a lack of usable research in the evaluation of models of midwifery as out-of-hospital birth was a very limited option among the evaluated models reviewed in Part 1 and no direct references to home birth as a variable of interest were offered. The need for research on midwife-led models of care that include home birth (Hatem et al., 2008) and its ongoing contentious nature in Canada prompted its identification as a situational factor that might affect birth outcomes for inclusion in ROMM.

The ROMM is the first formal study of the effect of birth setting on the birth experiences of women in Alberta. Unfortunately, because the groups are so small as a result of stratification, testing for statistical significance was not appropriate but the possible differences that are suggested provide useful information for midwives and consumers and point to clear directions for further research. Although the findings are not yet published, they will provide new information to the still present debate in the province about the safety of home birth.

The most striking thing about the results is that more than twice as many women chose to plan an out-of-hospital birth when the choice was available to them at no additional cost. This is higher than expected and probably because all of the midwives had previously had home birth only practices and home birth was therefore the primary goal for many of the women and midwifery care may have been secondary. Nevertheless, although all women had equal opportunity to select the setting of their choice, women who planned out-of-hospital birth had higher average scores for satisfaction and feeling in control and lower average scores for symptoms of postpartum depression pointing to a demand for homebirth as an option among women

seeking midwifery care and some potential benefits of planning birth in an out-of-hospital setting.

Women who planned out-of-hospital births had healthier outcomes and fewer interventions with the exception of episiotomy but, due to the lack of statistical testing, further research is needed to validate these findings. The reanalysis of the IMSEP data and the HBDP data within the ROMM study also points to a need to consider whether there is a difference between women who select home birth when conducting future studies in these settings as the findings indicate that women who choose out-of-hospital birth may be socially more disadvantaged as suggested by results for ethnicity, education and marital status and at greater risk of poor pregnancy outcome related to previous difficult birth experiences such as premature births, miscarriages and abortions. A study of outcomes of women cared for by independent midwives also found that some women choosing homebirth did so because of a previous negative birth experience. (Symon et al., 2009). If this is indeed the case, it is likely these factors would influence birth outcomes.

Although the Alberta study suggests midwifery care by midwives is safe for mothers and babies whether the birth is planned for a hospital or out-of-hospital setting, a troubling finding is that it suggests that although planned out-of-hospital birth appears safe, outcomes related to safety may be more desirable for babies born in hospital. Although the numbers are so small it is quite possibly the result of chance, two reliable indicators of newborn-wellbeing, Apgar score and NICU admissions seem to favour hospital births. However, at 1.9% and 2.8% respectively for planned out-of-hospital birth they do not vary greatly from those in a large, North American, prospective study of 5418 women planning home birth where home birth was concluded to be a safe alternative to hospital based birth. This conclusion was based on lower rates of medical intervention and similar intrapartum and neonatal mortality to low risk hospital births in the United States. In that study Apgar and NICU admission rates were 1.3% and 2.4% for planned home birth but no comparative rates were given for planned hospital births for these two neonatal outcomes (Johnson and Daviss, 2005). Findings similar to those

reported for Alberta were reported for the same model in British Columbia (Janssen et al., 2006a, Janssen et al., 2002). Unfortunately, because the incidence of the relevant outcomes was so low and the groups were so small as a result of stratification, testing for statistical significance was not valid. Actual numbers were not published but in a presentation of a follow-up study of outcomes for the first five years of midwifery in British Columbia, babies of women planning home birth were reported to have been significantly less likely to have Apgar scores of <7 at one minute but not at 5 minutes and NICU admissions were not reported (Janssen et al., 2007a)[7]. The possible differences that are suggested from the ROMM, which are not contradicted by other research point clear directions for further research. Further study and clarification of the effect of planned birth setting on the wellbeing of babies is clearly indicated, particularly as it relates to differences in lifestyle and risk factors of women who choose out-of-hospital birth, if the question of the safety of home births for babies in Alberta is to be answered unequivocally.

The suggestion that while home birth is a safe option for babies it may not be as safe as hospital birth noted in the ROMM and other research continues to be a concern beyond the borders of Alberta and efforts to provide definitive answers continue internationally. One of the major difficulties for the study of birth setting is methodology (Gyte et al., 2009). Although a randomized trial would be the most convincing way to definitively answer the question of the safety of out-of-hospital birth it has proved impossible as women strongly value their autonomy of choice of birth place and are not generally willing to agree to being randomly assigned a birth setting (Hendrix et al., 2009). Recognizing the problems associated with randomization, researchers in the Netherlands, where a data set large enough to show potential differences was available, conducted a large retrospective comparison of perinatal mortality and morbidity for planned home and hospital birth, results of which

[7] When published late in 2009 the findings reported at the presentation were confirmed (JANSSEN, P., SAXELL, L., PAGE, L., KLEIN, M., LISTON, R. & LEE, S. (2009) Outcomes of planned home birth with registered midwife versus planned hospital birth with midwife or physician. *Canadian Medical Association Journal,* 181, 377-83.)

will shortly be published (de Jonge et al., 2009). In the Dutch study, no significant differences were found among low-risk women when the choice of home birth was supported by well-trained midwives and a good transportation and referral system (de Jonge et al., 2009). The need for assurances about the safety of home birth if it is to be actively promoted has also been recognized in the UK where a government funded, integrated programme of research designed to compare prospectively outcomes of births planned for home, different types of midwifery units, and hospitals is also underway and will hopefully provide some definitive answers in the near future (National Perinatal Epidemiology Unit, 2008). It is hoped that the publication and wide dissemination of these evidence-based results will finally put to rest the debate regarding the safety of planned out-of-hospital birth.

In countries where home birth is an available option the current home birth rate has been variously documented as being between less than1% in some counties of the UK (RCM Midwives, 2006) and approximately 33% in the Netherlands (Wiegers et al., 2008) which is well known for its high percentage of home birth (Wiegers et al., 1998, Christiaens et al., 2008, van Tuyl, 2008, Amelink-Verburg et al., 2008). In recent years the value of making homebirth a mainstream option has been recognized (Walsh, 2008) and recommended by governments (Department of Health, 2007) but success in increasing the rates has been limited (Barber et al., 2006, Barber et al., 2007). One thing which was very clear in the ROMM was that the majority of women choosing midwifery care planned to give birth in an out-of-hospital setting. This suggests that in countries where home birth rates are low the adoption of a strongly authentic midwifery model, where an out-of-hospital birth is not only a genuine option but one which is both advocated and supported, could result in an increased rate of out-of-hospital births.

Midwives, are very influential in birth setting decisions (Jabaaij and Meijer, 1996) and when they support and actively encourage home birth at an initial booking visit rates have been shown to be twice the national average (McIntosh, 2008). However, midwives do not always use their influence effectively to ensure women are aware of all their birth setting options

(Barber et al., 2006) and may steer women toward hospital birth (Levy, 1999) if they lack the autonomy to advocate for out-of-hospital birth against prevailing opposition. The lack of an infrastructure that supports home birth also results in midwives adopting a more medicalized view of birth, attending fewer out-of-hospital births and losing the skills necessary to confidently attend birth outside the confines of a hospital. In Canada, reciprocal, provincial legislation requires all midwives to offer out-of-hospital birth to clients and midwives must be primary care provider at a minimum of 10 out-of-hospital births every five years to maintain their registration (Alberta Midwifery Health Discipline Committee, 2008). These regulations were developed as the result of midwives' strong philosophical belief, which is shared by midwifery consumers, that the choice to give birth in the setting of her choice is a woman's right and, therefore, similar models may not be as easily achieved in countries where this belief is not as prevalent.

As presented in Part 3, the ROMM data suggested that, unlike women in other countries (Anderson and Greener, 1991, Hildingsson et al., 2006, Wu, 2004, Longworth et al., 2001, Ackermann-Liebrich et al., 1996, Pop et al., 1995), women who chose an out-of-hospital birth setting in Western Canada tended to be younger, less educated, of greater ethnic variety and more likely to be lone parents. Data available for the Alberta women indicated that those who planned out-of-hospital birth had higher levels of previous spontaneous and elective abortions and premature birth. When combined these findings suggest that, although education, maturity and support may have a role in where a woman chooses to give birth, previous difficult pregnancy-related experiences may also play a role as previous negative experiences are known to affect birth choices (Walsh, 1999). This finding was confirmed by midwives who attended the informal focus group who stated that many women who had had a 'bad [birth] experience' were 'afraid and wanted to avoid hospital care'.

It is interesting that although care was provided by the same midwives during the same time period for both, planned hospital and out-of-hospital births, maternal outcomes were consistently more desirable for planned out-of-hospital birth. Although it is not possible to tell why from the ROMM study,

this may reflect midwives support of the differences in women's preferences and personalities as women who plan a hospital birth have been shown to have a more technological approach to childbirth (van der Hulst et al., 2004). However, other researchers have suggested that homebirth practice may provide opportunities to increase the congruence between espoused midwifery philosophy and actual practice (Vedam et al., 2007). They suggest that being in the hospital environment under the "medical field's view" (Wu p. 202) or under "obstetric gaze" (Davis and Walker p. 4), places constraints on how midwives can practise resulting in a more medical style of practice (Wu, 2004) despite midwives efforts to avert the constraints (Davis and Walker, In Press).

9.3.3 Relationship between Models and Birth Outcomes

When all 30 models were considered in relation to all outcomes in Part 1 of ROMM a surprizingly wide range of outcome rates was immediately visible across the models being explored but the anticipated clear inverse relationship between rates of outcome and model strengths was not present. Hints of a relationship could be seen as the general overall trend was for the new higher scoring models to achieve lower outcome rates than their comparison models. Nevertheless, this was not universally the case as in some instances the outcome changes were equal or even higher for lower scoring models. A clear majority were associated with low scoring model pairs supporting the notion that some midwifery models, which contain low levels of the elements of authentic midwifery, may be close to medical models as midwifery care has repeatedly been shown to result in more desirable outcomes than physician care (Buhler et al., 1988, Cragin, 2002, Fraser et al., 2000a, Grace Hospital Midwifery Program, 1993, Kaufman et al., 2001, Mayes et al., 1987).

The degree to which a model of midwifery is considered to be similar to a medical model is determined by how free midwives are to provide care to women under their own responsibility. In a systematic review, for all the 11 standard models of care against which a midwife-led model was trialled, in all but one midwives provided some of the care with varying levels of

responsibility for care resting with physicians. (Hatem et al., 2008). The classification of models as midwife-, shared- or physician-led care suggests the degree to which midwives are responsible for their own practice and are independent of direct or indirect medical supervision is a continuum and is congruent with the concept of autonomy as an important element in midwifery models in the ROMM study. In fact, the majority of these trials were also included in the ROMM exploration of the literature but classified as midwifery models with varying strengths of autonomy as large amounts of care was provided by midwives regardless of lead professional. The systematic review concludes that midwife-led care was associated with several benefits for mothers and babies in terms of outcomes and had no adverse effects (Hatem et al., 2008). In other words, the more autonomous midwife-led model resulted in preferred outcomes to other less autonomous models, which is congruent with the ROMM representation of the relationship between autonomy and outcomes. The systematic reviewers further suggested that continuity of care is an important component of midwife-led care supporting the ROMM postulation that autonomy is an overarching element which enables continuity which in turn facilitates other elements of authentic midwifery (McCourt and Stevens, 2005). These combined findings suggest that when midwifery models are diluted and contain low levels of midwifery elements they are unable to exert enough effect on the birth experience to improve birth outcomes.

To seek further understanding of the pattern for relationships the process of classification was continued by representing the relationship between models and each outcome individually. For maternal outcomes the lack of a clear inverse relationship between strength of model and outcome rate was again evident for each individual outcome but nevertheless the general trend towards an inverse relationship was persistent for all maternal outcomes. This trend was most evident for epidural and episiotomy, moderately present for Caesarean section and least obvious for augmentation and induction. When the two Alberta models were considered in terms of individual maternal outcomes the patterns were mixed. For two outcomes, episiotomy and augmentation, rates showed a tendency towards lower rates for the

model categorized as scoring lower for elements of midwifery, for two outcomes, Caesarean section and epidural, towards the model categorized as scoring more higher for elements of midwifery and for one outcome, induction the rates were similar for both models. With the exception of Caesarean section and episiotomy the intervals between rates of outcome for the two models were very small.

In addition to maternal outcomes two neonatal outcomes were considered individually for the 30 models identified from the literature review. No patterns or tendencies were discernable for Apgar scores or neonatal admissions as lower outcome rates appear to occur erratically throughout the range of model strengths. The reason for the lack of visible patterns in the models from the literature is most likely because data for Apgar scores and neonatal admissions were not generally presented in a manner that was designed to be helpful for review across different studies and settings. There was very little consistency in the way the outcome variables were measured and there is a good chance they were not truly comparable as they were not measuring the same thing. Also, very few statistical differences were reported. In addition incidence rates were mostly very low and many more subtle or complex factors which are not captured by the model description, such as midwife experience or relations with other professionals were not provided. By contrast, for the Alberta models compared in Part 3, the variables with the most marked lower rates were for the model classified with a higher score of the two models were those in the neonatal outcomes category. For the Alberta models details of the models were available and the data collection methods were prospective and the same definitions and measures were used for outcomes in both model evaluations. Thus the effect of midwifery models on neonatal outcomes can be more confidently interpreted and the low incidence of positive changes suggested by the literature regarded with less concern.

9.4 General and Conceptual Discussion

9.4.1 Meaning and Definition of Midwifery

The review of the literature carried out in the first part of the ROMM to begin seeking an understanding of what midwifery is confirmed that midwifery models are made up of the elements of the authentic Canadian model to a greater or lesser degree. However, some midwifery models appear to have very low levels of these elements (Kenny et al., 1994, Rowley et al., 1994, Waldenstrom et al., 2001), particularly in countries where midwifery is acknowledged to be similar to obstetric nursing (Brodie, 1997, Homer et al., In Press). The models with low levels appeared to resemble the Canadian Hospital Model of care which is a medical model with all care provided by doctors and nurses (Harvey et al., 1995). This model "inscribes pregnancy and childbirth as abnormal, pathological conditions requiring technological intervention and the management of physician-experts" (Spoel and James, 2006 p. 167) and provides care that is "objectifying, fragmented and disempowering experience for women" (Spoel and James, 2006 pp. 167-168) as opposed to midwifery-led models which are based on the premise that pregnancy and birth are normal physiological events that women have the ability to experience with the minimum of technological interventions (Sandall et al., 2009).

Although some models contain minimal amounts of the elements considered to be the building blocks of midwifery, they are staffed by licensed midwives and referred to as midwifery models. This suggests that some midwives may, in fact, be practising in models that are not fully authentic midwifery models and are closer to being medical models with only a limited amount of midwifery influence. What is clear is that the line between midwifery care and other models of maternity care is not distinct.

Midwives have expressed greater satisfaction when practising in models with higher levels of the elements of midwifery. Although they have difficulty in defining what authentic midwifery is, midwives report that they know, intuitively, that it means working in a way that is congruent with their ideals of 'real' midwifery (Hunter, 2006). When able to work in this way midwives feel

they are practising 'real midwifery' (McCourt and Stevens, 2005, Ewing, 2006) or being a 'proper midwife' (Hunter, 2006). However, 'real midwifery', while it appears to contain a high level of the elements of midwifery as defined according to the classification system developed in this thesis,is not associated with any particular model and satisfaction in experiencing it has been expressed by midwives in a variety of models including independent midwives (Ewing, 2006), caseload midwives (McCourt and Stevens, 2005), team midwives (Harvey and Rach, 1998) and community midwives (Hunter, 2006). What is common to these models is that they all contained increased levels of the elements of midwifery compared with standard models of maternity care in the region in which they were located and therefore may have appeared more like 'real' midwifery by comparison.

Canadian midwives have also used terms like 'true', 'traditional' or 'real' midwifery to reflect a deep-rooted Canadian philosophy that being a midwife means more than just providing maternity care (Sharpe, 2004, Field, 2004). In particular, the concept of a 'spirit of midwifery' appears to resonate with Canadian midwives (Rice, 1994). This spirit of midwifery is based in the values and beliefs of midwives and their supporters and is reflected in the elements of the Canadian model of midwifery. In 2007 the term, Spirit of Midwifery, was used as the title of an international conference in Vancouver. In her welcoming address to the conference participants, the president of the Canadian Association of Midwives explained that "The Spirit of Midwifery... refers to the unique and defining features of the Canadian midwifery model of care" (Martin, 2007 p. i) and meant being 'with woman' as a midwife as opposed to just providing midwifery services. The spirit of midwifery is what "distinguishes midwifery care from conventional medical care for childbearing women" (Rice, 1997 p. 149).

That there is a 'spirit of midwifery' which is more than the components of midwifery practice but which is recognized by midwives as real or true midwifery when they experience it is an interesting concept; however the concept appears elusive and difficult to define. Although models of midwifery have been the subject of considerable research over the last two decades, this has mostly been concerned with the comparison of models in terms of

their outcomes, with less consideration of the characteristics that are felt to be intrinsic to the spirit of midwifery. One notable exception is a study by Stevens (2003) which explored the implications of newly introduced, individual caseload practice for midwives. Her findings note, particularly, a high level of job satisfaction expressed by the midwives related to their ability to practice what they defined as "*real midwifery*" (p. 190). By calling this model real midwifery, the midwives were deemed to be indicating a convergence between the ideology of midwifery as taught which was different to midwifery that they had experienced in previous models (Stevens, 2003). Stevens describes this model as similar to that experienced by the original 'handywoman' or traditional community midwifery suggesting it embodies the same spirit of midwifery as Canadian midwifery, which has evolved from the Neighbour Model of the pioneer women. This similarity was confirmed when the caseload model Stevens was studying (McCourt and Page, 1996) was assessed to score highly for the elements of the Canadian model using the classification designed for this thesis.

To facilitate further understanding of what midwifery is and how it affects women's birth experiences, the Canadian model, in its pure form, was assumed for the purposes of this thesis to capture the 'spirit of midwifery' (Rice, 1994) and represent a midwifery model of practice against which to measure other models of midwifery in terms of their strength as authentic or 'real' (Ewing, 2006, Stevens, 2003) midwifery models. The ROMM study has supported the validity of the spirit of midwifery as central to the authentic model. Working through the elements and exploring the published literature as part of the ROMM has validated that the identified elements form the basis of a model which is broader and more generic that could be valuable for classification and research purposes.

9.4.2 Effects of Elements of Midwifery on Selected Outcomes

Of the outcomes that were selected for study in this thesis, three of those available for the majority of model evaluations being explored, appeared to be more sensitive to the model of care women received and were therefore used in the visual representation of the effects of individual elements. When

studied in this way the three outcomes were somewhat sensitive to the strength of elements with epidural and episiotomy appearing to have greater sensitivity than Caesarean section. This reduced sensitivity to the effect of a midwifery model for Caesarean section when compared with epidural and episiotomy is reflected in the evaluations reviewed for ROMM, where for most model pairs a greater difference is seen for rates of epidural and episiotomy than Caesarean section. This difference is most marked for model pairs where there is a distinct difference between the overall strength of the models within the pair. However, for episiotomy the increased sensitivity persists even when differences between the strength of model pairs is very small. This pattern suggests that while episiotomy rates are particularly sensitive to the influence of midwifery models it is less within midwives' grasp to influence Caesarean section rates.

For partnership and continuity reduced rates of maternal outcome measures were present when higher levels of the elements were contained in the model of midwifery suggesting a positive effect on outcome by these elements. This extrapolation, unlike the distribution of the levels of the elements, supports the hypothesis that there is a relationship between partnership and continuity that contributes to the effects of the care women receive on outcomes. That there is a relationship between partnership and continuity is consistent with previous reviews of the literature, which have shown that improved relationships (Saultz and Lochner, 2005) and increased continuity (Waldenstrom and Turnbull, 1998), each contribute independently to improved outcomes. The more likely explanation for the seeming discrepancy for the distribution of the elements, where no relationship was indicated, is the superior definition and measurement of continuity than partnership in the models studied.

The effect of choice on outcomes was more marked than for either partnership or continuity indicating a potentially stronger effect of this element on outcomes than had previously been considered. Interestingly, community had no apparent effect on outcomes raising a question regarding whether where midwives are based and how collaborative they are with the other members of the health care team are as relevant to the outcomes of

the birth experience as they have been postulated to be. Unfortunately, no conclusion was possible regarding the effect of autonomy on outcomes due to the homogeneity of autonomy scoring in the models explored. This apparent homogeneity appears to be the result of a general lack of understanding of what constitutes autonomous midwifery. It has been suggested that because midwives are by definition autonomous practitioners (International Confederation of Midwives, 2005a) they have assumed themselves to be so and therefore found no reason to question their autonomy (Fleming, 1998a). However, at least for British midwives, the claim that they are autonomous has been shown to be fundamentally flawed (Clarke, 1995). Although historically autonomous, midwives are seen to have gradually but surely lost more and more of their autonomy (Thomas, 2007) as childbirth came under the control of doctors and hospitals (Wagner, 2005 p. 12) and many midwives continue to practice in settings that are clearly dominated by the medical and nursing professions (Fleming, 1998a).

Fleming (1998a), in discussing midwives autonomy, identifies two levels of autonomy in which midwives are lacking as collective and individual. To be collectively or professionally autonomous a profession must be self-governing. Self-governance is essential for midwives' autonomy to be legitimate (Yates, 2006) as it enables a profession to exercise control over the tasks defined by the profession to be within their authority. The preconditions for midwives to practise autonomously are not in place in the UK and midwifery practice is still largely determined by medical principles (Pollard, 2003).

British midwives have been governed by a board which, unlike similar boards set up for dentists and nurses, was required to have a majority of medical practitioners (Fleming, 1998a). Although the board was abolished in the 1980s, the medically dominated rules it developed continue to influence the new governing body which regulates the midwifery and nursing professions (Nursing and Midwifery Council, 2009). Both midwives and nurses recognize that joint governance is not in the best interest of midwifery (Kaufman and Houston, 1988) and the dominance of the much larger profession of nursing over midwifery has been perceptible by the subjection of midwives to nursing

structures of time; wearing the same uniforms and the virtual extinction of direct entry education programmes (Fleming, 1998a) by 1983 when only one midwifery school offered such a course (Kent, 2000). Some re-emergence of direct entry programmes in the form of pre-registration courses occurred during the 1980s and 1990s with 44 being available in the UK by 1998 (Kent, 2000) and this number continued to expand although controversy continued over the merits of direct entry over post nursing- midwifery education at the policy level (Bower, 2002, Rhodes, 2000). Although the movement towards direct entry midwifery education appears to continue in the UK, no documented evidence of recent actual numbers was found.

Full hospital privileges, with the right to admit, treat and discharge clients independently of any other professional, are also recognized as a hallmark of professional autonomy (Vann, 1998). Although a requirement for physicians, full hospital privileges are not granted to midwives in the UK except for just over a hundred self employed, independent midwives (Symon et al., 2009), midwives in newly introduced models and some community midwives and are only granted in very few other countries. However, whether hospital privileges indicate collective or individual autonomy is not clear.

Individual autonomy affords a midwife the power both to make decisions and act upon them which, in the UK, is afforded by policies and protocols rather than by autonomous decision making (Fleming, 1998a). New models have used policies and organizational changes to achieve greater degrees of individual autonomy which is variously referred to in the literature as accountability, responsibility, authority and autonomy with the terms often used interchangeable (Batey and Lewis, 1982). Batey and Lewis (1982) suggested a hypothesis that autonomy and accountability are focal concepts of a profession with autonomy at the collective and accountability at the individual level with autonomy as a precondition of accountability. This is consistent with the Canadian model where autonomy and accountability are separate elements. However, the element of accountability was omitted from the ROMM review due to its apparent lack of direct affect on outcomes, although it was reasoned that it would be reflected to some degree through the element of autonomy. In retrospect, it appears that, had it been properly

defined, the inclusion of accountability may have been a useful addition to the ROMM study. What is clear is that greater conceptual clarity about accountability is needed (Batey and Lewis, 1982) if a better understanding of its effect on outcomes is to be gained, which is beyond the scope of this thesis. Nevertheless, the ROMM supports the hypothesis that autonomy is closely associated with and a precondition of accountability and is facilitating of the other elements of midwifery.

In summary, the exploration of the elements suggests a hypothesized model of midwifery in which partnership is the central element of authentic midwifery that affects a woman's birth experience. In this model, choice and continuity are facilitating elements that when present enhance the quality of the partnership between the woman and the midwife, indirectly improving birth outcomes. Although the role of community within this model is less clear it is included in the model until more convincing evidence is available. Autonomy is an important overarching element that enables continuity, choice and the collaboration that is a part of community based midwifery, indirectly facilitating the development of a partnership between a woman and midwife. A representation of the hypothesized model is presented in Figure 9.2.

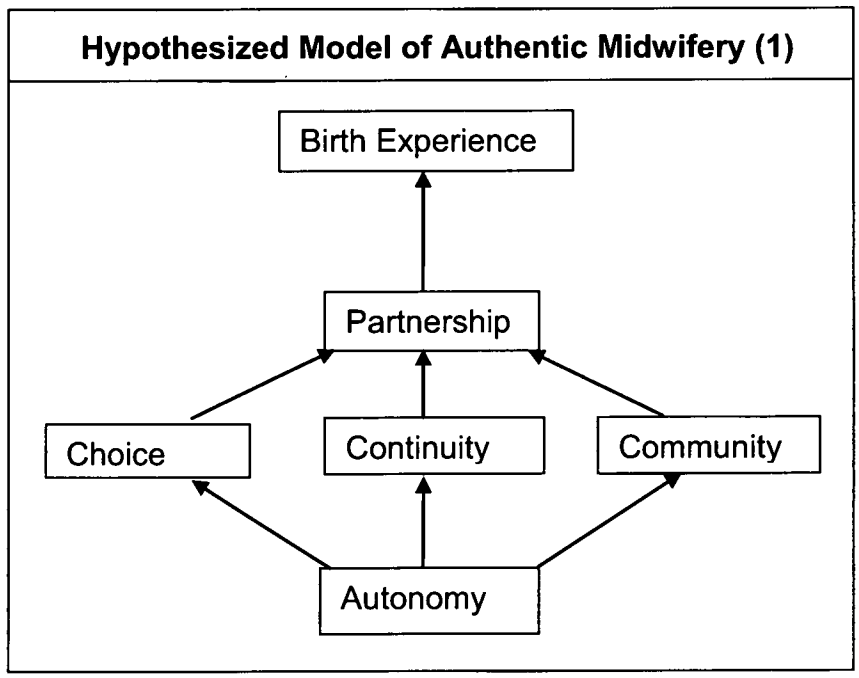

Figure 9.2

The ROMM is the first known study to examine the effects of the elements of midwifery individually by exploring the published comparisons of various models of midwifery. It is therefore a beginning step in this area of research and, particularly in view of the absence of any statistical analysis, can only be cautiously accepted. However, there is some support for the tentative findings for the element of continuity in a subgroup analysis of a systematic review of 11 trials of midwife led care which compared caseload and team midwifery as two distinct levels of continuity (Hatem et al., 2008). The subgroup analysis showed statistically significant differences in some effects. Subgroup analysis also demonstrated statistically significant reduction in some outcome variables when midwifery care that was community–based was compared to hospital based midwifery care (Hatem et al., 2008). The authors advise caution in the interpretation of these results for the same reasons as in the ROMM study. Therefore while being far from scientifically robust the findings relevant to the elements of the authentic model of midwifery, their relationship with each other and their effects on birth experience will inform midwives regarding aspects of their practice and provide a thought-provoking platform from which to launch further inquiry.

9.4.3 Models of Midwifery

The ROMM study supports the concept that relationships between women and midwives are partnerships contributed to by both. This concept is central to midwifery and widely accepted within the midwifery community (Bourgeault, 2000, Cragin, 2004, Flint and Poulengeris, 1987, Freeman et al., 2004, Guilliland and Pairman, 1995, International Confederation of Midwives, 1993, Kennedy et al., 2003, McCrea and Crute, 1991, New Zealand College of Midwives, 2007, Pairman, 1995, Stevens, 2003). The ROMM study also points to the strength of the partnership between a woman and her midwife as directly related to improved outcomes, further suggesting that what the midwife contributes to the partnership may affect the birth experience of women in a way similar to the way elements of midwifery appear to affect birth outcomes.

It has been postulated that it is theoretically possible that differences in outcomes observed between models of midwifery may be the result of the different characteristics of the midwives as the midwife is in a position to intentionally foster and strengthen her relationship with a woman by using her midwifery knowledge and skills (Page et al., 2001). It is, therefore, possible that the success of models in achieving improvements in birth outcomes is as dependent on the contribution of the midwives providing the midwifery care as on the actual elements contained in the model. This proposed theory has been supported by research which found the qualities and behaviours of the midwife were a vital component in relationship building (Kennedy, 1999) and that the attitudes and skills of midwives were directly related to Caesarean section rates (Hemminki et al., 1992) and analgesia administration (Waldenstrom, 1989).

The possibility of different characteristics of midwives affecting outcomes was suggested in Part 3 of the ROMM study when comparing two Canadian midwifery models one of which was twice as strong as the other based on the degree to which they contained the elements of authentic Canadian midwifery. It was hypothesized that, if the difference between the strength of a pair of models is directly proportional to the difference between outcome rates as identified in Part 1 of the ROMM, the higher scoring model's outcomes would be twice as desirable as the lower scoring models. It was unexpectedly found that outcomes were very similar for both models. Two possible explanations for this unexpected lack of difference were identified.

The first explanation lay in the exceptional circumstances of the lower scoring model which was a demonstration project on which the future of midwifery in the province of Alberta could depend. The unique nature of the model could well explain why it was very different from most midwifery models containing low levels of the elements in the published literature that are modified medical models. Although on the continuum of strength as an authentic model the demonstration model was closer to the medical end than the authentic midwifery end it was made up of midwives dedicated to the cause of making autonomous midwifery care available to women against indomitable opposition. "The first professionals to apply for a place in any

innovation might well be considered to be more adventurous or more strongly motivated than others" (Page et al., 2001 p 404) and to be different from those who remain in standard service (Page et al., 2001, Rosser, 1997). The manner of the establishment of the model resulted in a team of nurse-midwives that was made up of women dedicated to the cause of making autonomous midwifery care available against indomitable opposition. Having worked closely with the nurse-midwives I sensed that, in terms of the elements of the Canadian model, the demonstration model was stronger than the score of four suggested. For example, although nurse-midwives appeared to have little or no autonomy, they felt very autonomous because of the immensely increased amounts of responsibility, independence, flexibility and status of their new nurse-midwife role, when compared with their previous positions as obstetrical nurses. The midwives from the demonstration model who attended the informal focus group identified themselves as 'a unique group of very strong and determined women willing to go out on a limb for our strong belief in midwifery' in the hostile environment of Alberta at the time. Such a group might well have been expected to have achieved impressive results, despite the practice restrictions placed upon them by the demonstration model. Although most of the these midwives continued into the IMSEP model where they were joined by other midwives who had been practising independently, they no longer felt they were under the same constant pressure of 'practising in a goldfish bowl' and the accompanying passionate zeal to 'make midwifery happen'.

The ROMM study revealed that the highest scoring models in the literature, in terms of authentic midwifery, were not only associated with the greatest improvement in outcomes but were also made up of midwives who displayed similar characteristics to the midwives in the demonstration model. As with the demonstration model midwives, they were volunteers who applied for the new model because of extreme dissatisfaction with the conventional service and because they felt their role as an authentic midwife was limited by it (McCourt and Page, 1996, Reed, 2002). They were selected for appointment to a new innovative model on the basis of their interest, commitment to midwifery and evidence of enough clinical experience to practise

autonomously (Page et al., 2001, Reed (Reid), 2002). It is noteworthy, that even though appointed, midwives in the demonstration model and other models assessed to contain high levels of midwifery elements had actively lobbied for a more authentic model and participated in its planning and implementation (Reed (Reid), 2002).

Although it seems clear there is something about the attitudes and behaviours of midwives who are able to contribute to their partnerships with women in a way that beneficially affects their birth experience (Butler et al., 2008), defining those characteristics has proved elusive. When asked about the characteristics that enabled them to provide exemplary care, midwives in the informal focus group talked about 'thick skin, comfort with being an advocate, comfort with midwifery technical skills, previous experience and education in counselling, maturity and life skills'. These characteristics were seen to be necessary for them to provide the kind of midwifery they believed in strongly, described by them as '"all about the woman and her transformation. We need all women to know that power"'. An independent non-midwife observer of the focus group noted "*An attitude or belief that stood out for me was seeing that their* [the midwives] *role in this woman's experience was much more than providing pregnancy and delivery care it was to support the women in this transition, to help them* [the women] *to be present for the experience and to help them to become stronger women. They did not say that this specifically made an outstanding midwife but it so resonated with me*" (McNeil, 2009).

The belief that resonated so strongly for the unbiased observer is clearly an expression of being 'with women' as a midwife (Flint, 1986), which is the spirit of 'true midwifery' that recognizes the essence of being a midwife as being an integral part of woman's experiences of bearing children and enabling her personal transformation through sharing those experiences with her. Midwives consider this philosophy of midwifery to be the thing that most differentiates them from other maternity care providers who attend but do not share the experience of birth (Rice, 1994). It is the most common reason midwives choose a career in the profession (Ventre and Spindell, 1995). Recent research has supported this philosophy as central to midwifery by

identifying midwives' belief in empowerment of women as an important outcome of exemplary midwifery (Kennedy, 1999). Women who have received care from midwives in the Canadian and other models assessed to have high levels of the midwifery elements have also identified the qualities and behaviours of the midwife as instrumental in empowering personal growth (Field, 2004, O'Brien et al., 2004, McCourt and Stevens, 2005, Edwards, 1998). The midwives from the demonstration model in the informal focus group may well represent all exemplary midwives in being passionate about midwifery (Kennedy, 1999) and strongly imbued with the spirit of midwifery but unable to clearly articulate it, as other midwives have found it difficult to define although those who have experienced it find it more satisfying (Sandall, 1997a, Stevens and McCourt, 2002, Stevens, 2003, Sandall, 1997b) and know, intuitively, that it means working congruently with their ideals (Hunter, 2006).

A study of midwifery in Alberta found that "women who have a passion for midwifery...see it as a calling" (Field, 2004 p. 138) implying midwifery calls women to be 'with woman' in childbirth. Midwives in the United States also appear to feel this way about midwifery and have recorded their reason for entering the profession as the result of a calling or an epiphany moment (Ulrich, 2009). Women[8] called to practise midwifery appear to have special affinity with women during pregnancy and birth (Robertson, 1977) which may be squashed out of them by a maternity service that does not place the needs of women at the fore (Kirkham, 1999). Based on this line of reasoning it can be hypothesised that the degree to which the midwife is committed to midwifery and embodies its spirit may influence her relationship with a woman and contribute to the woman's experience of childbearing and result in improved outcomes. Therefore, in the model of authentic midwifery hypothesised in this thesis, the midwife herself is considered a critical element and central to the model. In this model the spirit of midwifery is robust within the midwife and contributes to women becoming stronger

[8] As far as can be discerned all midwives studied in the ROMM were women and very little research is available for men. The discussion in this thesis therefore refers only to women.

through the birth experience and consequently achieving more positive outcomes. The midwife's ability to establish an effective partnership is enhanced when a midwife works in a practice model which is strong in the other elements of authentic midwifery, choice, continuity and community (Williams et al., In Press), which are more likely to be strongly present when midwives are truly autonomous. The model of authentic midwifery, therefore, appears to support the midwife's ability to bring the spirit of midwifery to her relationship with a woman. Therefore, the model hypothesized in 9.4.2 has been expanded to include the midwife as a central element as represented in Figure 9.3.

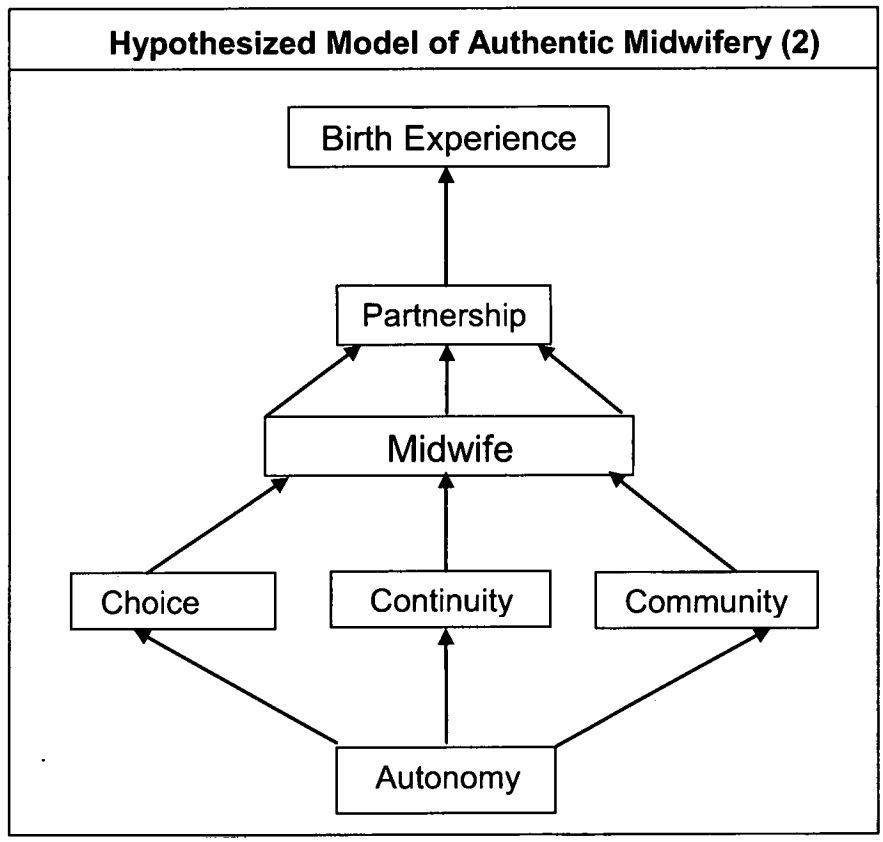

Figure 9.3

The second possible explanation for the unexpected finding that outcomes were very similar for both the low scoring demonstration and the high scoring regulated midwifery models is the length of time models had been established when evaluated. The length of time a model has been established has rarely been considered in previous publications but may have considerable relevance when models containing different levels of the elements of authentic midwifery are being compared. It has been suggested that "generally organizational change should be given time to become 'routinised' before attempting evaluation" (Sandall et al., 2001b p. 7) and evaluation of new midwifery models should not be attempted before the end of the first year (Rosser, 1997).

In the ROMM comparison, while time for routinization had been provided for the model assessed to have limited levels of midwifery elements where the midwives had spent almost one year in educative preparation and two years in practice prior to the evaluation, midwives in the model assessed to have high levels of elements began practising in their capacity as registered midwives with only three to five days classroom orientation and the evaluation began the very first day. Midwives who participated in the registered midwifery model and attended focus groups to provide qualitative data for IMSEP, felt they should have had more time in the new model for them to become comfortable with their changed role before the model was evaluated (O'Brien et al., 2004). My personal participant observations in the two model evaluation periods confirmed the presence of differences between the midwives as those in the demonstration model had opportunity to become familiar with the new model and gain confidence and fluidity of practice, while those in the registered midwifery model were still struggling to deal with increased autonomy and responsibility, prescribing pharmaceuticals, increased caseloads with the different kind of client that resulted from grant funded midwifery who were described by midwives as "less philosophically aligned with midwifery" (O'Brien et al., 2004 p. 129) and often in unfamiliar surroundings. The midwives in the registered midwife model further defined the shift in the population seeking midwifery care as

more "vulnerable and high needs" such as "teenagers and poor women". Midwives in the informal focus group described them as 'women who want a lot of TLC but don't subscribe to midwifery".

The ROMM study exploration of published studies provided one example of an evaluation of a midwifery model where the possibility of duration affecting outcomes had been addressed. When a new model of midwifery, which was strong in the elements of the Canadian model, was introduced it was evaluated and found to result in lower rates of obstetric intervention than standard midwifery care (Page et al., 1999). The researchers realized it was possible that the outcomes were unrealistically positive due to "the first flush of enthusiasm with highly motivated staff" (Page et al., 2001 p. 700) or were "not as good as they might have been because midwives were learning their new roles" (Page et al., 2001 p. 700). Therefore, four years later the evaluation was repeated when the midwives were deemed to be less likely to be adventurous than the first group and more representative of midwives in general. The purpose was to ascertain whether the change in intervention rates had persisted. The results were consistent over time and the researchers concluded that they were not a result of personal or intrinsic characteristic of the midwives (Page et al., 2001). However, it is difficult to know if this is actually the case as, although four years old the model was still rare and may still have attracted midwives more committed to the model (Page et al., 2001). In addition it is not known how long the midwives who were assessed in the second evaluation had been practising in the model. Midwives recounted a period of rapid professional and personal development when they began working in this model (McCourt and Stevens, 2005) so it is possible that some new midwives may have had opportunity to advance their skills and confidence under the mentorship of some original midwives who remained.

This difficulty in differentiating between midwives who are pioneers in new models and midwives who enter once a model is established is also a problem with the demonstration and regulated models that were compared in the ROMM as many were the same midwives. Midwives who had practised in both evaluations, were still practising and attended the informal focus

group suggested a possible explanation for the apparent paradox. They said that new midwives who were attracted to midwifery in 2008 'had the same basic philosophy of midwifery but "not the same commitment to advocate as the ones who had struggled [to make legitimate midwifery a reality]". While this was not as good as attracting passionate midwives it was "alright as long as you attracted the right kind of midwife". They had found their education program for the demonstration project that included experience, mentorship and role modeling, "although mentorship was the most important", had helped them develop as outstanding midwives and could help other new midwives'.

These midwives are not the first to suggest that, while some midwives may have a strong commitment to midwifery that facilitates their ability to positively influence partnerships with women, the expertise of exemplary midwifery can be acquired and nurtured (Robertson, 1977). Thomas (2007), while studying two groups of midwives, one group that worked in the hierarchical, conventional British system and another group who had chosen to move to more authentic models, both in the UK and in other commonwealth countries, found a personality difference in those in the more authentic models that may have been a predisposing factor that contributed to their choice to move out of the 'mainstream'. These midwives expressed a belief in midwifery, similar to the spirit of midwifery recognized by Canadian midwives, which was proposed to be the reason they chose the environment of a more authentic model in which to practice. However, Thomas (2007) concludes, that at least in part, these midwives learned this belief from effective role models, their peers in peer review and the women for whom they cared. The importance of mentorship and experience within models in the education of midwives has also been identified by several researchers (Bailey, 2002, Jordan and Farley, 2008, Licqurish and Seibold, 2008, Rawnson et al., 2008, Theobald and Mitchell, 2002, van der Putten, 2008). This line of reasoning, that women are drawn to midwifery when their beliefs are consistent with the spirit of midwifery and that the spirit is nurtured and fostered by experience and mentorship, is consistent with the traditional authentic model where apprenticeship was the education model de rigueur. It

also suggests why many Canadian women and midwives have been fearful that the midwife's role would be co-opted by the system and her philosophy of care corrupted when midwifery became mainstream and education became university based (Bourgeault, 1996, James, 1997, Benoit, 1987).

9.5 Reflection

9.5.1 Strengths and Limitations of Part One: Literature Review and Exploration of the Relationship between Models of Midwifery and Birth Outcomes

The ROMM is the first known attempt to classify the elements of authentic midwifery, estimate their strength in models and study their individual and combined effect on the birth experiences of women using a new and innovative process. The creative nature of this part of ROMM requires the findings to be interpreted with extreme caution. However, the goal of this part of the study was not to draw absolute conclusions but rather explore previous research and contribute to a thought-provoking platform from which to launch further inquiry. In this goal the ROMM was successful.

The ROMM presented a basic understanding of the relationship between models of midwifery and outcomes. The recognition that the degree to which a model of midwifery affects outcomes is directly related to its strength as an authentic model of midwifery is an important finding. There are many reasons why the suggested correlation between the degree to which the elements of an authentic model of midwifery are present in a model and the quality of the birth experience cannot be considered as more than a tentative suggestion on which to base a testable hypothesis. Perhaps most relevant is my own personal bias, as I firmly believed in the spirit of midwifery and the ability of a model to affect the outcomes of the birth experience when I began the exploration of the published literature. While every effort was made to adopt a rigorously objective approach to the exercise, it was not possible to completely eliminate this bias. Nevertheless, I did not know if my beliefs were justified, especially when the first attempts to show a relationship without controlling for situational factors did not clearly show the expected result. I was, therefore, encouraged when the pattern of a clear, positive correlation

appeared between the calculated aggregate difference in outcome rates and the differences in strength of model pairs in the visual representation.

In addition to my bias, the classification of the models was conducted using a previously untested classification process and a prototype generic typology, both of which were developed for this thesis. Also of note, the whole process by which the relationship was identified was a technique of visual representation that is artistic in nature and not based in traditional scientific methodology and has not previously been used to explore the relationship between models and outcomes..

The final limitation that should be noted is related to the outcomes that were selected for the exploratory exercise. Overall, these variables appeared to be sensitive to the effects of midwifery models to varying degrees but the markedly limited definition of the variables and lack of congruence in the way they were measured in the publications reviewed limits the confidence that can be placed in the degree to which an outcome was similar across studies, despite efforts to transform them to standard measures. However, in the final part of the exploratory exercise this limitation was mitigated as the calculated differences in strength were measured between pairs of models that were compared in a single study and the same outcome measures used for both models.

9.5.1.1 The Classification System

While the classification system showed promise for being a useful means of classifying models, using it in the ROMM has served to identify a number of limitations to its use in its present state but has also provided direction for improvement. The classification system was designed in two steps, the identification of the elements of an authentic model of midwifery and the process of assigning a score based on the degree to which a model contains those elements. For reasons of clarity the two steps will be addressed independently here although both apply to the classification system developed for the ROMM.

9.5.1.1.1 Identification of Elements

The elements which constitute an authentic model of midwifery were identified as a generic typology for the classification system. The typology, although it was designed based on the components of the Canadian model, clearly defined and consistent with terminology used in the international midwifery literature, was untested. Prior to the ROMM the elements had not been validated and although they came together smoothly to underpin the hypothesized authentic model presented in this chapter, problems were identified with some elements. As discussed in Chapter 3 and above the element of community was only cautiously included due to lack of understanding of its nature and there was a suggestion that accountability, which was omitted from the classification, should probably have been included either as an independent element or as a subset of autonomy.

Despite these inadequacies, the value of the identification of elements as a prototype for a needed generic typology by which the strength of individual and combined elements can be measured and compared between models was evident. To develop it to the point where it could be used with confidence it will be necessary to address the deficits identified through further refinement and validation. This can be done by using qualitative research techniques to survey midwives and other stakeholders to define more discretely and validate the elements identified. The classification system can then be tested for use in the evaluation and comparison of models of midwifery where good description of the models and definition of the elements they contain are available.

9.5.1.1.2 Assigning a Score

As the ROMM was the first known attempt to assign scores to elements, the decision on how to assign scores was arbitrary but guided by the need for a scale that was broad enough to discriminate subtle differences. However, as the majority of the models to which the scores were to be assigned provided very limited description of their elements, it was also considered advisable to use as narrow a scale as possible to maintain sensitivity. As there were five elements to which a score would be assigned in each model a scale which

resembled the Apgar score, which is familiar to midwives, appeared to meet these criteria and was used as described in Chapter 3.

Overall, the scoring system showed an ability to accurately measure the strength of elements, both individually and combined, which was remarkable based on the lack of rigour in the design process. However, there were some problems, not least of which was its lack of ability to predict accurately the overall strength of an uncharacteristic model as well as conventional situations. A major flaw with the scoring system, while not evident from the findings, was clear during the process of assigning scores. For example, the element of choice, for which informed choice, choice of caregiver, control over decision making and choice of birth setting were all included in the element, 0 to 2 did not provide enough options to clearly differentiate between models. However, for autonomy, the opposite was found as almost all models were assigned the middle score of 1. This suggested that the scoring scale, which ranged from 0 to 2 for each element, may be too blunt to pick up subtle differences between models and that a wider range, such as 0 to 5, may have provided more sensitivity. However, the limited description of the models and the elements they contained in the publications reviewed also contributed to the inability to identify subtle differences. It is therefore not possible to know, without further testing using well described models, whether a wider range of scores would provide more sensitivity to the classification of models by degree of authenticity.

As the process of assigning a score was considered to have potential as a valuable tool to differentiate between models by measuring their strength and to have sufficient merit to develop it further, this difficulty will need to be resolved. This would be possible by testing the classification system but the first step would need to be testing using known models for which clear descriptions of the models and definitions of their elements are available as at present it is not possible to be sure if the problem is a limitation of the scoring system or a lack of high quality data on which to use it. In addition, refinement of the elements to a more in depth level is needed to facilitate more precise scoring. It will then be possible to consider the appropriateness of the range of scores in the scale and adjust it as necessary.

9.5.1.1.3 The Visual Representation Process

The process of visual representation was adopted for use in the ROMM as the result of a perceived need for a way of displaying the aggregate results of multiple comparative studies of models of midwifery. As a visually orientated learner the idea of a clear and concise picture that could be quickly and easily interpreted was attractive to me. The use of visual representation seemed to meet this need. Therefore Excel (Microsoft, 2007) was used to generate spider diagrams using the published results of multiple studies, so that potential relationships between models of midwifery and birth outcomes were visually displayed.

Although previously untested, for the purpose for which it was used, the process of visual representation proved effective in providing easy to read and interpret visual displays of potential relationships between models and outcomes. The major limitation identified for using this process was not related to the process itself but to the available data. The dearth of comprehensive descriptions of models and consistent, well-defined outcome measures in the literature reviewed was a clear weakness in the effective use of the process of visual representation in the ROMM.

9.5.1.2 The Future of the New Process for Exploring the Relationship between Models of Midwifery and Birth Outcomes

Using the system of classification and the visual representation process to explore the relationship between models of midwifery and birth outcomes in the ROMM study has reinforced for me that there is a real need for tools of this nature. Further research in this area is essential for the development and implementation of effective models of midwifery care. The system for classifying and measuring the strength of midwifery models developed for this thesis, is a good first step in achieving this goal. The process of visual representation provides a means of exploring an aggregate of credible, multi-method research studies that are not necessarily combinable using scientific methods or do not meet the criteria for formal systematic review and could be a useful research tool for combining and analysing comparative research studies.

Despite their limitations, these two basic tools used in ROMM show merit as a means to identify patterns and trends that provide direction for the development of testable hypotheses and more in-depth enquiry. The classification system and visual representation process are tools which could, with refinement and testing, be valuable additions to the research process.

9.5.2 Strengths and Limitations of Part Two: Description of Selected Outcomes of Regulated Midwifery in Alberta, Canada

The ROMM study was an extension to the larger IMSEP, which was conducted to evaluate newly regulated midwifery in Alberta. As described in Chapter 5, IMSEP was a prospective, descriptive study of a volunteer cohort of women receiving midwifery care. The quality of data collected prospectively and specifically for the purpose of describing regulated midwifery is believed to be superior to the other sources of data that were available. That a randomized controlled method was not used may be considered a limitation of the IMSEP design as RCTs are considered the gold standard of evaluation research (Fink, 1993, McKee et al., 1998). However, as randomization was not possible, for a number of reasons, this limitation was minimized by using a non-randomized, matched, comparison group of women receiving care from other caregivers, as the results of randomized and non-randomized studies have not been found to be substantially different when rigorously conducted (Black et al., 1998). Along with the comparative study, a qualitative analysis of focus group and interview data for a group of stakeholders was conducted as part of IMSEP. The findings of the comparative and qualitative parts of the study provided contextual data and validated ROMM findings throughout this thesis. Using this mixed methods approach has added strength to the to the ROMM as a better overall understanding of the local situation was gained than by using either qualitative or quantitative methods alone because mixed methods provide strengths that offset the weaknesses of both (Creswell and Plano Clark, 2007).

The size of the sample for the IMSEP was limited by the funding available to provide midwifery services. Consequently, the sample was too small to allow for statistical testing of some outcomes and most subgroups. This is a serious limitation particularly for the ROMM where the sub grouping of women by planned birth setting resulted in even smaller groups. Although this was a problem for most outcomes, as safety of babies born at home is a major concern, the small size of the sample is a major weakness for newborn outcomes, which is exacerbated by the low incidences of mortality and morbidity in babies. As will be discussed in the next section, the limitation of sample size is diminished by the addition of Part 3 to the ROMM study.

The findings of the IMSEP study (O'Brien et al., 2004), which were submitted to the provincial government, supported midwifery when practised by registered midwives in Alberta as a safe and satisfying alternative to standard care, even when the majority of births occur at home. As a result, the research has been partially responsible for the growth of midwifery from 18 practising registered midwives at its introduction to 33 practising, at the beginning of 2009 (Rach, 2009), midwifery's imminent public funding[9] and substantial progress in the development of a baccalaureate midwifery degree at Mount Royal College, a degree granting community college in Calgary, Alberta[10]. The findings of the ROMM study add further confidence to the recognition of midwifery as an appropriate model of maternity care for Alberta women. The research was also valuable as it provided findings which could be compared with other models of midwifery in Canada thus adding to the overall understanding of the effects of models on birth outcomes.

The secondary analysis of the data used for the descriptive analysis stratified by birth setting was the first formal research into out-of-hospital birth in a province where home birth is a very contentious issue. It is also important

[9] As of April 1, 2009 midwives have been publicly funded in Alberta. LANG, M. (2009) Alberta midwives reach deal to be publicly funded. Calgary Herald. Calgary.

[10] Mount Royal College was granted University status on May 26, 2009. GOVERNMENT OF ALBERTA (2009) Post-Secondary Learning Amendment Act, Spring 2009. Edmonton, http://aet.alberta.ca/post-secondary/policy/roles.aspx.

because it contributes to the very little research on the effect of different models of midwifery in various settings available internationally. That research in this area is urgently needed has been well documented (Hatem et al., 2008). The publication and distribution of the ROMM findings will begin providing this information for Alberta.

9.5.3 Strengths and Limitations of Part Three: A Comparison of Effects of Midwifery Elements and Situational Factors on Outcomes in Three Canadian Models

The comparison of three western Canadian models in Part 3 of ROMM provided an opportunity to analyse similar Canadian models in adjacent but different locations and different Canadian models in the same location over time. The inclusion of the British Columbia model (Janssen et al., 2006a, Janssen et al., 2002) in the comparison added greatly to the ability to interpret the findings of the Alberta study for birth setting presented in Part 2 of the ROMM as it studied the same model of midwifery but for a population of women that was large enough for statistical testing with the exception of mortality and a few rare neonatal outcomes.

A major advantage of studying relationships in the three western Canadian model evaluations over studying those published in the literature is the degree of detail which is known about them in terms of both the models and the research. Lack of description of midwifery models and the elements of authentic midwifery they contain is a major limitation in interpretation of the findings of the comparisons of midwifery models in the published literature. This was not the case with the comparison of western Canadian models as detailed definition of all models was available through publication and personal knowledge. Confidence that one was accurately measuring the strength of a model using the classification system developed for the purpose was possible and the utility of the classification system was consequently enhanced. As a result, greater confidence and generalizability of the findings of the comparison of Western Canadian models was possible.

The definition of outcomes was similarly a strength in the comparison of western Canadian models. Lack of definition of outcomes is a problem in the

published literature but the use of different measures for the same outcome compounds this limitation. Although there were some small discrepancies between the outcome measures for the western Canadian models, concerted efforts to use the same outcome measures reduced the disparities to a minimum. Comparing the three western Canadian model evaluations revealed how collaborative efforts by researchers to standardize measurement of outcome variables can be effective but also identified how some differences can still occur even when collaboration occurs. This finding not only points to the need for consistency in the definition of a core set of data items to facilitate future research on models of midwifery but suggests strategies for achieving standardization of data items and data collection tools.

Chapter 10: Conclusions and Implications of the Relationship between Outcomes and Midwifery Models

In this final chapter the overall conclusions of the ROMM and its implications for midwifery practice and research are presented.

10.1 Conclusions

The initial and core aim of this dissertation was to describe the newly introduced registered midwifery model in Alberta in terms of selected birth outcomes as a means of addressing questions about the safety of midwifery care and the appropriateness of including midwifery services in the existing maternity care system of the province. The analysis of outcomes within the IMSEP showed that midwifery could be introduced into mainstream maternity care in Alberta and that midwifery care, with the strongly authentic midwifery model that was adopted, was safe with outcomes that were good and was satisfying for women who chose registered midwife care. The reason no significant differences were found for the outcomes selected for study with the matched control group is unclear as this differs from the earlier FMP trial and the rates are very similar to the comparable British Columbia study of the same model where significant differences were reported.

In addition to the core theme, the ROMM study further explored the relationship between models of midwifery and the birth experiences of the women and babies cared for within those models. When considered together, the three parts of the ROMM study made a persuasive case for the existence of a relationship between the model of care within which midwives practise and the birth experiences of the women for whom they care. The relationship was expressed as a direct, positive correlation between the degree to which a midwifery model contained the elements of the model and birth outcomes. The ROMM also generated a hypothesized model of authentic midwifery in which the elements of midwifery support the midwife in contributing to partnerships with women that empower the women to achieve more favourable birth outcomes. Situational factors were also shown to have the potential to affect outcomes to various degrees with birth setting being the clearest example of the effect of a difference in outcomes being

associated with a situational factor. It was further suggested that the elements of authentic midwifery may mitigate or enhance the effects of situational factors. The ROMM also showed that the Canadian model, from which the authentic model studied in the ROMM was developed, was safe and satisfying for mothers and babies whether birth was planned to take place in hospital, at home or in a free standing birth centre. In this model the midwives have a high level of autonomy; they provide midwife-led care for low-risk women, practise across service boundaries and attend out-of-hospital births. Many countries, other than Canada, aspire to but do not have strongly authentic models of midwifery established. This study demonstrates that such a model can be integrated into a health care system and can provide safe care that is acceptable and satisfying to women and midwives.

The ROMM study demonstrated a method of classification of the elements of midwifery using commonly understood terms. The classification system is a first step in the development of a generic nomenclature and process of quantitatively measuring models in terms of their strength as authentic models of midwifery. With refinement and testing this could become a useful tool for the study of models of midwifery. The ROMM study has also demonstrated that it is possible to use a process of visual representation to explore aggregate findings from multiple evaluations of models of midwifery, including those which are not randomised trials and not generally suitable for meta-analysis. This process was shown to be a means of gaining a general understanding of the combined meaning of multiple evaluations and developing a platform for further research.

10.2 Implications for Practice

In most countries in the world midwifery is a profession undergoing a process of reorganization. There is a universal impetus, begun by midwives and the women they serve and increasingly supported by governments, to free midwifery from the restrictions imposed by the influence of modern, technological medicine and to establish it as an autonomous, woman-centred profession. The findings of the ROMM study provide clear support for this initiative by demonstrating that the higher a model of midwifery scores for the

elements that are components of the aspired-to model, the more likely women are to experience positive outcomes of childbearing and midwives to be satisfied with their experience of midwifery. The implications for Canada seem to be that midwifery could and should be introduced more widely into the health care service and recognized as a mainstream profession.

The ROMM study provides direction on how midwives' practice needs to be supported by infrastructure to enable them practice in the authentic model and facilitates development of their relationships with women that lead to improved outcomes. In an ideal infrastructure all the elements of an authentic model of midwifery are facilitated. The most important of these elements and the most often restricted or overlooked is autonomy. The ROMM identifies autonomy as an overarching element of a midwifery model which must be present for all other elements to be fully present. That self-governance is essential for legitimate professional autonomy is often not recognized and midwives are deemed autonomous but in fact are not, thus the degree to which other elements of midwifery are possible is limited. Greater recognition of this misinterpretation of what constitutes legitimate autonomy and its introduction to jurisdictions where it is not present is an essential first step to the introduction of fully authentic models of midwifery. The ROMM study also suggests that accountability may be a subset of autonomy which is almost as important as autonomy and almost as often restricted. Accountability, like autonomy, has the ability to enable other elements of midwifery as midwives who have accountability are responsible for their own decisions and are more likely to be self-managed, have full hospital admitting privileges and prescribing rights. The attainment of legitimate autonomy and accountability is beyond the ability of the profession of midwifery alone as it involves decisions of government and in some cases changes in legislation. However, in countries where midwives and the women they care for have united to lobby governments, often against considerable opposition from other professions, they have achieved both. To achieve and maintain professional autonomy and accountability midwifery associations, midwives and midwife supporters need to remain alert to government agendas and where necessary take action for change. When midwives are fully autonomous the

three other necessary elements of authentic midwifery; continuity, choice and community are much more easily put into place as midwives can make their own decisions about how to practise.

Although the spirit of midwifery is a set of beliefs that some midwives have developed before they enter the profession, there is evidence that if nurtured and fostered it can be enhanced and made stronger. Therefore it is not only necessary to attract women whose attitudes and motivations are congruent with authentic midwifery but also necessary to ensure that a spirit of midwifery is encouraged in the education and continued development of midwives. The traditional apprenticeship model of education, in which women who were motivated to become midwives, enhanced their motivation through working under the guidance of an experienced midwife, was ideal for fostering and developing the art of midwifery and many midwives still believe that the best people to teach midwifery are those who are practising it. In Canada where the ROMM was conducted and where the authentic model is mandated, midwives recognize role models and experience as the best way to instil a spirit of midwifery but even those who prefer an apprenticeship style of learning recommend a baccalaureate degree in midwifery as the preferred style of education as it offers status and an acceptance by the medical community and the general population (Bailey, 2002). Leaders in midwifery education need to focus on programmes that are direct entry and university based with a curriculum that teaches the science of midwifery and has a major component of clinical placement in models of midwifery that are strong in the elements of the authentic model under the mentorship of experienced midwives with a strong sense of the spirit of midwifery in a way that emulates the apprenticeship model as closely as possible.

In summary, the ROMM study implies that a three prong approach of 1) attracting midwives with the attitudes and motivations that are conducive to midwifery, 2) providing supportive infrastructure for an authentic model of practice and 3) ensuring midwifery education programmes teach the science and foster the spirit of midwifery is necessary if the profession is to achieve its goal of satisfied midwives providing optimal care to women and babies in authentic midwifery models..

10.3 Implications for Research

As with most research, the ROMM study raises as many questions as it answers. However, as a major purpose was to contribute to a platform from which to generate researchable hypotheses into the nature of the relationship between models of midwifery and the outcomes of childbirth, this is a hoped for result of the ROMM.

Building on the work of previous researchers and using the Canadian model as a starting point, five potential elements of midwifery were identified and presented as a prototype generic typology as the basis for classifying models and determining, as a quantitative measure, the degree to which they contained the various elements. Although this proved a useful tool, some deficiencies in the classification system were identified. In particular, although the system seemed able to measure the overall strength of most models it was not sensitive enough to accurately measure the strength of models in exceptional circumstances. In addition, it was clear that some elements of the classification system had not been well studied in the literature and therefore were less well understood. The potential usefulness of a generic typology and classification system for studying the effects of models and their constituent elements on the birth experiences of women suggests the development of such as system would be a valuable tool for research. Further refinement and testing of the prototype typology and classification system developed in the ROMM would be a fruitful pursuit of further research.

A second process for studying relationships between midwifery models and outcomes that was introduced in the ROMM was visual representation of the models and outcomes studied. Although an artistic, as opposed to a scientific, endeavour, this process proved very useful in aggregating data from different research studies as a means of generating new hypotheses or refining existing ones. When applied to available published evaluations of midwifery models the classification system and the visual representation process combined to identify a clear relationship between the strength of a model, in terms of the elements it contained, and selected outcomes, which

was not visible from conventional methods of reviewing the literature. Although this relationship can only be used as a guide to further research, due to the lack of scientific rigour of the method of study, further development and testing could validate visual representation as a legitimate tool of rigorous research. Until it is validated, the process of visual representation remains a useful tool for exploring the literature prior to planning research on models of midwifery.

Although relationships between some elements of midwifery and outcomes have been identified previously, the ROMM is the first study to identify, albeit cautiously, a clear correlation between the models and outcomes in which the more a model is made up of the elements of the authentic midwifery model the more positive the outcomes of birth will be. This is an important finding which can provide direction and vital support to the initiatives to restore and maintain autonomous midwifery. However, further study which includes rigorous testing is needed before the correlation of models and outcomes can be validated.

In addition to the model and its elements the ROMM suggested possible relationships between a number of situational factors and outcomes. While possible relationships were identified, full understanding was not possible within the limitations of the ROMM study. Good understanding of these relationships is essential for authorities planning maternity services which include midwifery and research, which follows up on the hypotheses suggested by ROMM, could contribute to this understanding.

One situational factor for which an effect on outcomes was identified in the ROMM was planned birth setting. This finding points to the urgent need for further research into the effects of planned out-of-hospital birth on morbidity for babies. Although the literature abounds with publications related to the safety of home birth there is insufficient reliable evidence to consider home birth unequivocally safe (Olsen and Jewell, 2009). The ROMM study, while far from conclusive, suggests babies whose mothers plan to give birth in hospital may have more positive outcomes. In light of the popularity of home birth as a choice for women when it is available and the efforts to increase

homebirth rates in many parts of the world, research to conclusively answer outstanding questions regarding the safety of babies whose mothers plan out-of hospital births and identify the conditions and services which might support safe out-of hospital childbirth would be very timely.

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APPENDICES

APPENDIX A

Summary of the Assessment of Quality of Evaluation Research

(X indicates studies included in the Cochrane Systematic Review)

Quality of Study Summary Sheet (McCourt et al., 2007)

Study 1: Albany Midwifery Practice (Sandall et al., 2001)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Yes
Aims and objectives clearly stated	Yes
Clear description of context	Yes.
Clear description of methods used to collect and analyse data	Yes. Quantitative and qualitative.
Attempts to establish reliability and validity of data analysis	Minimal.
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	No information given
Rationale for numbers given	Yes
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	N/A

Quality of Study Summary Sheet

Study 2: One-to-One Midwifery – First Cohort (McCourt and Page, 1996)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Yes - comprehensive
Aims and objectives clearly stated	Yes
Clear description of context	Yes
Clear description of methods used to collect and analyse data	Yes – comparative study
Attempts to establish reliability and validity of data analysis	Yes – pilot and double checking
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Yes
Rationale for numbers given	Not found
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	N/A

Quality of Study Summary Sheet

Study 3: One-to-One Midwifery – Second Cohort (Beake et al., 2001)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Yes
Aims and objectives clearly stated	Yes
Clear description of context	Yes
Clear description of methods used to collect and analyse data	Yes – prospective comparative study
Attempts to establish reliability and validity of data analysis	Yes
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Yes
Rationale for numbers given	Yes – power calculation
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	Yes – OR, regression analysis

Quality of Study Summary Sheet

Study 4: BUMPS Practice (Benjamin et al., 2001)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Yes – lit review
Aims and objectives clearly stated	Yes
Clear description of context	Minimal
Clear description of methods used to collect and analyse data	Yes prospective non-randomized trial
Attempts to establish reliability and validity of data analysis	Yes – validated tool
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Yes – external statistician
Rationale for numbers given	Yes – power calculation
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies	Yes – OR, some logistic regression

Quality of Study Summary Sheet

XStudy 5: KYM Team Practice (Flint and Poulengeris, 1987)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Yes + Appendix
Aims and objectives clearly stated	Yes
Clear description of context	Some
Clear description of methods used to collect and analyse data	Yes - RCT
Attempts to establish reliability and validity of data analysis	Yes
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Yes
Rationale for numbers given	Yes - feasibility
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	N/A

Quality of Study Summary Sheet

XStudy 6: Team Midwifery (Biro et al., 2000)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Yes – clear and concise
Aims and objectives clearly stated	Yes
Clear description of context	Yes
Clear description of methods used to collect and analyse data	Yes - RCT
Attempts to establish reliability and validity of data analysis	No information provided
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Yes
Rationale for numbers given	Yes – power calculation
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	Unclear

Quality of Study Summary Sheet

XStudy 7: Caseload Midwifery (The North Staffordshire Changing Childbirth Research Team, 2000)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Yes – clear and concise
Aims and objectives clearly stated	Stated but somewhat unclear
Clear description of context	Yes
Clear description of methods used to collect and analyse data	Yes – comparative study with area randomisation
Attempts to establish reliability and validity of data analysis	Yes
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Unclear
Rationale for numbers given	Yes – power calculation
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	Yes

Quality of Study Summary Sheet

XStudy 8: STOMP Community Care (Homer et al., 2001)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Clear and comprehensive
Aims and objectives clearly stated	Not explicit but implied
Clear description of context	Yes
Clear description of methods used to collect and analyse data	Yes - RCT
Attempts to establish reliability and validity of data analysis	Yes
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Yes –checks by researcher
Rationale for numbers given	Yes – power calculation
Appropriate statistical tests used (where relevant)	Yes – primary and secondary analysis completed
Attempt to control for confounders where relevant (e.g. epidemiological studies)	No information provided

Quality of Study Summary Sheet

Study 9: PHMC Partnership Caseload Midwifery Care (Johnson et al., 2005)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Comprehensive literature review
Aims and objectives clearly stated	Not explicit but evident in discussion section
Clear description of context	Yes
Clear description of methods used to collect and analyse data	Yes – comparative retrospective secondary analysis of routinely collected data
Attempts to establish reliability and validity of data analysis	Yes
Inclusion of sufficient original data to mediate between evidence and interpretation	N/A
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	N/A
Rationale for numbers given	Not addressed
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	N/A

Quality of Study Summary Sheet

XStudy 10: MDU Midwife-Managed Care (Turnbull et al., 1996)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Brief literature review
Aims and objectives clearly stated	Yes
Clear description of context	Adequate
Clear description of methods used to collect and analyse data	Yes – RCT - retrospective
Attempts to establish reliability and validity of data analysis	Yes – inter-rater reliability
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	N/A
Rationale for numbers given	Yes – power calculation
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	N/A

Quality of Study Summary Sheet

Study 11: BCG Birth Centre Midwifery (Waldenstrom et al., 1997)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Minimal
Aims and objectives clearly stated	Yes
Clear description of context	Yes
Clear description of methods used to collect and analyse data	Yes – RCT. Routinely collected data and surveys
Attempts to establish reliability and validity of data analysis	Yes
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Not addressed Independent review of perinatal death findings
Rationale for numbers given	Yes – length of trial extended to achieve adequate power
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	N/A

Quality of Study Summary Sheet

XStudy 12: Home from Home Scheme (MacVicar et al., 1993)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Minimal
Aims and objectives clearly stated	Yes
Clear description of context	Yes
Clear description of methods used to collect and analyse data	RCT - Brief description of data collection – routine data and survey none description of analysis but X^2 and Mann-Whitney U used
Attempts to establish reliability and validity of data analysis	No discussed
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Yes
Rationale for numbers given	Yes –discussed 2 to 1 for H from H to allow for transfers
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	N/A

Quality of Study Summary Sheet

XStudy 13: Midwife Team (Rowley et al., 1994)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Brief lit review
Aims and objectives clearly stated	Yes
Clear description of context	Minimal
Clear description of methods used to collect and analyse data	Yes – RCT stratified randomization - medical records and questionnaires
Attempts to establish reliability and validity of data analysis	Yes – previously tested questionnaires
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	No information
Rationale for numbers given	Feasibility but adequate power claimed
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies	Yes – logistic regression

Quality of Study Summary Sheet

XStudy 14: TMP Team (Kenny et al., 1994)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Comprehensive
Aims and objectives clearly stated	Implied but not specific
Clear description of context	Yes
Clear description of methods used to collect and analyse data	Yes – RCT – medical records and patient questionnaires
Attempts to establish reliability and validity of data analysis	Yes – previously tested questionnaires
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	No
Rationale for numbers given	Feasibility
Appropriate statistical tests used (where relevant)	Yes – clearly and comprehensively described
Attempt to control for confounders where relevant (e.g. epidemiological studies)	N/A

Quality of Study Summary Sheet

XStudy 15: Team Midwife Care (Waldenstrom et al., 2001)	
Criteria	**Assessment Result**
Explicit theoretical framework or literature review	Brief but adequate lit review
Aims and objectives clearly stated	Succinctly stated
Clear description of context	Minimal
Clear description of methods used to collect and analyse data	Yes – RCT – power calculation – medical records and follow-up questionnaire – analysis not discussed but statistical tests used listed
Attempts to establish reliability and validity of data analysis	Not discussed
Inclusion of sufficient original data to mediate between evidence and interpretation	Yes
Evidence of independence, steps to show against bias in data collection (e.g. who, when, how)	Yes
Rationale for numbers given	Yes – power calculation
Appropriate statistical tests used (where relevant)	Yes
Attempt to control for confounders where relevant (e.g. epidemiological studies)	N/A

APPENDIX B

Statistics for Reviewed Evaluations

Model	Strength	Selected Clinical Outcomes		
1. Albany Midwifery Practice(A) England (Sandall et al., 2001) (Reed (Reid), 2002)	**Albany=10** **Community=6** **Difference =4**		**Albany**	**Community Control**
		C/S[3]	18%	24%
		Induction[3]	5%	10%
		Augmentation[3]	0%	2%
		Epidural[3]	17%	25%
		Episiotomy (for vaginal deliveries)[3]	3%	9%
		Apgar[3]	NR	NR
		NICU Admissions[3]	NR	NR
2 & 3 One-to-One Midwifery(A) England (McCourt and Page, 1996) (Beake et al., 2001) (McCourt et al., 1998) (Page et al., 2001) (Stevens and McCourt, 2002a, Stevens and McCourt, 2002b, Stevens and McCourt, 2002c, Stevens and McCourt, 2002d) (Beake et al., 1998) (Beake et al., 2005) (McCourt and Stevens, 2005) (McCourt and Pearce, 2000)	**One-to-One=8** **Control=5** **Difference=3**	**First Report – 1996(B)**	**1 to 1**	**Standard Control**
		C/S2	19%	18%
		Induction (excluding pre-labour C/S)[2]	19%	22%
		Augment (Oxytocin)[2]	24%	33%
		Combined Spinal/Epidural[1]	52%	68%
		Episiotomy[1]	19%	30%
		Apgar < 7 @ 5 min[2]	0%	1 %
		Admissions to SCBU[2]	5%	5%
		Follow-up Report - 2001	**1 to 1**	**Standard Control**
		C/S[1]	20%	30%
		Induction (excluding pre-labour C/S)[2]	8%	9%
		Augment (Oxytocin)[2]	15%	22%
		CSE/Epidural (excludes all C/S)[1]	45%	69%
		Episiotomy (excludes all C/S)[1]	18%	35%
		Apgar < 7 @ 5 min[3]	1%	0%
		Admissions to NNU[3]	2%	1%
1%	**BUMPS=8** **Control=5** **Difference=3**		**BUMPS**	**Control**
		C/S2	15%	19%
		Induction (Elective C/S excluded)[2]	16%	23%
		Augment (Syntocinon) (Elective C/S excluded)[1]	14%	13%
		Epidural[1]	21%	32%
		Episiotomy[1]	6%	10%
		Apgar < 6 @ 5 min[2]	0%	
		NICU Admissions (NNU)[2]	3%	3%
5. KYM Team Practice England (Flint and Poulengeris, 1987) (Flint et al., 1989)	**KYM=6** **Control=3** **Difference=3**		**KYM**	**Control**
		C/S[2]	8%	7 %
		Induction (Elective C/S excluded)[2]	11%	13%
		Augment (Elective C/S excluded)[1]	17%	25%
		Epidural[1]	18%	30%

		Episiotomy (All C/S excluded)[1]	34%	42%
		Apgar <8 @ 5 min[1]	4%	1%
		Admissions to SCU[2]	5%	4%
6. Team Midwifery(B)(A) Australia (Biro et al., 2000) (Biro et al., 2001) (Hodnett, 2001)	**Team Midwifery=5** **Standard= 4** **Difference=1**		**Team**	**Standard**
		C/S[2]	22%	21%
		Induction (Elective C/S excluded)[2]	33%	29%
		Augment (Elective C/S excluded)[1]	26%	35%
		Epidural Analgesia (Elective C/S excluded)[2]	24%	33%
		Episiotomy (All C/S excluded)[1]	25%	35%
		Apgar < 7 @ 5 min[2]	3%	2%
		Admissions >5 days (SCN)[2]	20%	20%
7. Caseload Midwifery(A) England (The North Staffordshire Changing Childbirth Research Team, 2000)	**Caseload Midwifery=6** **Shared Care=4** **Difference=2**		**Caseload**	**Shared**
		C/S[2]	18%	17%
		Induction[2]	17%	18%
		Augmentation (Syntocinon)[1]	46%	53%
		Epidural[1]	10%	15%
		Episiotomy[2]	23%	24%
		Apgar[3]	NR	NR
		Admissions to Neonatal Unit[2]	6%	5%
8. STOMP Community Care(A) Australia (Homer et al., 2001) (Homer et al., 2002)	**STOMP=5** **Control=2** **Difference= 3**		**STOMP**	**Control**
		C/S[1]	13%	18%
		Induction[2]	23%	20%
		Augmentation[2]	41%	37%
		Epidural (+spinal block)[2]	28%	32%
		Episiotomy[2]	11%	12%
		Apgar < 7 @ 5 min[2]	2%	2%
		Admissions (SCN)[2]	14%	19%
9. PHMC(B) **Partnership Caseload Midwifery Care** Australia (Johnson et al., 2005)	**PHMC=6** **Control=4** **Difference=2**		**PHMC**	**Control**
		C/S [2]	8%	11%
		Induction (ARM + Oxytocin Excludes no labour group)[1]	36%	45%
		Augmentation[2]	17%	21%
		Epidural (In labour)[2]	11%	12%
		Episiotomy[2]	27%	27%
		Apgar < 7@ 5 min[2]	2%	3%
		ICN & SCN Admissions[2]	6%	5%
10. MDU Midwife-Managed Care(B) Scotland (Turnbull et al., 1996) (Turnbull et al., 1999) (Shields et al., 1998) (Shields et al., 1999) (Young et al., 1997) (Cheyne et al., 1995)	**MDU=3** **Shared=2** **Difference=1**		**MDU**	**Shared**
		C/S [2]	12%	11%
		Induction[1]	24%	33%
		Augmentation[2]	43%	40%
		Epidural[2]	33%	34%
		Episiotomy[1]	28%	34%
		Apgar <8 @ 5 min[2]	2%	3%
		SCBU Admissions[2]	8%	10%
11. BCG Birth Centre Midwifery(B)	**BCG=3**		**BCG**	**SCG**
		Total C/S[2]	7%	9%

Sweden (Waldenstrom and Nilsson, 1993) (Waldenstrom and Nilsson, 1994) (Waldenstrom et al., 1997) (Gottvall et al., 2005) (Waldenstrom, 1998)	**SCG=1** **Difference=2**	**Induction Oxytocin[2]**	3%	5%
		Augmentation[1]	32%	52%
		Epidural block[2]	12%	15%
		Episiotomy[2]	8%	8%
		Apgar <7 at 5 min[2]	1%	1%
		Neonatal care admits[2]	19%	17%
12. Home from Home Scheme England (MacVicar et al., 1993)	**Home-Home=3** **Home-Home Control=3** **Difference=0**		**Home- Home**	**Control**
		C/S[2]	7%	7%
		Induction[3]	9%	11%
		Augmentation[3]	12%	16%
		Epidural (alone or in combination)[3]	16%	20%
		Episiotomy (excludes C/S)[3]	23%	31%
		Apgar median @ 5 min[2]	9	9
		Retained in neonatal unit[2]	1%	2%
13. Midwife Team(B)(A) Australia (Rowley et al., 1995) (Rowley et al., 1994)	**Midwife Team=3** **Team Midwife Routine = 2** **Difference=1**		**Midwife Team**	**Routine**
		C/S[2]	13%	14%
		Induction[2]	14%	17%
		Augmentation[2]	29%	25%
		Epidural Anaesthesia[2]	17%	32%
		Episiotomy[2]	11%	14%
		Apgar <7 @ 5 min[2]	2%	2%
		NIC Admits[2]	4%	5%
14. Team Midwifery Project(A) Australia (Kenny et al., 1994)	**TMP Team=4** **TMP Conventional =2** **Difference=2**		**TMP**	**Conventional**
		C/S[2]	12%	13%
		Induction[2]	21%	20%
		Augmentation[2]	18%	17%
		Epidural[2]	27%	31%
		Episiotomy[1]	10%	26%
		Apgar <7 @ min[2]	4%	0%
		Admit to NIC/SCN >4 hrs[1]	8%	15%
15. Team Midwife Australia (Waldenstrom et al., 2001)	**Team Midwife Team=3** **Midwife Standard=3** **Difference=0**		**Team Midwife**	**Standard**
		C/S[2]	12%	12%
		Induction[2]	34%	32%
		Augmented labour[2]	26%	28%
		Epidural[2]	30%	32%
		Episiotomy (C/S excluded)[2]	33%	33%
		Apgar <7 @ 5 min[2]	2%	1%
		Admissions to SCN[2]	10%	8%

All outcomes measures are rounded out to the nearest whole number
All percentages are for all subjects unless otherwise indicated
(A) Includes women at low and high risk of complications
(B) Some or all results were reported for subgroups and/or as raw data and have been converted to total percentages
C/S Caesarean Section
[1] Statically significant difference
[2] No statistically significant difference
[3] Statistical significance unknown

APPENDIX C

Satisfaction Outcomes for Reviewed Evaluations

No	Models, Citations & Strength Scores	Satisfaction
1	**Model** **Albany Midwifery Practice, England** **Citations** **(Sandall et al., 2001) (Reed (Reid), 2002) (Reed, 2002) (Leap et al., 2008)** **Strength Score** **Albany = 10 Community Standard = 6 Hospital Standard = 4**	Analysis using descriptive statistics was carried out on data from the standard Maternity Services Satisfaction Questionnaire sent to 299 women who had hospital births, 42 women who had home births and 106 women who were cared for by Albany midwives. Multiple qualitative variables are reported on women's evaluation of care during pregnancy, labour and birth and hospital postnatal care. Only those where a statistically significant difference was reported are summarized here.

	Albany	Comm Standard	Hosp Standard
Pregnancy – patterns of AN care			
Saw MW first when pregnant	16%	2%	5%
Had 1st AN visit at home	34%	4%	10%
Have any AN visits in hospital	42%	77%	71%
Have any AN visits at home	89%	44%	42%
Wait more than 30 min at hosp	30%	58%	62%
Wait more than 30 min at community	17%	36%	31%
Pregnancy – access to care providers			
Given number of named MW	84%	34%	49%
Given number to contact labour ward	24%	52%	49%
Given GP surgery number	20%	37%	36%
Able to contact MW easily	86%	51%	53%
Contacted particular MW if worried	82%	37%	47%
Informed choice in pregnancy and childbirth			
Given choice of RM, MD or shared AP caregiver	49%	68%	70%
Given choice of birth attendant	76%	38%	40%
Choice of place of birth			
Offered hospital birth	95%	81%	84%
Offered home birth	90%	72%	84%
Involved in decision re birth location	97%	80%	83%
Given right amount of time to discuss birth plans	92%	72%	76%
Information given in pregnancy			
Given Maternity Services leaflet	18%	27%	22%
Given Guide to Services	20%	43%	33%

leaflet		
Given Trust Information Guide	27%	44%	41%
Given info. re. foods to avoid	69%	92%	80%
Feel clinic waiting times need improving	40%	67%	62%
Feel arrangements for US need improvement	27%	11%	15%
Feel staffing levels need improving	17%	39%	30%
Feel timing of clinics need improving	2%	14%	14%
Staff attitudes in pregnancy			
Felt staff kind	78%	53%	62%
Felt staff warm	75%	56%	64%
Felt staff rushed	2%	25%	14%
Care during pregnancy			
Given info. on monitoring baby at home	96%	73%	83%
Given info. on emergency services	96%	50%	71%
Continuity of Caregiver in labour and birth			
Knew birth attendant	98%	86%	81%
Knew a birth attendant well	92%	52%	48%
Pain relief in labour			
Did not need pain relief	49%	15%	24%
Offered adequate pain relief	47%	79%	70%
Hospital postnatal care			
Not met any MWs before	43%	69%	63%
Postnatal care at home			
Had visit from MW on first day home	32%	17%	17%
Had visit every day for first10 days	28%	13%	17%
MW visits at specified time	65%	32%	35%
Had all home visits by same MW	26%	16%	18%
Had met all visiting MWs before	93%	63%	57%

In summary, satisfaction was not specifically reported on but two processes of care were chosen against which to assess whether the aims of the Albany model had been achieved. The two processes chosen were levels of continuity and provision of informed choice

With regard to continuity it was reported that continuity of caregiver was achieved though pregnancy and the puerperium and almost all women receiving care from Albany midwives were attended by their primary midwife or another Albany midwife during childbirth. Albany women were more aware of how to contact their midwife and rated the Albany midwives as kinder and warmer. Albany women found the model more accessible and were more likely to seek a midwife when first pregnant, to plan a home birth and have antepartum care shared between a general practitioner and midwives. They were more likely

		to have specified appointments and call their midwife if they had a problem compared with other women. Women reported no difference between models of care for information received during pregnancy but Albany women reported less choice in who provided their antenatal care and more choice of who would attend their birth. All women reported high levels of choice when deciding where to give birth but Albany women felt more involved in making the decision. Albany women felt their midwives had more time to discuss issues and those who birthed at home were more informed about the issues of home birth. Overall, more women wanted information about childbirth complications and Albany women would have liked more information about tests performed on their babies.
2 & 3	**Model** **One-to-One Midwifery, England** **Citations** **(McCourt and Page, 1996) (Page et al., 1999) (Beake et al., 2001) (McCourt et al., 1998) (Page et al., 2001) (Stevens and McCourt, 2002a) (Stevens and McCourt, 2002b) (Stevens and McCourt, 2002c) (Stevens and McCourt, 2002d) (McCourt and Stevens, 2005) (Beake et al., 1998)** **Strength Score** **One-to-One = 8** **Standard = 5**	First Cohort - 1994 -1995 An evaluation of women's responses was conducted to assess their satisfaction with 1-to-midwifery care. The study consisted of a longitudinal survey based on self-completion questionnaires administered at 35 weeks (291 and 404 returned) gestation and at 2weeks (284 and 345 returned) and 13 weeks (258 and 334 returned) postnatally. In addition, semistructured interviews and focus groups were conducted to check the validity of the questionnaires, obtain a greater depth of response and to test whether the areas of interest in the study were those spontaneously identified by women as important. Data from closed questions were analyzed to produce descriptive statistics but tests of significance were not used as data from the comparison group were regarded as primarily contextual. Data from interviews and from open-ended questions, which were analyzed by an independent researcher, are not reproduced here as they were similar to those found in the questionnaire responses Selected results from the close-ended questionnaire survey are presented here.

	1-to1	Standard
Experience of Antenatal Care		
Had most visits at home	77%	23%
Wait times too long	1.4%	7.3%
Saw same caregiver each visit	85%	54%
Encouraged to ask questions	89%	75%
Knew main caregiver very well	16%	3.7%
Relationship with main caregiver was close	6%	1%
Used positive words to describe main caregiver	6%	4%
Felt very well prepared for birth	17%	12%
Planned to fully breastfeed	77%	80%
Experience of Labour and Birth Care		
Felt very well prepared for labour	40%	30%
Experienced difficulty contacting a health professional	6%	2%
Had same midwife throughout L & B	90%	53%
Encouraged to move and change position	79%	63%
Had a 'lot' or 'quite a few' people coming in and out during labour	26%	37%
Felt staff listened enough	88%	83%
Felt staff explained enough	91%	87%
Managed very well during L & B	41%	36%

Were very satisfied overall with L & B care	79%	71%
Experience of Postpartum Care (Hospital)		
Able to get all help needed with breastfeeding	50%	52%
Able to get all help needed from staff	52%	57%
Were confused by conflicting advice from staff	19%	28%
Felt neglected or overlooked by staff often	11%	8%
Were very satisfied overall with PP hospital care	50%	54%
Experience of Postpartum Care (Home)		
Knew all midwives who visited from before birth	71%	7%
Felt relationship with most frequently visiting midwife was close	19%	5%
Most frequently attending midwife was also at birth	74%	8%
Were very satisfied overall with PP home care	85%	74%
Experience of Postpartum Care (General)		
Breast fed only at 13 weeks	42%	39%
Felt a good mother at 13 weeks	96%	96%
Enjoying breastfeeding at 13 weeks	71%	75%
EPDS at 13 weeks	6	6
Overall Experience of Care		
Were very satisfied overall with care throughout AP, IP and PP	73%	45%

In summary, women receiving 1-1 care experienced greater continuity of care and had more positive views on the care they received than women who received standard care. Women receiving 1-to-1 care expressed a fairly high level of satisfaction with antenatal care but had mixed views on intrapartum and postpartum care, depending on the location in which the care was provided. Care provided in the home was rated as more satisfactory than care provided in the hospital. There was some evidence that I-to-1 care may increase self esteem and confidence, particularly in caring for a new baby,

Second Cohort 1997-1998

The purpose of the second cohort study was to determine whether apparent positive changes in the first cohort study had been the result of the first flush of enthusiasm or had persisted when 1-1 care was established. Satisfaction was measured with the same self completion questionnaires used in the first cohort study but as the responses to first and second postpartum questionnaires were consistent in the first study, only the 35 week gestation and one postpartum questionnaire at 1 month after birth were used. A total of 676 women responded to the questionnaire; 263 received 1-to-1 care and 413 received standard care. A summarized table of the satisfaction responses for the first and second cohort studies is presented herd here.

Satisfaction with Care					
Aspect	**Level**	**First Cohort**		**Second Cohort**	
		1-to-1	**Standard**	**1-to-1**	**Standard**
Prepared for birth	Very well	40%	30%	37%	30%
Care during labour	Very satisfied	80%	71%	89%	62%

Hospital care after birth	Very satisfied	51%	54%	54%	40%
Home care after birth	Very satisfied	85%	74%	88%	77%
Looking after baby	Very confident	51%	38%	53%	38%
Prepared for baby's arrival	Well	53%	40%	51%	44%

Overall women in the second cohort reported levels of satisfaction with 1-to-1 care similar to those found in the first cohort but reported stronger perceptions of personal control and higher confidence levels. Women receiving standard care reported somewhat lower levels of information, professionals listening to them, continuity and community-based care. Levels of satisfaction with PP hospital care, which were low for both groups in the first cohort continued low in the second cohort but 1-to-1 women were more satisfied than women in the first cohort and women receiving standard care were even less satisfied in the second than in the first cohort.

4

Model

Birth Under Midwifery Practice Scheme (BUMPS), England

Citations

(Benjamin et al., 2001)
(Walker J, 1999)
(Walsh, 1999)

Strength Score

BUMPS = 8
Control = 5

The authors did not specifically evaluate women's satisfaction with the care they received in the study; however, an ethnographic study was carried out to explore the experience of women receiving care from BUMPS' midwives who had previously had a baby under an alternative care system. Data were collected by tape-recorded interviews of ten multiparous women cared for by BUMPS midwives between eight and 12 weeks postpartum. Interviews were transcribed in full and data categorized using a constant comparison process. Although continuity of care was the focus of the ethnographic study, it was not found to be a primary theme. The three primary themes identified are summarized here.

Primary Themes	Characteristics
Woman/ Midwife Relationship	❖ friendship with midwife ❖ use of midwives names ❖ known midwife for antenatal care (Mary was) ❖ personalization of birth experience reflections (I was) ❖ delight and gratitude for childbirth experience ❖ difficulty ending relationship with midwife
Previous Experience of Childbirth	❖ powerful, negative experience of maternity care in hospital ❖ critical, depersonalized statements about caregivers
Aspects of BUMPS Scheme	❖ home antenatal care ❖ involvement of partners/children

In summary, partnership, caseload midwifery practice was found to have a significant, positive impact on women's experience of childbirth.

5

Model

KYM Team Practice, England

Citations

(Flint and Poulengeris, 1987)
(Flint et al., 1989)

Strength Score

KYM = 6
Standard = 3

Satisfaction was reported quantitatively in terms of continuity and women's views regarding the care model they had received using data from questionnaires administered at 37 weeks gestation, 2 days postpartum and 6 weeks postpartum. Results were presented as the percent of women who were satisfied with different aspects of the care provided

Item	KYM	Standard
Continuity		
Had less than 8 caregivers in pregnancy	79%	49%^
Had less than 3 MWs in labour	69%	48%
Had less than 3 MDs in labour	88%	76%
Met birth attendant in pregnancy	98%	0%^
Satisfaction		
Waited less than 15 mins in clinic	61%	7%^
Felt well prepared for labour	52%	40%^
Experienced enjoyment during labour	42%	32%^
Felt in control in labour	42%	24%^
Satisfied with pain relief*	58%	51%
Felt well prepared for child care	43%	29%^
Felt able to discuss problems PP	64%	51%^
Rated staff in labour as 'very caring'	92%	81%^

*= Based on women who had normal deliveries
^= Significant difference at 99% confidence

Overall based on qualitative data from open ended questions on the questionnaires, KYM women felt more satisfied better prepared and better able to discuss problems than women receiving standard care.

6

Model

Team Midwifery, Australia

Citations

(Biro et al., 2000)
(Biro et al., 2001)
(Biro et al., 2003)
(Hodnett, 2001)

Strength Score

Team = 5
Standard = 4

Satisfaction data were collected for 345 women who received team midwifery care and 288 women who received standard care in a randomized controlled trial by a questionnaire mailed to them 4 months after birth. The difference between the questionnaire return rate of the two groups (team =70%, standard =58%) was statistically significant. The purpose of the questionnaire was to assess the impact of the team midwifery model of practice on women's views and experiences of care during the antenatal, intrapartum and postpartum periods by comparing them with the views and experiences of women who received standard care. The questionnaire measured women's responses to questions about different aspects of their antenatal, intrapartum and postpartum care on a 7-point scale ranging from disagree strongly to agree strongly. A summary of the responses for those aspects where a significant difference was found when scores of 6 or 7 (positive items) and 1 and 2 (negative items) were compared with all other scores using X^2 is presented here.

Item	Disagree strongly		Agree strongly	
	Team	Standard	Team	Standard
Satisfaction with Antenatal Care				
Opportunity to ask questions	1%	2%	73%	52%
Caregivers very rushed	29%	14%	5%	13%
Concerns taken seriously	3%	4%	52%	28%
Kept informed	1%	1%	64%	40%
Happy with physical care	1%	3%	59%	34%
Happy with emotional support	1%	5%	52%	28%
Overall pregnancy care (v. poor to v. good)	1%	2%	57%	35%

		Satisfaction with Intrapartum Care
		Kept informed: 2% / 2% / 55% / 38% Active participation in decision making: 2% / 2% / 48% / 35% Encouraged and reassured: 1% / 2% / 63% / 50% Caregivers very rushed: 40% / 30% / 9% / 12% Happy with physical care: 2% / 3% / 54% / 39% Happy with emotional support: 2% / 3% / 59% / 43% Privacy well respected: 2% / 2% / 64% / 48% Overall L & B care (v. poor to v. good): 1% / 2% / 22% / 29% **Satisfaction with Postpartum Care** Caregivers sensitive and understanding: 3% / 4% / 36% / 26% Caregivers very rushed: 22% / 11% / 14% / 21% Happy with physical care: 2% / 5% / 39% / 30% Happy with emotional support: 3% / 7% / 39% / 25% Overall women were clearly more satisfied with team midwifery care than standard care in the AP period ($p<0.001$) than the IP period although women remained more satisfied with team midwife care during L & B ($p<0.01$). There was no difference in women's overall satisfaction with care in hospital in the PP period. No evaluation of care provided in the home is reported.
7	**Model** **Caseload Midwifery, England** **Citations** **(The North Staffordshire Changing Childbirth Research Team, 2000)** **Strength Score** **Caseload = 6** **Standard = 4**	Data on maternal satisfaction were collected by questionnaires soliciting women's views on the care they received but at the time of publication the data had not yet been analysed. The authors stated they planned to publish the results of the satisfaction analysis at a later date but no such publication could be found. Continuity of care was evaluated with 95% of women who received care from caseload midwives and 7% of women who received standard care being attended at birth by a known midwife ($p<0.001$).
8	**Model** **STOMP Community Care Australia** **Citations** **(Homer et al.,**	In order to compare women's experiences with care during childbirth, a nine page questionnaire was mailed to 550 women randomized to care by STOMP midwives and 539 women randomized to standard care 8 to10 weeks after birth. The questionnaire was designed to assess how women rated their opportunity to discuss their preferences, the amount of information they had received, their experience of childbirth and their sense of personal control during labour. Women were also asked to make positive or negative comments related to their maternity care experiences. In a secondary analysis to assess the level of continuity of care in both groups 63% of women in the STOMP group and 21% of women in the standard care group reported they had a midwife they felt they knew at their birth ($p <0.0001$) and 21% of the STOMP group and 12% of the standard group had one midwife

<table>
<tr><td></td><td>2001)
(Homer et al., 2002)

Strength Score

STOMP = 6
Standard = 2</td><td>care for them throughout labour and birth (p =0.01).

Although no numbers or percents are reported for ratings of childbirth experience and sense of control it is reported that there was no significant difference between groups for rating of childbirth experience but that women in the STOMP group reported a significantly higher sense of control during labour and birth (p =0.005). 31% of women in the STOMP group and 22% of women in the standard care group made positive comments about their care. No indication of the total number of negative comments is reported but it is reported that the greatest number of negative comments were related to postnatal care with 17% of STOMP and 23% of standard care women making specific negative comments related to postnatal care, particularly inconsistent advice, lack of support and lack of follow- up.

A summary of findings where a significant difference was found for opportunity to discuss preference and the amount of information received is presented here.

<table>
<tr><th>Item</th><th>STOMP</th><th>Standard</th></tr>
<tr><td colspan="3">Opportunity to discuss preferences</td></tr>
<tr><td>Talked a lot</td><td>29%</td><td>18%</td></tr>
<tr><td colspan="3">Wanted more Information</td></tr>
<tr><td>Pain relief options</td><td>18%</td><td>33%</td></tr>
<tr><td>Induction of labour</td><td>37%</td><td>51%</td></tr>
<tr><td>Caesarean Section</td><td>44%</td><td>49%</td></tr>
<tr><td>Complications in labour</td><td>49%</td><td>57%</td></tr>
<tr><td>Infant feeding</td><td>36%</td><td>40%</td></tr>
</table>

Overall, the findings demonstrate that the STOMP model was associated with more positive experiences of childbirth and that women who received care from STOMP midwives had a significantly higher sense of control during labour and birth than women who received standard care. Women receiving care from STOMP midwives also felt more able to discuss their preferences for labour and birth with their caregivers and were better informed about various aspects of labour and birth.</td></tr>
<tr><td>9</td><td>Model

PHMC Partnership Caseload Midwifery Care Australia

Citations

(Johnson et al., 2005)

Strength Score

PHMC = 6
Standard = 4</td><td>Satisfaction reported (according to the unmentionable Cochrane review) in :

Johnson, M, Stewart, H, Langdon, R Kelly. P and Yong,l ((2003) Women-control care and caseload models of midwifery. Collegian, 10(1), 30-34

Unable to locate this Journal.</td></tr>
<tr><td>10</td><td>Model

MDU Midwife-Managed Care</td><td>Six hundred and forty-eight women who were randomized to midwife care-managed care and 651 who were randomized to shared care were mailed three self-report questionnaires, two at 34-35 weeks gestation and the third at seven weeks postpartum to collect data related to four dimensions of</td></tr>
</table>

	Scotland **Citations** **(Turnbull et al., 1996)** **(Turnbull et al., 1999)** **(Shields et al., 1998)** **(Shields et al., 1999)** **(Young et al., 1997)** **(Cheyne et al., 1995)** **Strength Score** **MDU = 4** **Standard = 3**	satisfaction across four time periods of their childbirth experience using a 5-point Likert scale and open-ended questions. A smaller consecutive sample of women was also sent questionnaires at 7 months postpartum. The questionnaires were developed on the basis of a literature review and unstructured interviews with women and hospital staff to measure satisfaction with relationships with staff, information transfer, choices and decisions and social support. Mean scores were derived for each dimension with a possible range from -2 (very negative) to 2 (very positive). Statistical analysis was carried out using t-tests to compare means and X^2 to compare results of open ended questions. Women who received midwife-managed care were more highly satisfied with all dimensions of satisfaction throughout all periods of care, most markedly for antenatal and hospital based postpartum care. The results of the open-ended questions showed both groups were more likely to make positive rather than negative questions throughout all periods of care although women who received midwife-managed care recorded more comments related to what they liked, whereas women who received shared care documented more comments in relation to what the disliked. A summary of the statistically significant mean differences is presented here. **Satisfaction Dimension** / **Midwife** / **Share** Relationship with staff: 1.56 / 0.80 Information transfer: 1.25 / 0.88 Choices and decisions: 1.03 / 0.60 Social Support: 1.18 / 0.80 In summary, women in both the midwife-managed and the shared care groups were satisfied with the four dimensions of care examined. However the women in the midwife managed group were found to be more highly satisfied. The difference between groups was evident for the antepartum, intrapartum and postpartum periods and was sustained until the 7 month follow-up. Women in the midwife-managed group were more likely to make positive rather than negative comments while women in the shared care group were more likely to make negative comments.
11	**Model** **BCG Birth Centre Midwifery Sweden** **Citations** **(Waldenstrom and Nilsson, 1993)** **(Waldenstrom and Nilsson, 1994)** **(Waldenstrom et al., 1997)** **(Gottvall et al., 2005)** **(Waldenstrom, 1998)** **Strength**	This evaluation compared women's satisfaction with care received from midwives in an in-hospital birth centre with women who received care from midwives who were supervised by physicians in the regular delivery ward one storey above. For the 617 women who were randomized to the experimental group received birth centre care and the 613 women randomized to the control group received standard obstetric care, data were collected from three self-completed questionnaires. Responses to questions on the questionnaires were by 7-point Likert scale except for two questions about the advantages and disadvantages of birth centre care. The first questionnaire was completed by women before randomization and by mail at one month before term and two months after the expected date of delivery. Data were analysed using X^2 and Mann-Whitney U tests. Only those where a statistically significant difference was reported are summarized here. **Item** / **Birth Centre** / **Standard** **Satisfaction with Care** Antepartum: n=483 / n=554 Physical aspects: 6.3 / 5.7 Psychological aspects: 6.5 / 5.0 Comprehensive assessment: 6.5 / 4.9 Intrapartum: n=574 / n=534 Physical aspects: 6.5 / 6.0

	Score **BCG = 3** **Standard = 1**	Psychological aspects	6.3	5.5
		Comprehensive assessment	6.5	5.9
		Postpartum Care	n=556	n=479
		Physical aspects	6.1	5.0
		Psychological aspects	5.9	4.5
		Comprehensive assessment	6.0	4.9
		Women's Opinions about Birth Centre Routines		
		Same premises AP, IP & PP	6.8	6.5
		Early discharge	5.6	5.0
		Home visits	6.5	6.3
		Antenatal transfer	4.8	4.3
		Intrapartum transfer	5.0	4.2
		No routine US	4.0	3.5
		No EFM in labour	5.7	4.4
		No epidural	5.5	4.7
		No paracervical	5.5	4.7
		No pethidine	5.7	4.9
		No pudendal	5.5	4.7
		No Entonox	5.1	3.9
		Women's Opinions of Birth Centre Routines		
		Advantages	n=579	n=489
		Content of care	61%	27%
		Environment	48%	36%
		Same premises	35%	15%
		Family together	20%	13%
		Qualities of personnel	19%	4%
		Small scale	11%	3%
		Disadvantages		
		Transfer System	31%	42%
		Other disadvantages	19%	5%
		Overall, birth centre women expressed greater satisfaction with antenatal, intrapartum and postpartum care than with women who received standard obstetric care. The difference between the two groups was most pronounced with respect to the psychological aspects of care. The authors of the study stated they were unable to identify which specific characteristics of birth centre care contributed to the higher degree of satisfaction in the experimental group but concluded that birth centre care successfully meets the needs of women who are interested in natural birth and active involvement and who are concerned about the psychological aspects of birth.		
12	**Model** **Home from Home Scheme England** **(MacVicar et al., 1993)** **Citations** **Strength Score**	Satisfaction data were collected by a postnatal questionnaire sent approximately six weeks after birth to 2304 women who had been randomized to a simulated home delivery in hospital and 1206 women who were randomized to standard consultant led care. Although not specifically stated, the questionnaire appears to have been a part of the standard medical casenotes and covered a variety of aspects of care and attitudes of staff before, during and after birth. The authors reported on two questions which asked women how satisfied they were with (1) their antenatal care and (2) their care during labour and delivery. The questionnaire provided five response options indicating whether they were very satisfied/fairly satisfied//neither satisfied or dissatisfied/fairly dissatisfied/very dissatisfied with the care they received. Using a Mann Whitney test to compare women who were very satisfied, women receiving the Home-from-Home scheme were significantly more satisfied with care than women receiving standard		

	H – H = 3 **Standard = 3**	medical care. Details of the distribution of responses are presented here. **Item** / **Home from Home n=1663** / **Standard n=826** **Satisfaction with Antenatal Care** Very satisfied: 52% / 44% Fairly satisfied: 42% / 47% Neither: 3% / 5% Fairly dissatisfied: 3% / 2% Very dissatisfied: 0% / 1% **Satisfaction with Hospital Care** Very satisfied: 73% / 60% Fairly satisfied: 21% / 31% Neither: 3% / 4% Fairly dissatisfied: 2% / 3% Very dissatisfied: 1% / 2% Generally higher levels of satisfaction with care antenatally and during labour and delivery were shown in women allocated to care in the Home from Home scheme.
13	**Model** **Midwife Team Australia** **Citations** **(Rowley et al., 1995)** **Strength Score** **Midwife Team = 3** **Routine Care = 2**	To measure maternal satisfaction, self-administered questionnaires (based on previously published questionnaires modified for use with Australian women) were completed antenatally and at two days and six weeks after delivery by 405 women randomized to team midwifery care and 409 women randomized to routine care. The authors do not describe the questionnaires. Effects of treatment were estimated by calculating odds ratios and their 95% confidence intervals. The authors report that women who received team care were more satisfied with their experience and had higher scores for three elements of satisfaction: information- giving, participation in decision making and relationships with caregivers. Information-giving included feeling encouraged to ask questions, being given answers which they could understand and feeling able to discuss anxieties. Participation in decision making included available choices being explained and being able to participate in decision making. Relationships with caregivers included midwives always being friendly and interested in them as a person.
14	**Model** **TMP Team Australia** **Citations** **(Kenny et al., 1994)** **Strength Score** **TMP =4** **Conventional = 2**	Two client satisfaction questionnaires, designed especially for the evaluation and based on questionnaires used previously in evaluations of midwifery, were distributed to 194 women randomized to team midwifery care and 211 women randomized to usual hospital care for completion by 36 weeks gestation and during the first week after birth. The first questionnaire consisted of 43 items which asked about satisfaction with antenatal care. Satisfaction items had ordinal response scales with 3, 4, 5 or 6 response categories. Several other questions which applied to medical and midwifery care required two responses for a total of 57 items overall. The second questionnaire consisted of 54 items. Response scales for 4 or 5 point ordinals or dichotomous variable responses were used to collect data on satisfaction with labour, birth and the postpartum period. Client satisfaction scores were aggregated into summary scores for antenatal satisfaction data, birth satisfaction data and postnatal satisfaction data. Data were analysed using X^2, Fisher's Exact test, t-test and Wilcoxon rank-sum test. Satisfaction outcomes where a significantly different outcome was reported are presented here. **Dimension of care (possible range)** / **TMP** / **Usual** **Satisfaction with Antenatal Care**

Carer skill, attitude and communication (0-60)	57.1	47.7
Convenience/waiting (0-18)	14.7	10.9
Asking questions (0-12)	8.5	6.9
Satisfaction with Care during Labour/birth		
Information/communication (0-30)	28.3	24.8
Coping with labour (0-30)	20.9	19.3
Midwife skill/caring (0-24)	22.7	21.3
Satisfaction with Postnatal Care		
Midwife skill and communication (0-18)	16.6	15.4

In summary, women reported significantly higher levels of satisfaction with care in the antenatal, delivery and postnatal periods. Satisfaction with information and communication and satisfaction with midwife skill and attitude showed the greatest differences. The researchers identify differences with antenatal care and care during labour and birth as the most important differences.

15

Model

Team Midwife Care Australia

Citations

(Waldenstrom et al., 2000) (Waldenstrom et al., 2001)

Strength Score

Team Midwife = 3
Standard = 3

Satisfaction and content of care, including continuity, data was collected for 495 women randomized to team midwife care and 505 women randomized to standard care by a questionnaire posted to them two months after birth. The questionnaire included questions about satisfaction with antepartum, intrapartum and postpartum care which were extracted from a recent survey of Australian women. It also included questions about pregnancy and birth and questions from the Edinburgh Postpartum Depression Scale. A 7-point scale ranging from (1) "disagree strongly" to (7) "agree strongly" was used for rate responses to statements about the experience of care. Data were analyzed with percentage differences being estimated by the normal approximation of the binomial with Yates correction for continuity. Contingency tables were tested by the X^2 function and Student's t test was used for comparison of means. A summary of those content of care and satisfaction outcomes that were reported to have a significant difference between groups are summarized here.

Content of Care		
Care Characteristics	**Team**	**Standard**
Number of antenatal visits, mean		
with doctor	1.4	6.7
with midwife	6.3	3.5
with midwife and doctor	2.5	0.2
with midwife consulting with doctor	0.8	0.2
total	11.1	10.5
Number of antenatal caregivers, mean		
doctors	2.4	3.0
midwives	5.6	3.2
Waiting time at antenatal visits, mean		
to see a doctor, min	31.9	66.5
Seen in labour by midwife, seen antenatally	65%	8%
Team midwife present		
during labour	82%	14%
during birth	75%	14%
Seen postnatally by midwife, seen antenatally, or in labour	74%	37%

Satisfaction with Antenatal Care				
Statement assessed	**Team**		**Standard**	
	Disagree strongly	**Agree strongly**	**Disagree strongly**	**Agree strongly**

Kept informed and effort made to explain	2%	48%	2%	32%
Active say in decisions	1%	45%	1%	39%
Caregivers encouraging and reassuring	0%	60%	1%	39%
Caregivers very rushed	38%	3%	15%	17%
Care provided in safe and competent way	0%	57%	1%	39%
Happy with physical aspects of care	1%	53%	1%	36%
Happy with emotional support	1%	53%	3%	32%
Overall care very good	0%	58%	1%	40%
Satisfaction with Intrapartum Care				
Kept informed and effort made to explain	2%	52%	2%	40%
Active say in decisions	1%	47%	3%	37%
Caregivers sensitive and understanding	2%	57%	1%	39%
Caregivers encouraging and reassuring	1%	60%	1%	44%
Caregivers very rushed	42%	4%	33%	8%
Care provided in safe and competent way	1%	65%	2%	49%
Happy with physical aspects of care	2%	59%	3%	43%
Happy with emotional support	2%	59%	3%	44%
Privacy needs were respected	1%	64%	2%	48%
Satisfaction with Postnatal Care				
Kept informed and effort made to explain	4%	35%	6%	27%
Caregivers sensitive and understanding	2%	35%	5%	28%
Caregivers encouraging and reassuring	1%	35%	5%	28%
Caregivers very rushed	18%	16%	12%	19%
Happy with physical aspects of care	3 %	39%	6%	30%

Overall, team midwife care was associated with increased satisfaction, most noticeably in the antepartum period, less noticeably in the intrapartum phase and least noticeably in the postpartum period. The principal difference in intrapartum care, between the two groups, was continuity of caregiver. The authors conclude that the data suggest satisfaction with intrapartum care is related to continuity of care.

APPENDIX D

STRENGTH OF MODELS

1 ALBANY MIDWIFERY PRACTICE (Sandall)	
Element	**Score**
Partnership Partnership embedded in philosophy Midwife only care provided by midwives Named midwife	2
Continuity Each woman is cared for by one known midwife throughout pregnancy, birth and postpartum with second known midwife as backup. 24 hour call provided	2
Autonomy Self employed under contract. Self-managed. No physician supervision	2
Community Clinic in Community Centre. Link to obstetrician Access to community health resources	2
Choice Aim to provide 'choice and control' Choice of home and hospital birth	2
TOTAL	**10**

ALBANY COMPARISON GROUP COMMUNITY(Sandall)	
Element	**Score**
Partnership 9 other community based midwifery practices in the same geographic area as Albany Assumed UK Standard for District Midwives	1
Continuity Community based District Midwives	1
Autonomy Assumed employed by NHS Assumed self-governing professionals	1
Community Based Assumed community based district midwives	2
Choice Assume UK standard for informed choice Choice of home and hospital birth	1
TOTAL	**6**

2 & 3 ONE-TO-ONE MIDWIFERY (McCourt)	
Element	**Score**
Partnership Named midwife Midwives sensitive to women's needs and choices	2
Continuity 1-1 care by named midwife and partner 24 hour call provided	2
Autonomy Employed by NHS Personal Caseload	1
Community Midwives based at home but office provided at hospital 3 routine hospital antenatal visits	1
Choice Midwives sensitive to individual needs and choices of women Choice of home and hospital birth	2
TOTAL	**8**

ONE-TO-ONE MIDWIFERY COMPARISON GROUP (McCourt)	
Element	**Score**
Partnership Assume UK Standard	1
Continuity Assume UK Standard	1
Autonomy Assume employed by NHS Assume self-governing professionals	1
Community Assume UK standard	1
Choice Assume UK standard for informed choice Choice of home and hospital	1
TOTAL	**5**

4 BUMPS PRACTICE (Benjamin)	
Element	**Score**
Partnership Known midwives working in pairs. Aim of practice for women to get to know her midwives	2
Continuity Each woman is cared for by one known midwife throughout pregnancy, birth and postpartum with second known midwife as backup. 24 hour call provided	2
Autonomy Primary care providers Employed by NHS High risk rare Physician led	1
Community Attached to GP practice All antenatal care in women's homes	1
Choice Support for women's choice Choice of home and hospital birth	2
TOTAL	**8**

BUMPS CONTROL (Benjamin)	
Element	**Score**
Partnership Conventional team midwifery care	1
Continuity Small team A & P continuity 20% have met birth midwife Much antenatal care provided by GPs	1
Autonomy Assume UK Standard	1
Community Hospital team midwifery linked to community midwife	1
Choice Assume UK standard for informed choice Choice of home and hospital birth	1
TOTAL	**5**

5 KYM PRACTICE (Flint)	
Element	**Score**
Partnership Relationship building aim of team	2
Continuity Care provided by a team of 4 midwives with backup and screening by obstetricians	1
Autonomy NHS employees Physician assessment of suitability for midwifery care	1
Community Hospital based Collaboration with other health care providers	1
Choice Informed decision making Hospital birth only option for RCT	1
TOTAL	**6**

KYM CONTROL (Flint)	
Element	**Score**
Partnership Assume UK standard	1
Continuity Assortment of different doctors and midwives at every stage of care	0
Autonomy NHS employees Physician assessment of suitability for midwifery care	1
Community Hospital based Collaboration with other health care providers	1
Choice Assume UK standard for informed choice Hospital birth only option for RCT	0
TOTAL	**3**

***A KYM Shared Care Control Group was also studied but not included here as model not defined and results similar to control group (Flint)**	
Element	**Score**
Partnership	
Continuity	
Autonomy	
Community	
Choice	
TOTAL	

6 Team Midwifery - Melbourne (Biro)	
Element	**Score**
Partnership Assume Australian standard	1
Continuity Continuity of midwifery care identifying characteristic of team Care provided by a group of seven midwives Some IP & PP care provided by hospital staff	1
Autonomy Assume NHS employees 3 required physician visits required Assume self regulating professionals	1
Community Community midwives providing majority of care Cooperate with other health professionals	2
Choice Assume Australian standard for informed choice All hospital births	0
TOTAL	**5**

Midwifery Control – Melbourne (Biro)	
Element	**Score**
Partnership Assume Australian standard	1
Continuity Variable levels of continuity Multiple unknown caregivers at birth and during postpartum	0
Autonomy Assume NHS employees 3 required physician visits Assume self regulating professionals	1
Community Community midwives providing majority of care Cooperate with other health professionals	2
Choice Assume Australian standard for informed choice Assume all hospital births	0
TOTAL	**4**

7 Caseload Midwifery North Staffs ((North Staffs Research Team)	
Element	**Score**
Partnership No change from traditional shared-care Assume UK standard	1
Continuity Care through antepartum, intrapartum and postpartum by named midwife and 1 or 2 partners. 95% women knew birth midwife	2
Autonomy Assume NHS employees. Assume self-regulated professionals	1
Community Community based midwives Cooperate with other health professionals	2
Choice Not addressed. All hospital births	0
TOTAL	**6**

Shared-Care Midwifery North Staffs ((North Staffs Research Team)	
Element	**Score**
Partnership Assume UK standard	1
Continuity Variable levels of continuity Multiple unknown caregivers at birth and during postpartum	0
Autonomy Assume NHS employees. Assume self-regulated professionals	1
Community Community based midwives Cooperate with other health professionals	2
Choice Not addressed. All hospital births	0
TOTAL	**4**

8 STOMP Midwifery (Homer)	
Element	**Score**
Partnership Partnership model endorsed by Australian midwives but no reference to relationships	1
Continuity Continuity of carer by team of 6 midwives to 300 women per year (50/MW) 24 hour call	1
Autonomy Assume NHS employees Assume self-regulating professionals	1
Community Clinics in Community Centres Good supportive infrastructure	2
Choice Assume Australian standard for informed choice All hospital births	0
TOTAL	**5**

STOMP Standard (Homer)	
Element	**Score**
Partnership Partnership model endorsed by Australian midwives but no reference to relationships	1
Continuity Hospital centred and fragmented	0
Autonomy Assume NHS employees Assume self-regulating professionals	1
Community Clinics in Hospitals	0
Choice Assume Australian standard for informed choice All hospital births	0
TOTAL	**2**

9 Partnership Caseload (Johnson)	
Element	**Score**
Partnership Partnership in name refers to team organization Assume local standard	1
Continuity All care provide by a partnership of two midwives except minimum 4 physician antenatal visits to a caseload of women Postpartum care by hospital staff	1
Autonomy Assume employees Bound by hospital protocols	1
Community Community based	2
Choice All births in hospital Aim to offer greater choice and control	1
TOTAL	**6**

Partnership Caseload Control (Johnson)	
Element	**Score**
Partnership Assume local standard	1
Continuity Fragmented care by multiple midwives	0
Autonomy Assume employees Bound by hospital protocols	1
Community Community based	2
Choice All births in hospital Assume Australian standard for informed choice	0
TOTAL	**4**

10 MDU TEAM (Turnbull)	
Element	**Score**
Partnership Assume Scottish standard	1
Continuity Named midwife and associate Caseload midwifery Team of 20 midwives Average # caregivers = 10	1
Autonomy Hospital Employees Assume self regulating professionals	1
Community Hospital based	0
Choice Assume Scottish standard All hospital births	0
TOTAL	**3**

MDU CONTROL (Turnbull)	
Element	**Score**
Partnership Assume Scottish standard	1
Continuity Assume Scottish standard Average # caregivers = 17	0
Autonomy Assume self regulating professionals Hospital employees	1
Community Hospital based	0
Choice All hospital births Assume Scottish standard	0
TOTAL	**2**

11 Birth Centre (Waldenstrom)	
Element	**Score**
Partnership Assume Swedish standard	1
Continuity Team midwifery (size of team unknown)	1
Autonomy Assume employees Obstetrician in charge of Birth Centre Assume self regulating professionals	1
Community In hospital birth centre based. No community attachment	0
Choice Assume Swedish standard Home birth offered but only 2 attended	0
TOTAL	**3**

Birth Centre Control (Waldenstrom)	
Element	**Score**
Partnership Assume Swedish Standard without continuity	0
Continuity Fragmented Team Midwifery	0
Autonomy Assume employees Births supervised by obstetricians	0
Community Site of clinics assumed in community Majority of care in hospital	1
Choice Assume Swedish standard Home birth offered number attended unknown	0
TOTAL	**1**

12 H from H Scheme (MacVicar)	
Element	**Score**
Partnership Assume Scottish standard	1
Continuity Some antenatal and all birth care given by 8 midwives and 2 sisters Shift schedule	1
Autonomy Hospital employee Assumed self regulating professionals	1
Community Hospital based	0
Choice Hospital based care	0
TOTAL	**3**

H from H Control (MacVicar)	
Element	**Score**
Partnership Assume Scottish standard	1
Continuity Standard fragmented care	0
Autonomy Assumed self regulating professionals Hospital employee	1
Community Antepartum care provided in community by multiple caregivers	1
Choice Hospital based care	0
TOTAL	**3**

13 Midwife Team (Rowley)	
Element	**Score**
Partnership Assume Australian standard	1
Continuity Team of 6 midwives provided AP, IP and early PP care to 360 women a year. Minimum of 3 scheduled physician visits.	1
Autonomy Assume Australian standard Assume self regulated employees	1
Community Assume hospital based	0
Choice All births in hospital Assume Australian standard for informed choice	0
TOTAL	**3**

Routine Care (Rowley)	
Element	**Score**
Partnership Assume Australian standard	1
Continuity Variety of physicians and midwives throughout.	0
Autonomy Assume Australian standard Assume self regulated employees	1
Community Hospital based	0
Choice All births in hospital Assume Australian standard for informed choice	0
TOTAL	**2**

14 TMP Team (Kenny)	
Element	**Score**
Partnership No additional orientation or education Assume Australian standard All midwifery care and practices were unchanged	1
Continuity A team of 8 midwives provided the majority of midwifery care through AP, IP and early PP to 240 women over 10 months. 3 routine physician visits	1
Autonomy Assume Australian standard Assume self regulated employees	1
Community Hospital based Consultation and collaboration with medical staff	0
Choice Individualized care a central focus of TMP All births in hospital	1
TOTAL	**4**

Conventional Care (Kenny)	
Element	**Score**
Partnership Assume Australian standard	1
Continuity All AP, IP and PP care provided by multiple midwives and physicians	0
Autonomy Assume Australian standard Assume self regulated employees	1
Community Hospital based	0
Choice All births in hospital Assume Australian standard for informed choice	0
TOTAL	**2**

15 Team Midwife Care (Waldenstrom)	
Element	**Score**
Partnership Assume Australian standard	1
Continuity A team of 8 midwives provided AP and IP care, in collaboration with medical staff, for a group of women Midwives rostered on L & B and cared for standard women when no team women birthing. Daily visits on PP ward; most care by hospital staff	1
Autonomy Assume Australian standard Assume self regulated employees	1
Community Hospital based	0
Choice All births in hospital Assume Australian standard for informed choice	0
TOTAL	**3**

Standard Care (Waldenstrom)	
Element	**Score**
Partnership Assume Australian standard	1
Continuity Multiple options with various care providers 10% of women who birthed in the hospital birth centre receive additional continuity	1
Autonomy Assume Australian standard Assume self regulated employees	1
Community Hospital based but some providers were community based	0
Choice All births in hospital some in hospital birth centre Assume Australian standard for informed choice	0
TOTAL	**3**

APPENDIX E

IMSEP RESEARCH QUESTIONS

Implementation of Midwifery Services Evaluation Project Research Questions

The IMSEP evaluation was designed to address the issues raised by the committee of stakeholders who commissioned the evaluation, each of whom brought a different perspective to the table Representatives on the committee who were government officials or executive officers of the participating health regions were particularly interested in knowing what the impact of integrating midwifery would be on the existing health service agencies and providers and what the overall economic implications would be. In addition, they were interested in the documentation of the historical role of their agencies in the development of the infrastructure to support the profession of midwifery. The representatives of medicine were also interested in the potential financial burden of introducing a new health care practitioner and as their association was officially opposed to home birth, due to safety concerns, they were very interested in clinical outcomes. Midwife representatives believed that midwives practising in Alberta would encounter some resistance to their integration and were interested in knowing how that resistance would be manifest and if strategies to break down barriers to their integration could be identified. Finally, all the committee members were interested in various aspects of what the experience of women receiving care from registered midwives would be and how satisfied they would be with the care they received.

To include the interests of all committee members in the evaluation proposal the following research questions were developed:

Question 1

What is the impact of integrating midwifery services on the workload of support systems within the four participating health regions?

Question 2

What are the barriers to integration of midwifery services into the health care systems of the four participating health regions?

Question 3

What strategies can be implemented to improve the integration of midwives into the health care systems of the four participating health care regions?

Question 4

What are the actual costs of maternity care provided by a midwife and what are the client characteristics that affect these costs?

Question 5

What happens to women who choose to receive care from Registered Midwives?

Five sub questions were developed to Question 5 to address specific aspects of what happens to women who choose midwifery care:

1. What is the impact of consultation between midwives and other health care professionals, transfer of care and transportation from preferred site of birth on the midwifery client?

2. Describe the client's transition from midwifery services to community health and medical services?

3. What are the clinical outcomes of women and babies who receive midwifery services?

4. What kind of data is needed to capture the essence of midwifery practice?

5. How satisfied are clients and health care providers with their experience of midwife attended birth?

Question 6

What is the Alberta experience of integration of midwifery services from regulation until the present, including the role of health regions?

APPENDIX F

ALBERTA PROVINCIAL ANTENATAL RISK ASSESSMENT

GUIDELINES, DEFINITIONS AND ASSESSMENT FORM

Guidelines Delivery Record

The delivery record revisions have been made to improve the record as both a clinical and data collection tool. Documentation on the record is a collaborative responsibility of the physician, midwife and nurse caring for the patient during labor and at delivery. The physician/midwife caring for the patient at the time of delivery is responsible to ensure accuracy of the documentation prior to signing the record. Comments on the revisions and/or recommendations for improvement can be directed to the Reproductive Care Office at 12230 106 Avenue, NW, EDMONTON, AB T5N 3Z1.

Part One

Antenatal Risk Assessment

Total the scores of part A, B, C, and D.
Low Risk 0 - 2, Moderate Risk 3 - 6 , High Risk > or = 7

The risk scores are cumulative and not exclusive of each other. For example, part A - Pre-Pregnancy, if the patient is diabetic with retinopathy, the patient would score a total of 7, ie: patient would score 1 point if she has diabetes, 3 points if she is on insulin, and an additional 3 points for the presence of retinopathy.

Part D is a new addition and is labelled under Other Risk Factors. These have been given arbitrary score values and have not been validated.

DEFINITIONS

Live Birth: The complete expulsion or extraction from the mother, irrespective of the duration of pregnancy, of a fetus in which, after expulsion or extraction there is breathing, beating of the heart, pulsation of the umbilical cord or unmistakable movement of voluntary muscle, whether or not the umbilical cord has been cut or the placenta attached. *Note: in Alberta all live births must be registered with the Vital Statistics Department, regardless of birth weight or gestation.*

Stillbirth: The complete expulsion or the extraction from the mother after at least 20 weeks pregnancy, or after attaining a weight of 500 grams or more, a fetus in which, after expulsion or extraction there is no breathing, beating of the heart, pulsation of the umbilical cord or unmistakable movement of voluntary muscle.

Gravida: Total number of pregnancies for this mother, including this pregnancy.

Term: Total number of babies born to this mother at > or = 37 weeks gestation, excluding this birth. *Note: if mother was a gravida 1 and had twins at 38 weeks, she would be G1T2.*

Preterm: Total number of babies born between 20 - < 37 weeks gestation to this mother, excluding this birth.

Abortions: Total number of pregnancy losses prior to 20 weeks gestation or less than 500 grams, including ectopic pregnancies.

Living: Total number of children currently living born to this mother, *excluding this birth.*

Neonatal Death: Death of an infant born to this mother that occurred within 28 days of birth regardless of cause.

Small for Gestational Age: infant's birth weight below the 10th percentile for gestational age.

Large for Gestational Age: Infant's birth weight above the 90th percentile for gestational age.

Major Congenital Anomaly: Includes any lethal anomaly, any anomaly that requires corrective surgery or any other anomaly that has a major effect on growth and development or quality of life.

Acute Medical Disorder: Refers to the presence of a significant medical condition that may affect the pregnancy or which may adversely be affected by the pregnancy. This may include a new medical disorder which appears during the pregnancy or it may be an acute attack or exacerbation of a pre-existing medical disorder.

Drug Dependent: Implies inappropriate or excessive use of any substance which may adversely affect the outcome of the pregnancy or the newborn.

Intrapartum Risk Assessment

The intrapartum risk assessment components are to be scored when the mother is admitted in labor and/or for induction of labor. These factors are known to be associated with potential risk to the fetus or the mother. *As these factors have not been validated an arbitrary risk score has been assigned.*

Delivery Record - Part One

MOTHER'S CHART

ANTENATAL RISK ASSESSMENT

Part A - Pre-Pregnancy (circle if applicable)

Score	
1	Age ≤ 17 at delivery
2	Age ≥ 35 at delivery
1	Weight ≥ 91 kg
1	Weight ≤ 45 kg
1	Height < 152 cm
	Diabetes
1	Controlled by diet only
3	Insulin used
3	Retinopathy documented
	Heart Disease
1	Asymtomatic (no affect on daily living)
3	Symtomatic (affects daily living)
	Hypertension
2	140/90 or greater
3	Antihypertensive Drugs
2	**Chronic Renal Disease Documented**
1	**OTHER medical disorders** eg. epilepsy, severe asthma, lupus, Crohn's disease

Part B - Past Obstetrical History (circle if applicable)

Score	
3	Neonatal death(s)
3	Stillbirth(s)
1	Abortion between 12 to 20 weeks and under 500 grams birth weight
1	Delivery at 20 - 37 weeks
2	Cesarean section
1	Small for dates
1	Large for dates
1	RH Isoimmunization - unaffected infant
3	RH Isoimmunization - affected infant
1	Major cong. anomaly eg. Downs, Heart, CNS defects

Part C - Problems in Current Pregnancy (circle if applicable)

Score	
2	Diagnosis of large for dates
3	Diagnosis of small for dates
2	Polyhydramnios or oligohydramnios
3	Multiple pregnancy
3	Malpresentation(s)
2	Membranes ruptured before 37 weeks
1	Bleeding < 20 weeks
3	Bleeding ≥ 20 weeks
2	Pregnancy induced hypertension
1	Proteinuria ≥ 1+
1	Gestational diabetes documented
3	Blood antibodies (Rh, Anti C, Anti K, etc.)
1	Anaemia (Hgb< 100 gm. per L)
1	Pregnancy ≥ 41 weeks
1	Poor weight gain (26 - 36 weeks< 0.5kg/week or weight loss)
1	Smoker - anytime during pregnancy

Part D - Other Risk Factors (Note: Scores to be validated) (circle if applicable)

Score	
3	Major fetal anomaly
3	Acute Medical Disorder (acute Asthma, Thyrotoxicosis,UTI, etc.)
	Substance Use:
3	Alcohol - ≥ 3 drinks on any one occasion during pregnancy
3	Alcohol - ≥ 1 drink per day throughout pregnancy
3	Drug dependent

Total Antepartum Risk Score

INTRAPARTUM RISK ASSESSMENT

Score	(circle if applicable)
2	≤ 34 weeks
1	35 - 36 weeks
1	Meconium in labour
1	Pregnancy induced hypertension
1	Anemia
1	Fever
1	Fetal heart rate abnormalities
1	Bleeding
1	Ruptured membranes > 24 hrs.
1	Seizures
1	Coagulopathy

Total Intrapartum Risk Score

Indications for Induction

(circle primary indication)

1. Significant A.P.H.
2. Suspect fetal compromise
3. Current intrauterine death
4. P.R.O.M.
5. Suspect I.U.G.R.
6. Pregnancy induced hypertension
7. Past history perinatal death
8. Diabetes
9. Gestational diabetes
10. Gestation ≥ 41 weeks
11. Suspect large for gestational age
12. Chronic essential hypertension
13. Social
14. Other, specify _____

Operative Delivery (c/s/, forceps, vacuum extraction)

(circle primary indication)

1. Elective repeat c/s
2. Elective primary c/s - breech or transverse lie
3. Arrest of progress in labor - first stage
4. Arrest of progress in labor - second stage
5. Failed trial of forceps
6. Fetal heart rate abnormalities
7. Intrapartum hemorrhage
8. Pyrexia in labor
9. Maternal hypertension
10. Maternal cardiac disease
11. Maternal endocrine disease (diabetes)
12. RH isoimmunization
13. Fetal malformation
14. Fetal illness (low platelets, etc.)
15. Multiple pregnancy
16. Prior hysterotomy
17. Placenta previa
18. Advanced maternal age
19. Maternal exhaustion
20. Other, specify _____

Date Signature

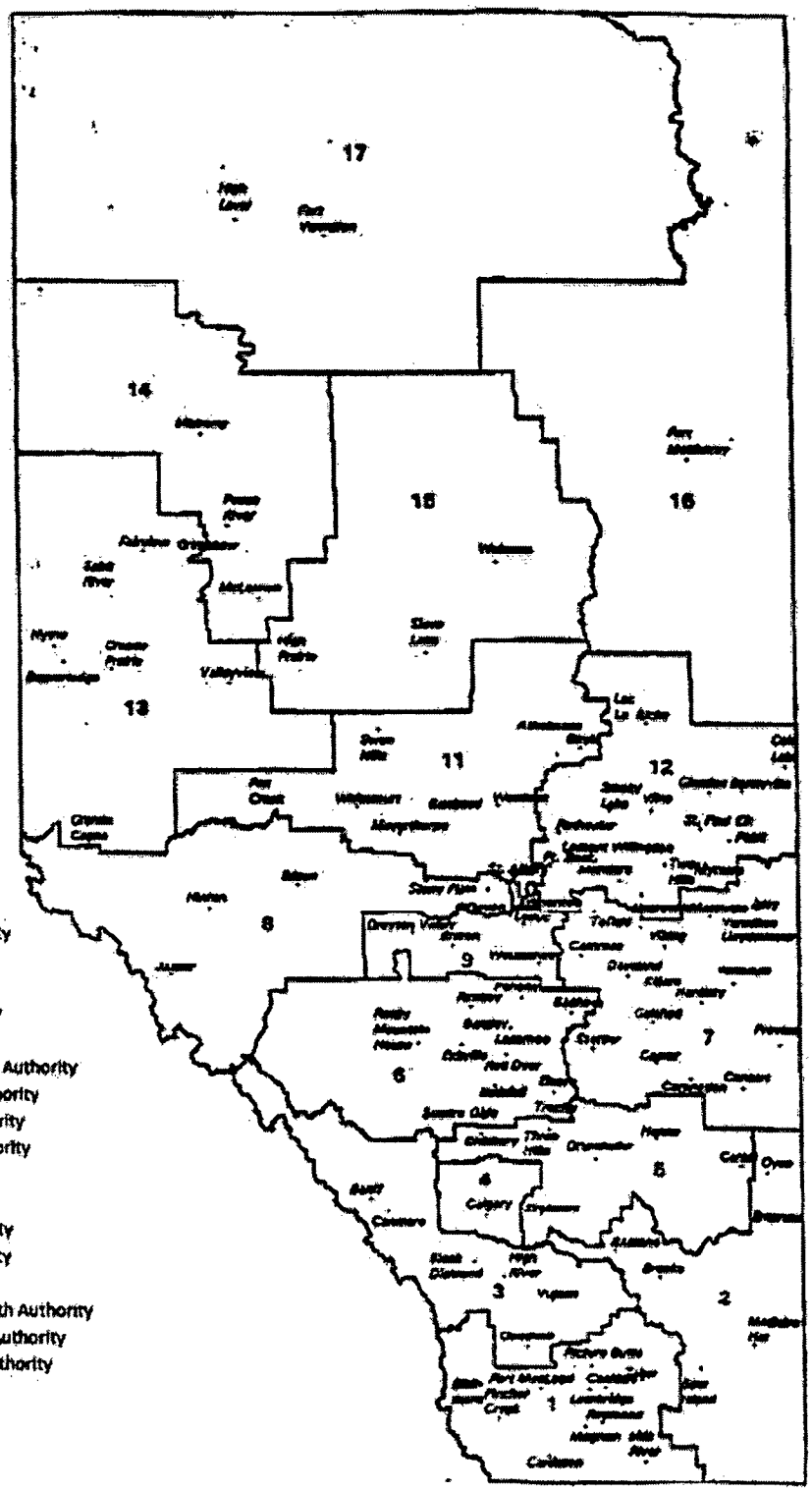
APPENDIX G

ALBERTA HEALTH REGIONS

ALBERTA

Health Regions

April 1996



1. Chinook Regional Health Authority
2. Palliser Health Authority
3. Headwaters Health Authority
4. Calgary Regional health Authority
5. Health Authority #5
6. David Thompson Regional Health Authority
7. East Central Regional Health Authority
8. WestView Regional Health Authority
9. Crossroads Regional Health Authority
10. Capital Health Authority
11. Aspen Regional Health Authority
12. Lakeland Regional Health Authority
13. Mistahia Regional Health Authority
14. Peach Regional health Authority
15. Keeweetinok Lakes Regional Health Authority
16. Northern Lights Regional Health Authority
17. Northwestern Regional Health Authority

APPENDIX H

Information Letters and Consent Forms

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

INFORMATION LETTER FOR MIDWIFERY CLIENTS

Project Title: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators:

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Northern Alberta Midwifery Implementation Coordinator
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Purpose:

You are being asked to take part in the Integration of Midwifery Services Evaluation Project (IMSEP). The purpose is to evaluate the impact of midwifery becoming part of the Alberta health care system. Your midwife has access to what she needs to care for you if you choose a home, birth centre, or hospital birth. That is, she can use hospitals and emergency transport. She can also use laboratory, pharmacy and diagnostic imaging services.

The IMSEP is being conducted by the Alberta Association of Midwives and five regional health authorities (RHAs). The RHAs are 'test sites' for the project. They are the Calgary, Capital, David Thompson, Headwaters, and Westview RHAs.

Procedure:

If you have been pregnant for 20 weeks or less, you can ask to take part in this study. If you are in the study, you will be given three forms to fill out after your baby is born. Each form will take 5 to 10 minutes to finish. We will give you stamped envelopes so that you can mail each completed form to us.

The first form is called the **Labour Agentry Scale.** It is to be filled out approximately 1 week after your baby is born. The second and third forms are the **Client Experience and Satisfaction** form and the **Edinburgh Post Partum Depression Scale.** They are to be filled out approximately 4 weeks after your baby is born. At approximately 6 months after your baby is born you will be contacted by telephone, by the project director, and asked a few questions about feeding your baby.

We will also ask for information about you and your baby. Your midwife will be able to give us most of this information. We may need more if you see a physician or are transferred to a hospital. We will need your permission to get this information from your records at Alberta Health or your RHA. Your signature on the consent form will allow us to do this.

Benefits and Risks:

In Alberta, women have to pay for midwifery services. You will not have to pay for basic midwifery services if you take part in the study.

You may offer to talk about your maternity care in a focus group. This will give you a chance to share your opinion with midwives and other health care givers. You will be given a separate information letter and consent form if you choose to do this.

There are no known risks for you if you decide to take part in this study.

Confidentiality:

You will be given a code number if you agree to take part in this study. Your name and anything else that could say who you are will be removed from all forms.

The consent form and the code book will be kept in a locked cupboard separate from other forms that could identify you. The other forms will also be kept in a locked cabinet. We will keep them for at least seven years. Only the researchers will be able to see these forms.

Three of the researchers will have access to the consent forms and code book. These researchers will be organizing the paper work for the study. They are Beverley O'Brien, Sheila Harvey, and Susan Beischel.

Freedom to Withdraw:

You do not have to take part in this study unless you want to. You may stop at any time just by telling your midwife. The care that you get from your midwife will not change. You will need to pay for any further midwifery services if you choose to leave the study.

Right to refuse to answer a question:

You do not have to answer any question that you do not want to answer.

Secondary Analysis:

Data collected in this study may be used in future studies. If this happens, all information about you will remain confidential. The ethics committee will need to approve the future study.

If you have any questions about this study, you may contact Beverley O'Brien at (780) 492-8232 or Sheila Harvey (403) 286-2176. If you have any concerns about any aspect of this study, you may contact the Patient Concerns Office at the Capital Health Authority (780) 407-1040. This office has no affiliation with the investigators.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

CONSENT FOR MIDWIFERY CLIENTS IN THE INTEGRATION OF MIDWIFERY SERVICES EVALUATION PROJECT (IMSEP)

Title of Study: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators: Beverley O'Brien, RM, DNSc, Associate Professor, Faculty of Nursing; Member, Perinatal Research Centre, University of Alberta, (780) 492-8232
Sheila Harvey, RM, MN, Southern Alberta Midwifery Implementation Consultant; (403) 286-2176

Co-Investigators: Susan Beischel, MN, Northern Alberta Midiwifery Implementation Co-ordinator (780) 491-5566
Damon Mayes, MS, Biostatistician, Perinatal Research Centre, (780) 491-5424
Philip Jacobs, PhD, Health Economist, Public Health Sciences, (780) 492-6293

Do you understand that you have been asked to be in a research study?
[ ] Yes [ ] No
Have you read and received a copy of the attached Information Sheet?
[ ] Yes [ ] No
Do you understand the benefits and risks involved in taking part in this research study?
[ ] Yes [ ] No
Have you had an opportunity to ask questions and discuss this study?
[ ] Yes [ ] No
Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason and it will not affect your care.
[ ] Yes [ ] No
Has the issue of confidentiality been explained to you? Do you understand who will have access to your records?
[ ] Yes [ ] No
Do you understand that Alberta Health or your regional health authority may be contacted for information about you or your newborn?
[ ] Yes [ ] No
May we contact you to ask you to take part in a focus group?
[ ] Yes [ ] No

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

This study was explained to me by: _____

I agree to take part in this study.

_____	_____	_____
Signature of Research Participant	Date	Printed Name
_____	_____	_____
Witness	Date	Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____	_____
Signature of Investigator or Designee	Date

The information sheet must be attached to this consent form and a copy given to the research subject.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

CONSENT FOR MIDWIFERY CLIENTS

Project Title: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators:

Beverley O'Brien, DNSc
Associate Professor, Faculty of Nursing
Member, Perinatal Research Centre
(780) 492-8232

Sheila Harvey, MN
Southern Alberta Midwifery Implementation Consultant
(403) 286-2176

Co-Investigators:

Damon Mayes, MS
Biostatistician, Perinatal Research Centre
(780) 491-5424

Philip Jacobs, PhD
Professor, Public Health Sciences
(780) 492-6293

Susan Beischel, MN
Northern Alberta Midwifery Implementation Coordinator
(780) 491-5566

Sponsor: Funded by Alberta Health and Wellness (Project funds administered by the University of Alberta)

Purpose:

You are being asked to take part in a research project to evaluate the impact of midwifery becoming part of the Alberta health care system. Your midwife has access to what she needs to care for you if you choose a home, birth centre, or hospital birth. That is, she can admit you to the hospital and use emergency transport. She can also use laboratory, pharmacy and diagnostic imaging services.

The research is being conducted by the Alberta Association of Midwives and five regional health authorities (RHAs). The RHAs are 'test sites' for the project. They are the Calgary, Capital, David Thompson, Headwaters, and Westview RHAs.

Description of Procedure:

If you have been pregnant for 20 weeks or less, you can ask to take part in this study. If you are in the study, you will be given three forms to fill out after your baby is born. Each form will take 5 to 10 minutes to finish. We will give you stamped envelopes so that you can mail each completed form to us.

The first form is called the **Labour Agentry Scale.** It is to be filled out approximately 1 week after your baby is born. The second and third forms are the **Client Experience and Satisfaction** form and the **Edinburgh Post Partum Depression Scale.** They are to be filled out approximately 4 weeks after your baby is born. At approximately 6 months after your baby is born you will be contacted by telephone, by the project director, and asked a few questions about feeding your baby.

We will also ask for information about you and your baby. Your midwife will be able to give us most of this information. We may need more if you see a physician or are transferred to a hospital. We will need your permission to get this information from your records at Alberta Health or your RHA. Your signature on the consent form will allow us to do this.

Direct and Indirect Benefits:

In Alberta, women have to pay for midwifery services. You will not have to pay for basic midwifery services if you take part in the study.

You may offer to talk about your maternity care in a focus group. This will give you a chance to share your opinion with midwives and other health care givers. You will be given a separate information letter and consent form if you choose to do this.

There are no known risks for you if you decide to take part in this study.

Alternatives to Enrollment in the Research:

You do not have to take part in this study unless you want to. You may stop at any time just by telling your midwife. The care that you get from your midwife will not change. You will need to pay for any further midwifery services if you choose to leave the study. If you choose to be in the study you do not have to answer any question that you do not want to answer.

Explanation of who will have access to information Collected and Identity of Participant:

You will be given a code number if you agree to take part in this study. Your name and any thing else that could say who you are will be removed from all forms.

The consent form and the code book will be kept in a locked cupboard separate from other forms that could identify you. The other forms will also be kept in a locked cabinet. We will keep them for at least seven years. Only the researchers will be able to see these forms.

Three of the researchers will have access to the consent forms and code book. These researchers will be organizing the paper work for the study. They are Beverley O'Brien, Sheila Harvey, and Susan Beischel.

Secondary Analysis:

Data collected in this study may be used in future studies. If this happens, all information about you will remain confidential. The ethics committee will need to approve the future study.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

Costs to Participants:

There will be no financial costs that you will incur as a condition of or because of participation in the research study.

Compensation:

In the event that you suffer injury as a result of participating in this research no compensation will be provided for you by the Alberta Health research grant, the University of Alberta, the Calgary Regional Health Authority, or the investigators. You still have all your legal rights. Nothing said here about treatment or compensation in any way alters your right to recover damages.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. If you have further questions concerning matters related to this research please contact either Beverley O'Brien at 1-877-543-7765 or Sheila Harvey at (403) 286-2176. If you have any questions concerning your rights as a possible participant in this research, please contact the Office of Medical Bioethics, Faculty of Medicine, University of Calgary, at 220-7990.

_____ _____
Participant's Signature Date

_____ _____
Investigator and/or Delegates Signature Date

_____ _____
Witness' Signature Date

A copy of this consent form has been given to you to keep for your records and reference.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

CONSENT AND AUTHORIZATION

to Minister of Health and Wellness and Department of Health and Wellness of Alberta for Release of Health Information for Research Purposes

I, _____, (the "Study Participant") of

_____ (insert complete address)
have signed below as Study Participant, agree to the terms and provisions in this document, and hereby authorize the **Minister of Health and Wellness (the "Minister"), the Department of Health and Wellness of Alberta (the "Department"), Alberta Blue Cross, and the participating regional health authorities (the "RHAs")**

- **Capital Health Authority**
- **Calgary Regional Health Authority**
- **David Thomson Regional Health Authority**
- **Headwaters Regional Health Authority**
- **Westview Regional Health Authority) acting through their Chief Executive Officers (the "CEOs")**, to release, disclose and provide the following information (the "information") regarding the Study Participant:

> "The benefits paid on behalf of myself and/or my newborn, from September 1, 2000 to June 31, 2003, for basic health services provided by physicians, chiropractors, optometrists and podiatrists."

to each or any of the following persons: **Beverley O'Brien, Sheila Harvey** (the "Researchers"); and the Study Participant agrees that the information may be used by the Researchers for the research study, which evaluates the impact of the integration of midwifery services in Alberta.

This consent is provided on the understanding that the Minister will obtain the Researchers' undertaking that they:

- will not release the information to any person (other than those in the Researchers' research team) without further written authorization from the Study Participant; and
- will keep the information located in a physically secure environment so that no other persons will have access to the information.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

The Study Participant certifies that the following information is correct in respect of the Study Participant:
Personal Health Number: _____
Birth Date: _____

This Consent and Authorization will be in effect to authorize the Minister, the Department and the five participating RHAs to, through their authorized officials, disclose the information from the date this Consent and Authorization is signed to and including September 1, 2000 to June 31, 2003.

The Study Participant releases and discharges the Minister, the participating RHAs, and their CEOs, employees and agents, from any actions or claims which the Study Participant may have or allege or which may otherwise arise as a result of the release of the information to the Researchers. The Study Participant further agrees that

the Minister and his or her employees and agents; and
the RHAs and their CEOs, employees and agents;

shall have no obligation or liability to the Study Participant regarding any use, disclosure or handling of the information by the Researchers.

I, the Study Participant, have been made aware of the reasons why the health information is needed and the risks and benefits to me of consenting or refusing to consent to the disclosure. I also understand that my consent

to the disclosure by the Department; or
to the disclosure by an RHA;

can be revoked by me at any time by written notice to the Department; or the RHA concerned.

I hereby give my consent and authorization as provided herein.

Signed this _____ day of _____, _____

_____	_____
Signature of Study Participant (or Guardian if Study Participant is less than 18 years old. If Guardian signs, indicate status: _____)	Witness to signature of the Study Participant (or Guardian)
Print Name: _____	Print Witness Name: _____

Participant's Initial _____ Researcher's Initial _____

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

Consent and Authorization to the Minister of Health and Wellness and the Department of Health and Wellness of Alberta for Release of Health Information for Research Purposes

1. I, _____, (the "Study Participant")

of _____ *(insert complete address)* have signed below as Study Participant, agree to the terms and provisions in this document, and hereby authorize the **Minister of Health and Wellness (the "Minister"), the Department of Health and Wellness of Alberta (the "Department"), Alberta Blue Cross, and the participating regional health authorities** [being those designated below by "√" or other mark and hereinafter called the "RHAs" or "participating RHA"]

_____ **Capital Health Authority**

_____ **Calgary Regional Health Authority**

_____ **David Thomson Regional Health Authority**

_____ **Headwaters Regional Health Authority**

_____ **Westview Regional Health Authority**

acting through their respective Chief Executive Officer (the "CEO"), to release, disclose and provide the following information (the "information"):

> "information as to and regarding the benefits Alberta Health and Wellness and or the Regional Health Authorities paid on behalf of myself and/or my new-born, from September 1,2000 to June 2003 for basic health services; hospital services; emergency health services; home care services; public/rehabilitation services; laboratory services; Alberta Blue Cross Benefits; and other health services".

to each or any of the following persons: **Beverley O'Brien, Sheila Harvey** (the "Researchers").

2. I agree that the information may be used by the Researchers for the research study, which evaluates the impact of the integration of midwifery services in Alberta.

3. This consent is provided on the understanding that:
   (a) the Minister will, with regard to any information provided by the Minister; and
   (b) each participating RHA will, with regard to any information provided by that RHA;
   obtain the Researchers' undertaking that the Researchers:

(i) will not release the information in individually identifiable form to any person (other than those in the Researchers' research team) without further written authorization from me; and
(ii) will keep the information located in a physically secure environment so that no other persons will have access to the information;

provided however, that information in the form of study results that does not disclose individually identifiable information or that is only in statistical form, may be released by the Researchers if it does not refer to me or my newborn by name or permit our identification.

4. (a) I certify that the following information is correct about my health care number and date of birth:

Personal Health Number: _____

Birth Date: _____

and I authorize the Minister and the RHAs to collect from the Researchers the above information in this form.

(b) I agree to provide my baby's PHN and birth date to the Researchers and authorize:
(i) the Researchers to provide my baby's PHN and birth date to the Minister and the RHAs; and
(ii) the Minister and the RHAs to collect my baby's PHN and birth date from the Researcher.

5. This Consent and Authorization is in effect to allow disclosure to be made for health services utilized by me and or by my newborn during the period from September 1, 2000 to and including June 30, 2003.

6. I release and discharge the Minister of Health and Wellness, Alberta Blue Cross, the participating RHAs, and their CEOs, employees and agents, from any actions or claims which I may have or allege or which may otherwise arise as a result of the release of the information to the Researchers.

7. I further agree that while the Minister and participating RHAs are to obtain the Researchers' confidentiality agreement as referred to above,

(a) the Minister and his or her employees and agents;
(b) the RHAs and their CEOs, employees and agents; and
(c) Alberta Blue Cross and its employees and agents.

shall have no obligation or liability to me regarding any use, disclosure or handling of the information by the Researchers.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

8. I, the Study Participant, have been made aware of the reasons why the health information is needed and the risks and benefits, if any, to me as a result of my consenting or refusing to consent to the disclosure. I also understand that my consent:
   (a) to the Minister or the Department can be revoked by me at any time by written notice to the Department;
   (b) to an RHA may be revoked by me at any time by written notice to the RHA concerned; and
   (c) to Alberta Blue Cross may be revoked by me at any time by written notice to Alberta Blue Cross.

9. I hereby give my consent and authorization as provided herein.

Signed this _____ day of _____, 20___

_____	_____
Signature of Study Participant (or Guardian if Study Participant is less than 18 years old. If Guardian signs, indicate status: _____)	Witness to signature of the Study Participant (or Guardian)
Print Name:_____	Print Name of Witness: _____

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

INFORMATION LETTER FOR FOCUS GROUP PARTICIPANTS

Project Title: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators:

Beverley O'Brien, DNSc
Associate Professor, Faculty of Nursing
Member, Perinatal Research Centre
(780) 492-8232

Sheila Harvey, MN
Southern Alberta Midwifery Implementation
Consultant
(403) 286-2176

Co-Investigators:

Damon Mayes, MS
Biostatistician, Perinatal Research Centre
(780) 491-5424

Philip Jacobs, PhD
Professor, Public Health Sciences
(780) 492-6293

Susan Beischel, MN
Northern Alberta Midwifery Implementation Coordinator
(780) 491-5566

Purpose:

You offered or were asked to be in a group to talk about the impact of integrating midwives into the health care system. This is called a focus group. Focus groups are one method of collecting data for the Integration of Midwifery Services Evaluation Project (IMSEP). You will be in one of 12 focus groups that are planned for the IMSEP.

The IMSEP was developed by a partnership between the Alberta Association of Midwives and five regional health authorities. The regional health authorities (i.e., Calgary, Capital, David Thompson, Headwaters, and Westview) will be 'test sites' for the IMSEP. Midwives who take part in the IMSEP will have access to resources needed to provide maternity services to clients choosing home, birth centre, or hospital births. These resources include hospital admitting privileges or service agreements; emergency transport; and laboratory, pharmacy and diagnostic imaging services.

Procedure:

The composition of each focus group will be different. The groups will be made up of midwifery clients, midwives, and health professionals who have some experience with regulated midwifery services. Your group may have just midwifery clients, just health professionals or it may be a mixed group. Group members will be asked to discuss broad questions about the impact of having registered midwives in the health care system. They will be asked to identify issues related to integrating midwifery services. They will also be asked for suggestions about what might improve the integration process.

All that is said in the focus group will be tape recorded and transcribed word for word. This will be done so that what was said can be examined by the researchers.

Benefits and Risks:

By taking part in a focus group, you will have an opportunity to share what you think about the process of integrating midwives into the health care system. You will also be able to make suggestions so that the process is easier for all midwifery clients and health providers. Your suggestions will be shared with members of the five regional health authorities.

Being in a focus group will take about two hours, not counting travel time. If you are a midwifery client, you will be given child care if you need it. If you are an employee of a regional health authority and were asked to attend the group, you will be given 'time owing' if the group meets when you are not scheduled to work. If you are a physician and were asked to attend the group, you will be given an honorarium to compensate for time lost from your practice.

All focus group members will be provided with light refreshments and parking costs. There are no known risks to taking part in a focus group.

Confidentiality:

You will be given a code number when you take part in a focus group. Your name and all identifying information will be removed by the typist when she/he transcribes the group discussion. The book with code numbers and the consent forms will be kept in a locked cupboard separate from other IMSEP data. Three of the researchers will have access to the code book. These researchers are the ones that will be responsible for organizing the study. They are Beverley O'Brien, Sheila Harvey, and Susan Beischel. All IMSEP data will be kept in a different locked cabinet that is accessible only by the research team. The data will be kept for at least 7 years after the study is completed.

Any information that you give will be held in confidence by the researchers. All focus group members will be asked to hold what other group members say in confidence.

All information will be held in confidence except when professional codes of ethics and or legislation require reporting.

Freedom to Withdraw:

You do not have to take part in a focus group unless you want to and you may withdraw at any time just by telling the group leader. The care that a midwifery client gets from her midwife or any other health care provider will not be affected if she decides that she does not want to take part in the focus group.

Right to refuse to answer a question:

You are not expected to answer any question that you do not want to answer.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

Secondary Analysis:

Data collected in this study may be used in future studies. If this happens, all information that could identify you will remain confidential. The ethics committee will need to approve any future studies.

If you have any questions about this study, you may contact Beverley O'Brien at (780) 492-8232 or Sheila Harvey (403) 286-2176. If you have any concerns about any aspect of this study, you may contact the Patient Concerns Office at the Capital Health Authority. The number is (780) 407-1040. This office has no affiliation with the investigators.

CONSENT FOR FOCUS GROUP MEMBERS IN THE INTEGRATION OF MIDWIFERY SERVICES EVALUATION PROJECT (IMSEP)

Title of Study: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators: Beverley O'Brien, RM, DNSc, Associate Professor, Faculty of Nursing; Member, Perinatal Research Centre, University of Alberta, (780) 492-8232
Sheila Harvey, RM, MN, Southern Alberta Midwifery Implementation Consultant, (403) 286-2176

Co-Investigators: Susan Beischel, MN, Northern Alberta Midiwifery Implementation Co-ordinator, (780) 491-5566
Damon Mayes, MS, Biostatistician, Perinatal Research Centre, (780) 491-5424
Philip Jacobs, PhD, Health Economist, Public Health Sciences, (780) 492-6293

Do you understand that you have been asked to be in a research study?
[ ] Yes [ ] No
Have you read and received a copy of the attached Information Sheet?
[ ] Yes [ ] No
Do you understand the benefits and risks involved in taking part in this research study?
[ ] Yes [ ] No
Have you had an opportunity to ask questions and discuss this study?
[ ] Yes [ ] No

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason. Withdrawing will not affect your care if you are a midwifery client.

[ ] Yes [ ] No

Has the issue of confidentiality been explained to you? Do you understand who will have access to your records?

[ ] Yes [ ] No

This study was explained to me by: _____

I agree to take part in this study.

_____	_____	_____
Signature of Research Participant	Date	Printed Name
_____	_____	_____
Witness	Date	Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____	_____
Signature of Investigator or Designee	Date

The information sheet must be attached to this consent form and a copy given to the research subject.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

INTEGRATION OF MIDWIFERY SERVICES EVALUATION PROJECT

Discussion groups

Thank you for choosing midwifery care and for agreeing to participate in the integration of midwifery services evaluation project.

We would like to invite you to participate in a small discussion group with other women who have received care from a midwife. The group will be lead by a facilitator who would like to hear how women feel about the care they received from midwives and what it is like to have a midwife attended birth.

Participating in the group would take about three hours of your time and parking, childcare and light refreshments will be available.

If you would like to participate in a group meeting please contact the project director at:
1-877- 643-7765 (mid proj)

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

CONSENT FOR FOCUS GROUPS

Project Title: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators:

Beverley O'Brien, DNSc
Associate Professor, Faculty of Nursing
Member, Perinatal Research Centre
(780) 492-8232

Sheila Harvey, MN
Southern Alberta Midwifery Implementation Consultant
(403) 286-2176

Co-Investigators:

Damon Mayes, MS
Biostatistician, Perinatal Research Centre
(780) 491-5424

Philip Jacobs, PhD
Professor, Public Health Sciences
(780) 492-6293

Susan Beischel, MN
Northern Alberta Midwifery Implementation Coordinator
(780) 491-5566

Sponsor: Funded by Alberta Health and Wellness (Project funds administered by the University of Alberta)

Purpose:

You are being asked to take part in a research study to evaluate the impact of midwifery becoming part of Alberta maternal and newborn health care services.

The research study was developed by a partnership between the Alberta Association of Midwives and five regional health authorities. The regional health authorities (i.e., Calgary, Capital, David Thompson, Headwaters, and Westview will be 'test sites' for the research study). Midwives who take part in the study will have access to resources needed to provide maternity services to clients choosing home, birth centre, or hospital births. These resources include hospital admitting privileges or service agreements; emergency transport; and laboratory, pharmacy and diagnostic imaging services.

Description of Procedures:

You offered or were asked to be in a group to talk about the impact of integrating midwives into the health care system. This is called a focus group. Focus groups are one method of collecting data for a study called the Evaluation of the Integration of Midwifery Services in Alberta. You will be in one of 12 focus groups that are planned for the study.

The composition of each focus group will be different. The groups will be made up of midwifery clients, midwives, and health professionals who have some experience with regulated midwifery services.

Your group may have just midwifery clients, just health professionals or it may be a mixed group. Group members will be asked to discuss broad questions about the impact of having registered midwives in the health care system. They will be asked to identify issues related to integrating midwifery services. They will also be asked for suggestions about what might improve the integration process.

All that is said in the focus group will be tape recorded and transcribed word for word. This will be done so that what was said can be examined by the researchers.

Direct and Indirect Benefits:

By taking part in a focus group, you will have an opportunity to share what you think about the process of integrating midwives into the health care system. You will also be able to make suggestions so that the process is easier for all midwifery clients and health providers. Your suggestions will be shared with members of the five regional health authorities.

Being in a focus group will take about two hours, not counting travel time. If you are a midwifery client, you will be given child care if you need it. If you are an employee of a regional health authority and were asked to attend the group, you will be given 'time owing' if the group meets when you are not scheduled to work. If you are a physician and were asked to attend the group, you will be given an honorarium to compensate for time lost from your practice.

All focus group members will be provided with light refreshments and parking costs. There are no known risks to taking part in a focus group.

Alternatives to Enrollment in the Research:

You do not have to take part in a focus group unless you want to and you may withdraw at any time just by telling the group leader. The care that a midwifery client gets from her midwife or any other health care provider will not be affected if she decides that she does not want to take part in the focus group. If you choose to be in the study you do not have to answer any question that you do not want to answer.

Explanation of who will have access to information Collected and Identity of Participant:

You will be given a code number when you take part in a focus group. Your name and all identifying information will be removed by the typist when she/he transcribes the group discussion. The book with code numbers and the consent forms will be kept in a locked cupboard separate from other study data. Three of the researchers will have access to the code book. These researchers are the ones that will be responsible for organizing the study. They are Beverley O'Brien, Sheila Harvey, and Susan Beischel. All study data will be kept in a different locked cabinet that is accessible only by the research team. The data will be kept for at least 7 years after the study is completed.

Any information that you give will be held in confidence by the researchers. All focus group members will be asked to hold what other group members say in confidence.

All information will be held in confidence except when professional codes of ethics and or legislation require reporting.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

Secondary Analysis:

Data collected in this study may be used in future studies. If this happens, all information that could identify you will remain confidential. The ethics committee will need to approve any future studies.

Costs to Participants:

There will be no financial costs that you will incur as a condition of or because of participation in the research study.

Compensation:

In the event that you suffer injury as a result of participating in this research no compensation will be provided for you by the Alberta Health research grant, the University of Alberta, the Calgary Regional Health Authority, or the investigators. You still have all your legal rights. Nothing said here about treatment or compensation in any way alters your right to recover damages.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. If you have further questions concerning matters related to this research please contact either Beverley O'Brien at 1-877-543-7765 or Sheila Harvey at (403) 286-2176. If you have any questions concerning your rights as a possible participant in this research, please contact the Office of Medical Bioethics, Faculty of Medicine, University of Calgary, at 220-7990.

_____ _____
Participant's Signature Date

_____ _____
Investigator and/or Delegates Signature Date

_____ _____
Witness' Signature Date

A copy of this consent form has been given to you to keep for your records and reference.

Participant's Initial _____ Researcher's Initial _____ Page 3 of 3

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

INFORMATION LETTER FOR MIDWIVES

Project Title: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators:

Beverley O'Brien, DNSc
Associate Professor, Faculty of Nursing
Member, Perinatal Research Centre
(780) 492-8232

Sheila Harvey, MN
Southern Alberta Midwifery Implementation Consultant
(403) 286-2176

Co-Investigators:

Damon Mayes, MS
Biostatistician, Perinatal Research Centre
(780) 491-5424

Philip Jacobs, PhD
Professor, Public Health Sciences
(780) 492-6293

Susan Beischel, MN
Northern Alberta Midwifery Implementation Coordinator
(780) 491-5566

Purpose:

We are asking you to take part in the Integration of Midwifery Services Evaluation Project (IMSEP). The IMSEP is proposed by the Alberta Association of Midwives and five regional health authorities so that the impact of integrating midwifery services into Alberta maternal and newborn health care services can be evaluated. Five regional health authorities will be 'test sites' for the project. They are the Calgary, Capital, David Thompson, Headwaters, and Westview health authorities. Fifty midwifery clients from Capital Health Authority, 50 from Calgary Regional Health Authority and 50 from David Thompson, Westview, and Headwaters Regional Health Authorities combined will be enrolled in the IMSEP. All midwives will be allotted about the same number of 'spaces' so that they can accommodate clients who wish to enrol in the project.

Procedure:

You will be given access to resources needed to provide maternity services to clients choosing home, birth centre, or hospital births. These resources include hospital privileges or service agreements; emergency transport; and laboratory, pharmacy and diagnostic imaging services.

We will ask you to give the phone number of the IMSEP to all clients wanting to enrol. Those who meet criteria for inclusion will be enrolled sequentially until 'spaces' in the IMSEP allocated for each midwife and each region are full. You will be notified when your client is enrolled. If all of the spaces allocated to you are full, your client will be informed of this and referred back to you. If a client withdraws,

for any reason, before 36 completed weeks gestation, we will enrol another client if there are sufficient funds.

If you take part in the IMSEP, you will be asked to complete up to four survey forms for each client. It is expected that this will take about two hours for each client. You will be asked to document care provided at varying times during the antenatal, intrapartum and post partum periods on two of the survey forms. In addition, you will be asked to record indications for consultation and/or transfer of care on a third form. You will only be asked to complete the fourth form if your client is transported to hospital.

Benefits and Risks:

You will be able to access the resources that you need to provide primary care in all settings to women enrolled in the IMSEP. Your will be paid $45.00 an hour up to a maximum of 44 hours for each of your clients enrolled in the IMSEP.

Four focus groups will be conducted in your area over a 16-month period. You will be expected to participate in at least one of the focus groups. We will provide separate information letters and consent forms for these groups.

Confidentiality:

You will be given a code number if you agree to take part in this study. Your name and any other information that could identify you are will be removed from all survey and focus group data. All IMSEP data will be kept for at least 7 years and will be kept in a locked cabinet. Consent forms and the code book will be kept in a locked cupboard separate from other IMSEP data. All information will be held confidential except when professional codes of ethics and or legislation require reporting.

Three of the investigators will have access to the consent forms and code book. These investigators are the ones that will be responsible for organizing the study. They are Beverley O'Brien, Sheila Harvey, and Susan Beischel.

Freedom to Withdraw:

You do not have to take part in IMSEP unless you want to. You may withdraw at any time just by telling one of the investigators. You will be compensated for the care that you provided for your client prior to the time that either you or she withdrew.

Right to refuse to answer a question:

You do not have to answer any question that you do not want to answer.

Secondary Analysis:

Data collected in this study may be used in future studies. If this happens, all information about you will remain confidential. The ethics committee will need to approve the future study.

If you have any questions about this study, you may contact Beverley O'Brien at (780) 492-8232 or Sheila Harvey (403) 286-2176. If you have any concerns about any aspect of this study, you may

contact the Patient Concerns Office at the Capital Health Authority. The number is (780) 407-1040. This office has no affiliation with the investigators.

CONSENT FOR MIDWIVES PARTICIPATING IN THE INTEGRATION OF MIDWIFERY SERVICES EVALUATION PROJECT (IMSEP)

Title of Study: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators: Beverley O'Brien, RM, DNSc, Associate Professor, Faculty of Nursing; Member, Perinatal Research Centre, University of Alberta, (780) 492-8232
Sheila Harvey, RM, MN, Southern Alberta Midwifery Implementation Consultant; (403) 286-2176

Co-Investigators: Susan Beischel, MN, Northern Alberta Midiwifery Implementation Co-ordinator (780) 491-5566
Damon Mayes, MS, Biostatistician, Perinatal Research Centre, (780) 491-5424
Philip Jacobs, PhD, Health Economist, Public Health Sciences, (780) 492-6293

Do you understand that you have been asked to be in a research study?
[ ] Yes [ ] No
Have you read and received a copy of the attached Information Sheet?
[ ] Yes [ ] No
Do you understand the benefits and risks involved in taking part in this research study?
[ ] Yes [ ] No
Have you had an opportunity to ask questions and discuss this study?
[ ] Yes [ ] No
Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason.
[ ] Yes [ ] No
Has the issue of confidentiality been explained to you? Do you understand who will have access to your records?
[ ] Yes [ ] No
Do you understand that you will be asked to take part in a focus group?
[ ] Yes [ ] No

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

This study was explained to me by: _____

I agree to take part in this study.

_____	_____	_____
Signature of Research Participant	Date	Printed Name
_____	_____	_____
Witness	Date	Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____	_____
Signature of Investigator or Designee	Date

The information sheet must be attached to this consent form and a copy given to the research subject.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

DATA COLLECTION INSTRUCTIONS

Dear Midwife,

For each client enrolled in the Integration of Midwifery Services Evaluation Project you will receive a package containing a set of forms and questionnaires. They are colour coded for easy identification. Each of your clients who agree to participate in the Integration of Midwifery Services Evaluation Project is to be assigned a package of forms at her initial visit. Please follow these instructions to use the forms and questionnaires to collect the information needed to complete the evaluation.

1. At the First Visit:

Distribute the package as follows:

WHITE (Summary of Instructions and Informed Consents)
The midwife attaches the Summary of Instructions to the client's record. The client and a witness sign the consent forms. The midwife telephones the Project Director at 1-877-643-7767 to arrange for the consent forms to be collected.

PINK (Integration of Midwifery Services Evaluation Project Discussion Group, Labour Agentry, Client Experience and Satisfaction and Edinburgh Postpartum Depression Scale)
The Integration of Midwifery Services Evaluation Project Discussion Groups form is an invitation to the client to participate in a discussion group and is given to her by the midwife. The client is given the other three questionnaires and the attached stamped addressed envelopes by the midwife. The client is asked to complete and mail the Labour Agentry questionnaire as soon as possible after the birth of her baby and to complete and mail the other two questionnaires as soon as possible after her final visit to her midwife.

BLUE (Summary of Provincial Records and General Care and Consultation and/or Transfer of Care)
These forms are attached to the client's record, reviewed by the midwife at each encounter with the client and completed by the midwife, as the information becomes available.

ORANGE (Summary of Provincial Intrapartum Record and Birth Care)
This form is attached to the client record and completed by the midwife after the birth.

GREEN (Transport - Midwife)
This form is attached to the client's record and completed by the midwife if the client or her baby is transported to the hospital.

YELLOW (Transport - Hospital Staff)
This questionnaire, the attached information letter and stamped, addressed envelope are attached to the client's record. If transportation of the client or her baby occurs, the midwife gives the form to the nurse or physician receiving the client or baby in hospital.

2. Within 48 Hours of Birth

The midwife completes the Summary of Provincial Intrapartum Record and Birth Care as soon after the client gives birth as it is convenient. The midwife telephones the project director at 1-877- 843-7765 within 48 hours to inform her that the birth has occurred. The midwife continues to complete the forms and questionnaires on the client's record at each encounter with her and/or her baby.

3. At the Final Postpartum Visit

Review all the forms and questionnaires remaining on the client's record and ensure that they are completed as fully as possible.

Fill in the check boxes in the **documentation** section at the bottom of the **Summary of Instructions.** Remove the remaining forms and questionnaires from the client's record and return them to the package. Put the package in a safe place until the project director collects it.

If you have problems or questions please contact the project director at 1-877-643-7765.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

CONSENT FOR MIDWIVES

Project Title: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators:

Beverley O'Brien, DNSc
Associate Professor, Faculty of Nursing
Member, Perinatal Research Centre
(780) 492-8232

Sheila Harvey, MN
Southern Alberta Midwifery Implementation
Consultant
(403) 286-2176

Co-Investigators:

Damon Mayes, MS
Biostatistician, Perinatal Research Centre
(780) 491-5424

Philip Jacobs, PhD
Professor, Public Health Sciences
(780) 492-6293

Susan Beischel, MN
Northern Alberta Midwifery Implementation Coordinator
(780) 491-5566

Sponsor: Funded by Alberta Health and Wellness (Project funds administered by the University of Alberta)

Purpose:

We are asking you to take part in the research study to evaluate the integration of midwifery into the Alberta maternal and newborn health care services. The research study was proposed by the Alberta Association of Midwives and five regional health authorities. Five regional health authorities will be 'test sites' for the project. They are the Calgary, Capital, David Thompson, Headwaters, and Westview health authorities. Fifty midwifery clients from Capital Health Authority, 50 from Calgary Regional Health Authority and 50 from David Thompson, Westview, and Headwaters Regional Health Authorities combined will be enrolled in the research study. All midwives will be allotted about the same number of 'spaces' so that they can accommodate clients who wish to enrol in the project.

Description of Procedures:

You will be given access to resources needed to provide maternity services to clients choosing home, birth centre, or hospital births. These resources include hospital privileges or service agreements; emergency transport; and laboratory, pharmacy and diagnostic imaging services.

We will ask you to give the phone number of the research study (877-643-7765) to all clients wanting to enroll. Those who meet criteria for inclusion will be enrolled sequentially until 'spaces' in the research study allocated for each midwife and each region are full. You will be notified when your client is enrolled. If all of the spaces allocated to you are full, your client will be informed of this and referred back to you. If a client withdraws, for any reason, before 36 completed weeks gestation, we will enroll another client if there are sufficient funds.

If you take part in the research study, you will be asked to complete up to four survey forms for each client. It is expected that this will take about two hours for each client. You will be asked to document care provided at varying times during the antenatal, intrapartum and post partum periods on two of the survey forms. In addition, you will be asked to record indications for consultation and/or transfer of care on a third form. You will only be asked to complete the fourth form if your client is transported to hospital.

Direct and Indirect Benefits:

You will be able to access the resources that you need to provide primary care in all settings to women enrolled in the research study. Your will be paid $45.00 an hour up to a maximum of 44 hours for each of your clients enrolled in the study.

Four focus groups will be conducted in your area over a 16-month period. You will be expected to participate in at least one of the focus groups. We will provide separate consent forms for these groups.

Alternatives to Enrollment in the Research:

You do not have to take part in this study unless you want to. You may withdraw at any time just by telling one of the investigators. You will be compensated for the care that you provided for your client prior to the time that either you or she withdrew. You do not have to answer any question that you do not want to answer.

Explanation of who will have access to information Collected and Identity of Participant:

You will be given a code number when you take part in the study. The book with code numbers and the consent forms will be kept in a locked cupboard separate from other study data. Three of the researchers will have access to the code book. These researchers are the ones that will be responsible for organizing the study. They are Beverley O'Brien, Sheila Harvey, and Susan Beischel. All data will be kept in a different locked cabinet that is accessible only by the research team. The data will be kept for at least 7 years after the study is completed.

All information will be held in confidence except when professional codes of ethics and or legislation require reporting.

Secondary Analysis:

Data collected in this study may be used in future studies. If this happens, all information about you will remain confidential. The ethics committee will need to approve the future study.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

Costs to Participants:

There will be no financial costs that you will incur as a condition of or because of participation in the research study.

Compensation:

In the event that you suffer injury as a result of participating in this research no compensation will be provided for you by the Alberta Health research grant, the University of Alberta, the Calgary Regional Health Authority, or the investigators. You still have all your legal rights. Nothing said here about treatment or compensation in any way alters your right to recover damages.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. If you have further questions concerning matters related to this research please contact either Beverley O'Brien at 1-877-543-7765 or Sheila Harvey at (403) 286-2176. If you have any questions concerning your rights as a possible participant in this research, please contact the Office of Medical Bioethics, Faculty of Medicine, University of Calgary, at 220-7990.

_____ _____
Participant's Signature Date

_____ _____
Investigator and/or Delegates Signature Date

_____ _____
Witness' Signature Date

A copy of this consent form has been given to you to keep for your records and reference.

Participant's Initial _____ Researcher's Initial _____ Page 3 of 3

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

INFORMATION LETTER FOR INTERVIEW PARTICIPANTS

Project Title: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators:

Beverley O'Brien, DNSc
Associate Professor, Faculty of Nursing
Member, Perinatal Research Centre
(780) 492-8232

Sheila Harvey, MN
Southern Alberta Midwifery Implementation Consultant
(403) 286-2176

Co-Investigators:

Damon Mayes, MS
Biostatistician, Perinatal Research Centre
(780) 491-5424

Philip Jacobs, PhD
Professor, Public Health Sciences
(780) 492-6293

Susan Beischel, MN
Northern Alberta Midwifery Implementation Coordinator
(780) 491-5566

Purpose:

You are being asked take part in an interview because you are the manager of a hospital unit where midwives have privileges or services agreements. Interviewing is one method of collecting data for the Integration of Midwifery Services Evaluation Project (IMSEP).

The IMSEP was proposed by the Alberta Association of Midwives and five regional health authorities. The purpose is to evaluate the impact of integrating midwifery services into Alberta maternal and newborn health care services. Five regional health authorities are 'test sites' for the project. They are the Calgary, Capital, David Thompson, Headwaters, and Westview health authorities. Midwives taking part in the IMSEP have access to resources needed to provide maternity services to clients choosing home, birth centre, or hospital births. These resources include hospital privileges or service agreements; emergency transport; and laboratory, pharmacy and diagnostic imaging services.

Procedure:

You will be asked to discuss broad questions about the impact of having registered midwives on your unit. You will be asked to identify issues related to integrating midwifery services within your unit. You will also be asked to suggest ways to facilitate the integration process.

Your interview will be tape recorded and transcribed word for word. This will be done so that your interview can be reviewed and analysed by the investigators.

Benefits and Risks:

You will have input into how midwives are integrated into hospital units. Recommendations from unit managers will be shared with representatives from Alberta Health and the five regional health authorities.

Because you are an employee of a regional health authority, the interview will take place during your working hours or you will be given 'time owing' if the interview takes place at a time when you are not at work.

There are no known risks to taking part in an interview.

Confidentiality:

You will be given a code number when you take part in an interview. Your name and all identifying information will be removed by the typist when she/he transcribes the interview. Only unit managers in hospitals where midwives have privileges will be interviewed. Because this will be a small number (i.e., 5 or 6), it may be possible for those who read our reports at participating regional health authorities or Alberta Health to identify you.

Any information that could identify you will be held in confidence by the researchers. All interview data will be kept in a locked cabinet separate from any identifying information. All data will be kept for at least 7 years. Your name will not be used in any reports or publications of the findings from this study. All information will be held confidential except when professional codes of ethics and or legislation require reporting.

Freedom to Withdraw:

You were identified as the person best able to describe the impact of integrating midwifery services in your unit. However, you do not have to take part in this interview if you do not want to.

Right to refuse to answer a question:

You are not expected to answer any question that you do not want to answer.

Secondary Analysis:

Data collected in this study may be used in future studies. If this happens, all information about you will remain confidential. The ethics committee will need to approve any future studies.

If you have any questions about this study, you may contact Beverley O'Brien at (780) 492-8232 or Sheila Harvey (403) 286-2176. If you have any concerns about any aspect of this study, you may contact the Patient Concerns Office at the Capital Health Authority. The number is (780) 407-1040. This office has no affiliation with the investigators.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

CONSENT FOR INTERVIEW (UNIT MANAGERS WHO INTERACT WITH MIDWIVES AND THEIR CLIENTS)

Title of Study: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators: Beverley O'Brien, RM, DNSc, Associate Professor, Faculty of Nursing; Member, Perinatal Research Centre, University of Alberta, (780) 492-8232
Sheila Harvey, RM, MN, Southern Alberta Midwifery Implementation Consultant; (403) 286-2176

Co-Investigators: Susan Beischel, MN, Northern Alberta Midiwifery Implementation Co-ordinator (780) 491-5566
Damon Mayes, MS, Biostatistician, Perinatal Research Centre, (780) 491-5424
Philip Jacobs, PhD, Health Economist, Public Health Sciences, (780) 492-6293

Do you understand that you have been asked to be in a research study?
[ ] Yes [ ] No
Have you read and received a copy of the attached Information Sheet?
[ ] Yes [ ] No
Do you understand the benefits and risks involved in taking part in this research study?
[ ] Yes [ ] No
Have you had an opportunity to ask questions and discuss this study?
[ ] Yes [ ] No
Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason.
[ ] Yes [ ] No
Has the issue of confidentiality been explained to you? Do you understand who will have access to your records?
[ ] Yes [ ] No
May we contact you to ask you to take part in a focus group?
[ ] Yes [ ] No

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

This study was explained to me by: _____

I agree to take part in this study.

_____	_____	_____
Signature of Research Participant	Date	Printed Name
_____	_____	_____
Witness	Date	Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____	_____
Signature of Investigator or Designee	Date

The information sheet must be attached to this consent form and a copy given to the research subject.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

CONSENT FOR INTERVIEWS

Project Title: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators:
Beverley O'Brien, DNSc
Associate Professor, Faculty of Nursing
Member, Perinatal Research Centre
(780) 492-8232

Sheila Harvey, MN
Southern Alberta Midwifery Implementation Consultant
(403) 286-2176

Co-Investigators:
Damon Mayes, MS
Biostatistician, Perinatal Research Centre
(780) 491-5424

Philip Jacobs, PhD
Professor, Public Health Sciences
(780) 492-6293

Susan Beischel, MN
Northern Alberta Midwifery Implementation Coordinator
(780) 491-5566

Sponsor: Funded by Alberta Health and Wellness (Project funds administered by the University of Alberta)

Purpose:

You are being asked take part in an interview because you are the manager of a hospital unit where midwives have privileges or services agreements. Interviewing is one method of collecting data for a research study to evaluate the integration of midwifery services in Alberta.

The research study was proposed by the Alberta Association of Midwives and five regional health authorities. The purpose is to evaluate the impact of integrating midwifery services into Alberta maternal and newborn health care services. Five regional health authorities are 'test sites' for the project. They are the Calgary, Capital, David Thompson, Headwaters, and Westview health authorities. Midwives taking part in the research study have access to resources needed to provide maternity services to clients choosing home, birth centre, or hospital births. These resources include hospital privileges or service agreements; emergency transport; and laboratory, pharmacy and diagnostic imaging services.

Description of Procedures:

You will be asked to discuss broad questions about the impact of having registered midwives on your unit. You will be asked to identify issues related to integrating midwifery services within your unit. You will also be asked to suggest ways to facilitate the integration process.

Your interview will be tape recorded and transcribed word for word. This will be done so that your interview can be reviewed and analysed by the investigators.

Direct and Indirect Benefits:

You will have input into how midwives are integrated into hospital units. Recommendations from unit managers will be shared with representatives from Alberta Health and the five regional health authorities.

Because you are an employee of a regional health authority, the interview will take place during your working hours or you will be given 'time owing' if the interview takes place at a time when you are not at work.

There are no known risks to taking part in an interview.

Alternatives to Enrollment in the Research:

You were identified as the person best able to describe the impact of integrating midwifery services in your unit. However, you do not have to take part in this interview if you do not want to. You are not expected to answer any question that you do not want to answer.

Explanation of who will have access to information Collected and Identity of Participant:

You will be given a code number when you take part in an interview. Your name and all identifying information will be removed by the typist when she/he transcribes the interview. Only unit managers in hospitals where midwives have privileges will be interviewed. Because this will be a small number (i.e., 5 or 6), it may be possible for those who read our reports at participating regional health authorities or Alberta Health to identify you.

Any information that could identify you will be held in confidence by the researchers. All interview data will be kept in a locked cabinet separate from any identifying information. All data will be kept for at least 7 years. Your name will not be used in any reports or publications of the findings from this study. All information will be held confidential except when professional codes of ethics and or legislation require reporting.

Secondary Analysis:

Data collected in this study may be used in future studies. If this happens, all information about you will remain confidential. The ethics committee will need to approve any future studies.

Costs to Participants:

There will be no financial costs that you will incur as a condition of or because of participation in the research study.

Compensation:

In the event that you suffer injury as a result of participating in this research no compensation will be provided for you by the Alberta Health research grant, the University of Alberta, the Calgary Regional Health Authority, or the investigators. You still have all your legal rights. Nothing said here about treatment or compensation in any way alters your right to recover damages.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. If you have further questions concerning matters related to this research please contact either Beverley O'Brien at 1-877-543-7765 or Sheila Harvey at (403) 286-2176. If you have any questions concerning your rights as a possible participant in this research, please contact the Office of Medical Bioethics, Faculty of Medicine, University of Calgary, at 220-7990.

_____ _____
Participant's Signature Date

_____ _____
Investigator and/or Delegates Signature Date

_____ _____
Witness' Signature Date

A copy of this consent form has been given to you to keep for your records and reference.

IMSEP
INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number _____

INFORMATION LETTER FOR HEALTH CARE WORKERS PARTICIPATING IN THE TRANSPORT OF A MIDWIFERY CLIENT

Project Title: Evaluation of the Integration of Midwifery Services in Alberta

Principal Investigators:

Beverley O'Brien, DNSc
Associate Professor, Faculty of Nursing
Member, Perinatal Research Centre
(780) 492-8232

Sheila Harvey, MN
Southern Alberta Midwifery Implementation
Consultant
(403) 286-2176

Co-Investigators:

Damon Mayes, MS
Biostatistician, Perinatal Research Centre
(780) 491-5424

Philip Jacobs, PhD
Professor, Public Health Sciences
(780) 492-6293

Susan Beischel, MN
Northern Alberta Midwifery Implementation Coordinator
(780) 491-5566

Purpose:

You are being asked to complete a survey. This is because you were involved in the care of a midwifery client who was transported to the hospital. The client was in the Integration of Midwifery Services Evaluation Project (IMSEP).

The IMSEP is being conducted by the Alberta Association of Midwives and five regional health authorities (RHAs). The five RHAs are Calgary, Capital, David Thompson, Headwaters, and Westview and these RHAs will be 'test sites' for the project. The purpose is to evaluate the impact of integrating midwifery into Alberta maternal and newborn health care services. Midwives taking part in the IMSEP have access to resources needed to provide maternity services to clients choosing home, birth centre, or hospital births. These resources include hospital privileges or service agreements; emergency transport; and laboratory, pharmacy and diagnostic imaging services.

Procedure:

The midwife or one of the IMSEP investigators will give you a survey form along with this letter. Please complete the survey and mail it to us in the attached stamped envelope. By completing the survey, you have indicated your willingness to do so. The survey should take about 10 minutes to complete.

Benefits and Risks:

By completing this survey, you will have an opportunity to suggest ways to facilitate the transfer process for midwifery clients and health providers. What you suggest in the survey will be shared with representatives from Alberta Health and the five RHAs.

Because you are an employee of an RHA, you will be given time to complete the survey during regular working hours.

There are no known risks to doing this survey.

Confidentiality:

You will be given a code number if you agree to complete the survey. Your name will be given to one of the researchers and recorded in a code book. The code book and any other information that could identify you will be kept in a locked cupboard separate from the survey data. Survey data will be kept for at least seven years. All survey data will be stored in a locked cabinet. All information will be held confidential except when professional codes of ethics or legislation require reporting.

Three of the researchers will have access to the code book. This is because they are responsible for organizing the study. They are Beverley O'Brien, Sheila Harvey, and Susan Beischel.

Freedom to Withdraw:

You were identified as a person who has experience with receiving a midwifery client who was transported to the hospital. You do not have to complete this survey if you don't want to.

Right to refuse to answer a question:

You do not have to answer any question that you do not want to answer.

Secondary Analysis:

Data collected in this study may be used in future studies. If this happens, all information about you will remain confidential. The ethics committee will need to approve any future studies.

If you have any questions about this study, you may contact Beverley O'Brien at (780) 492-8232 or Sheila Harvey (403) 286-2176. If you have any concerns about any aspect of this study, you may contact the Patient Concerns Office at the Capital Health Authority. The number is (780) 407-1040. This office has no affiliation with the investigators.

APPENDIX I

Results of Audit

Results of Audit

(a) Some of the participants (n=5) reported being asked to pay an additional $500.00 or to purchase a book from the midwives for $500.00, an amount that the midwife felt was fair compensation over and above what IMSEP was providing as payment. This situation was confined to a geographic area, and was addressed by the investigators. Midwives were reminded of the terms of IMSEP participation, including the provision that no additional costs for basic services were to be incurred by participants. The midwives received $1,995.00 per course of care for each midwifery participant. Midwives in one of the regions had increased their fees to $2,500.00 by the time he the study commenced. Therefore, there was a discrepancy between fees charged for clients who were and those who were not study participants. The midwives cooperated by returning all extra funds to participants who had personally paid for some portion of their basic midwifery care.

(b) Some participants (n=16) were seeing other health care providers such as an apprentice or associate within the midwife's practice for some appointments. This was not a widespread practice and was addressed by the investigators with the midwives concerned.

(c) All participants ultimately received the information that was provided by IMSEP investigators and completed all consent forms. It was necessary for participants to sign consent forms as per the ethical guidelines of the university o their health region, their health region and Alberta Health and Wellness. Any forms not forwarded to the research office were tracked and obtained. All participants were willing to sign written consent forms after being provided with written and verbal information about the study.

(d) Rapport was established between the research office and the participants, thus facilitating the opportunity to have any concerns that arose throughout the research project voiced. The participants were encouraged to contact the research office at any time that questions or concerns arose.

(e) The issue of high insurance costs for midwives, a current concern at the time, was raised by several participants during the audit. This was usually accompanied by the fear that midwives would be unable to pay high premiums, thus threatening the availability of midwifery services in Alberta. Participants frequently and emphatically expressed their desire to have the Alberta health system fund midwifery services. Many also expressed praise for the midwifery model as a childbirth option.

APPENDIX J

Questionnaires

CLIENT QUESTIONNAIRES

IMSEP

INTEGRATION OF
MIDWIFERY SERVICES
EVALUATION PROJECT

Client Identification Number	_____

To Participants in the Integration of Midwifery Services Evaluation Project:
Please complete this questionnaire and mail it to the Project Director in the envelope provided **as soon after your birth as you feel comfortable and before six weeks postpartum.** If you have any questions about the questionnaire, please call the Project Director at 1-877-643-7765. Please do not put your name on the questionnaire - all answers are anonymous and will not be seen by your caregivers. Thank you for taking the time to help us to evaluate this program.

Part 1: Labour Agentry Scale

The Labour Agentry Scale is a standardized Canadian scale used to measure the degree of control/satisfaction that women have during their childbirth experience. Please take a few moments to circle the number for each item which best describes how you felt during your labour and birth.

1.	I felt competent	Almost Always 1 2 3 4 5 6 7 Rarely
2.	I was dealing with labour	Almost Always 1 2 3 4 5 6 7 Rarely
3.	Everything made sense	Almost Always 1 2 3 4 5 6 7 Rarely
4.	I felt very responsible	Almost Always 1 2 3 4 5 6 7 Rarely
5.	I felt incomplete and like I was going to pieces	Almost Always 1 2 3 4 5 6 7 Rarely
6.	I felt secure	Almost Always 1 2 3 4 5 6 7 Rarely
7.	I felt incapable	Almost Always 1 2 3 4 5 6 7 Rarely
8.	I experienced a sense of great anxiety	Almost Always 1 2 3 4 5 6 7 Rarely

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9.	I felt adequate	Almost Always 1 2 3 4 5 6 7 Rarely
10.	I felt open and receptive	Almost Always 1 2 3 4 5 6 7 Rarely
11.	I felt good about my behaviour during labour	Almost Always 1 2 3 4 5 6 7 Rarely
12.	I felt powerless	Almost Always 1 2 3 4 5 6 7 Rarely
13.	I experienced a sense of being with others who care	Almost Always 1 2 3 4 5 6 7 Rarely
14.	I didn't know what to expect from one moment to the next	Almost Always 1 2 3 4 5 6 7 Rarely
15.	I experienced complete awareness of everything that was happening	Almost Always 1 2 3 4 5 6 7 Rarely
16.	Everything seemed unclear and unreal	Almost Always 1 2 3 4 5 6 7 Rarely
17.	I felt relaxed	Almost Always 1 2 3 4 5 6 7 Rarely
18.	I experienced a sense of conflict	Almost Always 1 2 3 4 5 6 7 Rarely
19.	I felt fearful	Almost Always 1 2 3 4 5 6 7 Rarely
20.	I had a sense of not being	Almost Always 1 2 3 4 5 6 7 Rarely
21.	I felt important	Almost Always 1 2 3 4 5 6 7 Rarely

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22.	Everything seemed wrong	Almost Always 1 2 3 4 5 6 7 Rarely
23.	I felt victorious	Almost Always 1 2 3 4 5 6 7 Rarely
24.	I experienced a sense of active striving	Almost Always 1 2 3 4 5 6 7 Rarely
25.	I had a feeling of constriction and of being confined	Almost Always 1 2 3 4 5 6 7 Rarely
26.	I felt awkward	Almost Always 1 2 3 4 5 6 7 Rarely
27.	Someone or something else was in charge of my labour	Almost Always 1 2 3 4 5 6 7 Rarely
28.	I experienced a sense of success	Almost Always 1 2 3 4 5 6 7 Rarely
29.	I had a sense of perspective on what was happening	Almost Always 1 2 3 4 5 6 7 Rarely

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To Participants in the Integration of Midwifery Services Evaluation Project:
Please complete this questionnaire and mail it to the Project Director in the envelope **provided as soon as possible after your final visit with your midwife.** If you have any questions about the questionnaire, please call the Project Director at 1-877-643-7765. Please do not put your name on the questionnaire - all answers are anonymous and will not be seen by your caregivers. Thank you for taking the time to help us to evaluate this program.

Part 2: Client Experience and Satisfaction

Please answer the following questions by placing an X in the appropriate box.

1. By 36 weeks of pregnancy, did you plan your birth to take place
   [ ] at home [ ] hospital [ ] birth centre?

2. At the onset of labour were you
   [ ] at home [ ] hospital [ ] birth centre?

3. Did your birth take place
   [ ] at home [ ] hospital [ ] birth centre?

4. Were you cared for during your pregnancy by a
   [ ] midwife [ ] physician?

5. Were you cared for during your labour and delivery by a
   [ ] midwife [ ] physician?

6. Were you cared for during the postpartum period by a
   [ ] midwife [ ] physician?

Please circle the number that corresponds with your feelings.

7. (a) During your pregnancy did you have adequate time to ask questions or discuss your concerns with your caregivers?

Never				Always
1	2	3	4	5

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7. (b) During your postpartum period did you have adequate time to ask questions or discuss your concerns with your caregivers?

Never 1 2 3 4 5 Always

8. Was adequate explanation given as to how to reach your caregiver in the event of an emergency?

Never 1 2 3 4 5 Always

9. (a) During your pregnancy, early labour or postpartum period, did you try to reach your caregiver outside office hours?

[ ] Yes [ ] No

(b) If yes, were you able to reach your caregiver in a timely manner?

Never 1 2 3 4 5 Always

10. Overall, how satisfied were you with your childbirth experience?

Not satisfied 1 2 3 4 5 Very Satisfied

Please use this space for any additional comments you would like to make about your pregnancy care, including those aspects you liked or those areas in which you would like to see improvement.

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To Participants in the Integration of Midwifery Services Evaluation Project:
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Part 3: Edinburgh Postnatal Depression Scale

As you have recently had a baby, we would like to know how you are feeling. Please **put an x in the box** beside the answer which comes closest to how you have felt **in the past 7 days,** not just how you feel today.

Here is an example, already completed.

I have felt happy:
[ ] Yes, all the time
[x] Yes, most of the time
[ ] No, not very often
[ ] No, not at all

This would mean: "I have felt happy most of the time" during the past week.
Please complete the other questions in the same way.

In the Past 7 Days:

1. **I have been able to laugh and see the funny side of things**
   [ ] As much as I always could
   [ ] Not quite so much now
   [ ] Definitely not so much now
   [ ] Not at all

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2. I have looked forward with enjoyment to things
[ ] As much as I ever did
[ ] Rather less than I used to
[ ] Definitely less than I used to
[ ] Hardly at all

3. I have blamed myself unnecessarily when things went wrong
[ ] Yes, most of the time
[ ] Yes, some of the time
[ ] Not very often
[ ] No, never

4. I have been anxious or worried for no good reason
[ ] No, not at all
[ ] Hardly ever
[ ] Yes, sometimes
[ ] Yes, very often

5. I have felt scared or panicky for no good reason
[ ] Yes, quite a lot
[ ] Yes, sometimes
[ ] No, not much
[ ] No, not at all

6. Things have been getting on top of me
[ ] Yes, most of the time I haven't been able to cope at all
[ ] Yes, sometimes I haven't been coping as well as usual
[ ] No, most of the time I have coped quite well
[ ] No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping
[ ] Yes, most of the time
[ ] Yes, sometimes
[ ] Not very often
[ ] No, not at all

8. I have felt sad or miserable
[ ] Yes, most of the time
[ ] Yes, quite often
[ ] Not very often
[ ] No, not at all

9. I have been so unhappy that I have been crying
[ ] Yes, most of the time
[ ] Yes, quite often
[ ] Only occasionally
[ ] No, never

10. The thought of harming myself has occurred to me
[ ] Yes, quite often
[ ] Sometimes
[ ] Hardly ever
[ ] Never

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BREASTFEEDING QUESTIONNAIRE

This questionnaire is to be administered by telephone at 6 months postpartum by the project director.

Ask mother if she ever breastfed her baby. Indicate "Yes" or "No" below.
If no, omit questions 1 through 6 and go straight to question number 7
[ ] Yes
[ ] No (Please give reason for not breastfeeding _____
_____

1. **Below is a list of problems some women have had with breastfeeding. Read the list to the mother and indicate all problems she states she has had:**
   [ ] Sleepy baby
   [ ] Sore nipples
   [ ] Swollen (engorged) breasts
   [ ] Baby had trouble latching on
   [ ] Painful breasts
   [ ] Not enough milk
   [ ] Flat or inverted nipples
   [ ] Family member(s) who don't like it that I am breastfeeding
   [ ] Other Please describe: _____
   [ ] I have had no problems breastfeeding

2. **Are you still breastfeeding?**
   [ ] Yes **(Go to question 3)**
   [ ] No **(Go to question 5)**

3. **Do you have breastfeeding problems now?**
   [ ] Yes
   [ ] No
   Please describe: _____

4. **Besides breastmilk, is your baby being fed with anything else?**
   [ ] Yes - bottles of water only
   [ ] Yes - bottles of formula only
   [ ] Yes - bottles of formula and water
   [ ] Yes – other, please describe: _____
   [ ] No

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If mother is still breastfeeding omit questions 5 and 6 and go straight to question 7

5. **When did you stop breastfeeding?**
   - [ ] During the first week after my baby was born.
   - [ ] During the second week after my baby was born.
   - [ ] Between 2-4 weeks after my baby was born.
   - [ ] Between 4-6 weeks after my baby was born.
   - [ ] 2 months after my baby was born.
   - [ ] 3 months after my baby was born.
   - [ ] 4 months after my baby was born.
   - [ ] 5 months after my baby was born.
   - [ ] 6 months after my baby was born.

6. **Why did you stop breastfeeding? (Indicate all that apply).**
   - [ ] I was having problems with it
   - [ ] I was too tired
   - [ ] I did not enjoy it
   - [ ] Family members were not supportive
   - [ ] I was advised to stop breastfeeding. By whom? _____
   - [ ] Any other reason (please explain):_____

_____

_____

_____

For Mothers or Babies who were transported by Emergency Medical Services (EMS)

7. **During your childbirth experience you were or your baby was transported by EMS from** _____ to _____

   (a) How much was the total cost of the transportation? _____

   (b) How much of the total cost did you have to pay from your own pocket? _____

   (c) Who paid the rest of the cost? _____

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For mothers who were prescribed medication(s) by their midwife

8. (a) How much was the total cost of the medication(s)?

Drug Name	Cost
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

(b) How much of the total cost did you have to pay from your own pocket?

Drug Name	Cost
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

(c) Who paid the rest of the cost? _____

MIDWIFE QUESTIONNAIRES

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SUMMARY OF PROVINCIAL RECORDS AND GENERAL CARE

General Care

1. **Mother's Permanent Residence:** _____ (Name of Town or City)

2. **Maternal Birth Date:** _____ (Year) _____ (Month) _____ (Day)

3. **Maternal Race/Ethnicity:**
   [ ] Caucasian [ ] Black [ ] Asian [ ] Aboriginal [ ] Other _____

4. **Highest Level of Maternal Education:**
   [ ] Grade School [ ] High School [ ] College or Technical School
   [ ] University Degree [ ] Post-graduate Degree

5. **Annual Family Income:**
   [ ] Less than $10,999 [ ] $20,000 - $29,999 [ ] $30,000 - $39,999
   [ ] $40,000 - $49,999 [ ] $50,000 - $59,999 [ ] $60,000 or more

6. **Marital Status at End of Prenatal Period:**
   [ ] Married [ ] Divorced [ ] Living with Partner in a Committed Relationship
   [ ] Separated [ ] Single [ ] Widowed

7. **Extended Health Care Coverage:**
   [ ] Aboriginal Services [ ] Blue Cross [ ] Great West Life
   [ ] Social Services [ ] Alberta School Employees Benefit Program
   [ ] Sun Life [ ] Other Specify_____

8. **Date of First Prenatal Visit:** _____ (Year) _____ (Month) _____ (Day)

9. [ ] Gravida [ ] Para [ ] Term [ ] Preterm [ ] Stillbirth
   [ ] Abortions:
   [ ] Elective [ ] Spontaneous [ ] Ectopic

10. **Initial Visit Risk Score** _____

11. **Gestational age of client at first prenatal visit:** _____ completed weeks

12. **Estimate Date of Delivery:** _____ (Year) _____ (Month) _____ (Day)
    (best estimate, e.g. LNMP or ultrasound)

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SUMMARY OF PROVINCIAL RECORDS

Antepartum

1. **Tests/Procedures ordered by Midwife during the Antepartum**
(check all that apply; if more than once, indicate number)

[ ] Pregnancy Test (urine)
[ ] Pregnancy Test (blood)
[ ] Ultrasound Screening
[ ] Ultrasound Diagnostic
[ ] Pap smear
[ ] Cervical/vaginal cultures
for: [ ] group B streptococcus
[ ] gonorrhoea
[ ] chlamydia
[ ] yeasts
[ ] trichomonas
[ ] gardenerella
[ ] Swabs for C&S (eg. wounds)
[ ] Viral swabs for herpes
[ ] Urine
for: [ ] routine
[ ] microscopic analysis
[ ] C&S
[ ] Blood Group & Type with Antibody Screen
[ ] Hepatitis Screen
[ ] Repeat Antibody Screen
[ ] Haemoglobin
[ ] Haematocrit
[ ] Glucose Screen Specify_____
[ ] White Blood Cell Count
[ ] Differential
[ ] Platelet Count
[ ] Red Blood Cell Morphology
[ ] Sickle Cell Solubility
[ ] Kleihauer
[ ] Rubella
[ ] Syphylis Serology
[ ] Toxoplasmosis Antibody
[ ] Cytamegalo Virus Antibody
[ ] HIV Antibody Screen
[ ] Non-stress Test
[ ] Other Specify_____
[ ] None
[ ] Unknown

2. **Drugs prescribed by Midwife during the Antepartum**
(check all that apply; if more than once, indicate number)

[ ] Calcium gluconate
[ ] Clotrimazole
[ ] Dimenhydrinate hydrochloride
[ ] Doxylamine succinate-pyridoxine hydrochloride
[ ] Entonox
[ ] Epinephrine hydrochloride
[ ] Ergometrine maleate
[ ] Hydralazine
[ ] Hydrocortisone
[ ] Intramuscular oxytocin
[ ] Intravenous oxytocin
[ ] Intravenous fluids
[ ] Lidocaine with epinephrine
[ ] Lidocaine without epinephrine
[ ] Magnesium sulphate
[ ] Miconazole
[ ] Nystatin
[ ] Promethazine
[ ] RhD immune globulin
[ ] Therapeutic oxygen
[ ] Other Specify_____
[ ] None
[ ] Unknown

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3. **Drugs, Tests and/or Procedures ordered/prescribed by Health Care Provider other than Midwife during the Antepartum**
(include all known; if more than once, indicate number)
[ ] Alpha-fetoprotein Screen
[ ] Amniocentesis
[ ] CVS
[ ] Biophysical Profile
[ ] Specify_____
[ ] Specify_____
[ ] None
[ ] Unknown

Postpartum (Information obtained from mother at her final follow-up visit)

1. **Maternal Outcome** (up to 28 days)
[ ] Unknown
[ ] Home
[ ] Hospitalized from time of delivery, length of stay _____ days
[ ] Hospitalized following birth, length of stay _____ days
[ ] Maternal death in childbirth (up to 4 hours postpartum)
[ ] Maternal death at _____ days postpartum; Cause _____

2. **Neonatal Outcome** (up to 28 days)
[ ] Unknown
[ ] Home
[ ] Hospitalized from time of delivery, length of stay _____ days
[ ] Hospitalized following birth, length of stay _____ days
[ ] Stillborn; Cause _____
_____
[ ] Death at age ___ days; Cause _____

3. **Method of Feeding at Present**
[ ] Unknown
[ ] Breast
[ ] Bottle
[ ] Combination

4. **Neonatal Complications up to 28 Days**
[ ] Unknown
[ ] None
[ ] Congenital anomalies; Type: _____
[ ] Feeding problem
[ ] Jaundice
[ ] Metabolic problem
[ ] Pneumonia
[ ] Respiratory distress syndrome
[ ] Transient tachypnea
[ ] Seizures
[ ] Sepsis/infection (suspected or confirmed)
[ ] Other, List _____

5. **Tests/Procedures ordered by Midwife for Mother during the Postpartum**
(check all that apply; if more than once, indicate number)
[ ] Ultrasound Diagnostic
[ ] Pap smear
[ ] Cervical/vaginal cultures
for: [ ] group B streptococcus
[ ] gonorrhoea
[ ] chlamydia
[ ] yeasts
[ ] trichomonas
[ ] gardenerella
[ ] Swabs for C&S (eg. wounds, episiotomy)
[ ] Viral swabs for herpes

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5. **Cont'd**
[ ] Urine
for: [ ] routine
[ ] microscopic analysis
[ ] C&S
[ ] Blood Group & Type
[ ] Hepatitis Screen
[ ] Haemoglobin
[ ] Haematocrit
[ ] White Blood Cell Count
[ ] Differential
[ ] Platelet Count
[ ] Red Blood Cell Morphology
[ ] Syphylis Serology
[ ] Toxoplasmosis Antibody
[ ] Cytamegalo Virus Antibody
[ ] HIV Antibody Screen
[ ] Other Specify_____
[ ] Other Specify_____
[ ] None
[ ] Unknown

6. **Drugs prescribed by Midwife for Mother during the Postpartum**
(check all that apply; if more than once, indicate number)
[ ] Calcium gluconate
[ ] Clotrimazole
[ ] Dimenhydrinate hydrochloride
[ ] Epinephrine hydrochloride
[ ] Ergometrine maleate
[ ] Hydralozine
[ ] Hydrocortisone
[ ] Intramuscular oxytocin
[ ] Intravenous oxytocin
[ ] Intravenous fluids
[ ] Lidocaine with epinephrine
[ ] Lidocaine without epinephrine
[ ] Miconazole
[ ] Nystatin
[ ] Promethazine
[ ] RhD immune globulin
[ ] Other Specify_____
[ ] Other Specify_____
[ ] None
[ ] Unknown

7. **Drugs, Tests and/or Procedures ordered/prescribed for Mother by Health Care Provider other than a Midwife during the Postpartum**
(include all known; if more than once, indicate number)
[ ] Specify_____
[ ] Specify_____
[ ] Specify_____
[ ] None
[ ] Unknown

8. **Tests/Procedures ordered by Midwife for Newborn during the Postpartum**
(check all that apply; if more than once, indicate number)
[ ] Swabs for C&S (e.g. eyes, cord)
[ ] Urine
for: [ ] routine
[ ] microscopic analysis
[ ] C&S
[ ] Blood Group & Type
[ ] Haemoglobin
[ ] Haematocrit
[ ] White Blood Cell Count
[ ] Differential
[ ] Newborn Metabolic Screen
[ ] HIV Antibody Screen
[ ] Other Specify_____
[ ] None
[ ] Unknown

9. **Drugs prescribed by Midwife for Newborn during the Postpartum**
(check all that apply; if more than once, indicate number)
[ ] Nystatin
[ ] Other Specify_____
[ ] Other Specify_____
[ ] None
[ ] Unknown

10. **Drugs, Tests and/or Procedures ordered/ prescribed for Newborn by Health Care Provider other than a Midwife during the Postpartum** (include all known; if more than once, indicate number)
[ ] Specify_____
[ ] Specify_____
[ ] Specify_____
[ ] None
[ ] Unknown

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General Summary

1. **Intended birthplace at 36 weeks gestation was:**
   [ ] at home
   [ ] in hospital
   [ ] in birth centre

2. **Number of antenatal visits:**
   [ ] home
   [ ] clinic

3. **Estimated distance from intended birthplace to nearest hospital with maternity services:**
   travelling time: _____ minutes
   distance: _____ kilometres

4. **Total number of postnatal visits by midwife:**
   [ ] home
   [ ] clinic

5. **Total number of visits by community health nurse:**
   [ ] home
   [ ] clinic

6. **How many times was care of the client/newborn transferred to a physician?**
   client/mother _____ times
   newborn _____ times

7. **If you answered question 6 with a number other than '0', how many times was care of the client/newborn transferred back to the midwife?**
   client/mother _____ times
   newborn _____ times

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SUMMARY OF PROVINCIAL INTRAPARTUM RECORD AND BIRTH CARE

Intrapartum

1. Risk Score
_____ Antepartum Risk Score (36 weeks)
_____ Intrapartum Risk Score

1a. Labour Stimulation
[ ] None
[ ] Induction
[ ] Augmentation

2. Pain Relief Measures in Labour
(check all that apply)
[ ] None
[ ] Relaxation & breathing
[ ] Ambulation/position changes
[ ] Massage
[ ] Bath
[ ] Shower
[ ] Hypnosis
[ ] TENS
[ ] Other, List _____

3. Type of Delivery
[ ] NSVD, Cephalic
[ ] NSVD, Breech
[ ] Low forceps delivery
[ ] Mid-forceps delivery
[ ] High forceps delivery
[ ] Vacuum extraction
[ ] Caesarean section
[ ] Other, List _____

3a. Waterbirth
[ ] Bath
[ ] Shower
[ ] Other, Specify_____

4. Episiotomy (select one)
[ ] None
[ ] Mediolateral
[ ] Midline
[ ] Sphincterotomy (intentional 3rd degree)

5. Birth Canal Lacerations/Extensions
(check all that apply)
[ ] None
[ ] Minor of any type (not repaired)
[ ] 1st degree perineal (repaired)
[ ] 2nd degree perineal (repaired)
[ ] 3rd degree perineal (repaired)
[ ] 4th degree perineal (repaired)
[ ] Cervical (repaired)
[ ] Labial (repaired)
[ ] Periurethral/periclitoral (repaired)
[ ] Vaginal (repaired)
[ ] Other, List _____

6. Placenta Delivery (select one)
[ ] Spontaneous (maternal effort only)
[ ] Assisted (cord traction)
[ ] Crede and/or Brandt-Andrews
[ ] Manual (manual removal of all or part of placenta/membranes, gauze curettage)
[ ] Surgical (removal of all or part of placenta/membranes during C/S or with metal curette)
[ ] Other, Describe_____

7. Birth weight
[ ] < 2500 grams
[ ] 2501 - 4500 grams
[ ] > 4500 grams

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8. Apgars
One minute Apgar: _____
Five minute Apgar: _____

9. Immediate Newborn Procedures (check all that apply)
[ ] Unknown
[ ] None
[ ] Bulb suction before shoulders born
[ ] Bulb suction after entire body born
[ ] DeLee suction before shoulders born
[ ] DeLee suction after entire body born
[ ] Wall suction before shoulders born
[ ] Wall suction after entire body born
[ ] Direct visualization of cords for meconium
[ ] Stimulation
[ ] Oxygen
[ ] Positive pressure by mask
[ ] Positive pressure by intubation
[ ] Cardiac massage
[ ] Other, List_____

10. Tests/Procedures ordered by Midwife for Mother during the Intrapartum (check all that apply; if more than once, indicate number)
[ ] Ultrasound Diagnostic
[ ] Cervical/vaginal cultures
for: [ ] group B streptococcus
[ ] gonorrhoea
[ ] chlamydia
[ ] yeasts
[ ] trichomonas
[ ] gardenerella
[ ] Swabs for C&S (eg. wounds, episiotomy)
[ ] Viral swabs for herpes
[ ] Urine
for: [ ] routine
[ ] microscopic analysis
[ ] C&S
[ ] Blood Group & Type
[ ] Hepatitis Screen
[ ] Haemoglobin
[ ] Haematocrit
[ ] White Blood Cell Count
[ ] Differential
[ ] Platelet Count
[ ] Red Blood Cell Morphology
[ ] HIV Antibody Screen
[ ] Other Specify_____
[ ] Other Specify_____
[ ] None
[ ] Unknown

11. Drugs prescribed by Midwife for Mother during the Intrapartum (check all that apply; if more than once, indicate number)
[ ] Entonox
[ ] Calcium gluconate
[ ] Clotrimazole
[ ] Dimenhydrinate hydrochloride
[ ] Epinephrine hydrochloride
[ ] Ergometrine maleate
[ ] Hydralazine
[ ] Hydrocortisone
[ ] Intramuscular oxytocin
[ ] Intravenous oxytocin
[ ] Intravenous fluids
[ ] Lidocaine with epinephrine
[ ] Lidocaine without epinephrine
[ ] Magnesium sulphate
[ ] Promethazine
[ ] RhD immune globulin
[ ] Other Specify_____
[ ] None
[ ] Unknown

12. **Drugs, Tests and/or Procedures ordered/prescribed for Mother by Health Care Provider other than a Midwife during the Intrapartum** (include all known; if more than once, indicate number)
[ ] Narcotics
[ ] Epidural
[ ] Specify_____
[ ] Specify_____
[ ] None
[ ] Unknown

13. **Tests/Procedures ordered by Midwife for Newborn during the Intrapartum** (check all that apply; if more than once, indicate number)
[ ] Swabs for C&S (e.g. eyes, cord)
[ ] Urine
for: [ ] routine
[ ] microscopic analysis
[ ] C&S
[ ] Haemoglobin
[ ] Haematocrit
[ ] White Blood Cell Count
[ ] Differential
[ ] Other Specify_____
[ ] None
[ ] Unknown

14. **Drugs prescribed by Midwife for Newborn during the Intrapartum** (check all that apply; if more than once, indicate number)
[ ] Erythromycin Opthalmic Ointment
[ ] Phytonadione
[ ] Other Specify_____
[ ] Other Specify_____
[ ] None
[ ] Unknown

15. **Drugs, Tests and/or Procedures ordered/prescribed for Newborn by Health Care Provider other than a Midwife during the Intrapartum** (include all known; if more than once, indicate number)
[ ] Cord Blood Gases
[ ] Blood Group & Type
[ ] HIV Antibody Screen
[ ] Specify_____
[ ] Specify_____
[ ] Specify_____
[ ] None
[ ] Unknown

Birth Care

1. **Intended birthplace at onset of labour was:**
[ ] at home
[ ] in hospital
[ ] in birth centre
[ ] unknown
[ ] other

2. **Birth took place:**
[ ] at home
[ ] in hospital
[ ] in birth centre
[ ] other

3. **Birth took place on:**
Date_____
Time_____
Gestational age at birth _____ completed weeks

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For Home Births

4. **If birth was intended in hospital but took place at home, reason was:**
   [ ] client preference (client changed her mind in labour)
   [ ] decision by midwife/client because of change in risk assessment (clinical, weather, road conditions, etc.)
   [ ] other, please specify: _____

5. **Primary midwife arrived at client home for birth on:**
   Date_____
   Time_____

6. **If birth took place at home, was second midwife in attendance:**
   [ ] Yes
   [ ] No
   If no, why not?
   _____

7. **Primary midwife left client home on:**
   Date_____
   Time_____

8. **If birth took place at home, did birth take place as a result of a client request that fell outside midwives' standards of practice?**
   [ ] Yes
   [ ] No

For Hospital Births

9. **Name of Hospital:**
   _____

10. **If birth was intended at home but took place in hospital, reason was:**
    [ ] client preference (no change in risk assessment)
    [ ] a transfer of care
    [ ] decision by midwife/client because of change in risk assessment (clinical, weather, road conditions, etc.)
    [ ] other, please specify:
    _____

11. **If birth was screened out of an out-of-hospital birth after 36 weeks gestation, at how many weeks gestation did that occur?**
    _____weeks or
    [ ] during labour.

12. **Were hospital staff notified prior to arrival at hospital ?**
    [ ] Yes
    [ ] No
    Date_____
    Time_____
    Comments: _____

13. **How did client come to hospital?**
    [ ] Car
    [ ] Ambulance
    [ ] Other

14. **Client arrived at hospital on:**
    Date_____
    Time_____

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15. Did midwife accompany client to hospital?
[ ] Yes
[ ] No
If, no, was midwife present when client arrived at hospital
[ ] Yes
[ ] No
Time midwife arrived at hospital:_____

16. Was client admitted directly to:
[ ] LDR
[ ] OR
[ ] Other_____

17. Did attending midwife have admitting privileges at hospital?
[ ] Yes
[ ] No

18. Was second midwife in attendance?
[ ] Yes
[ ] No
If no, why not? _____

19. Client left hospital after birth on:
Date_____
Time_____

20. Did any hospital staff have a role in the clients care?
[ ] Yes
[ ] No
If yes, which staff:
[ ] nurse
[ ] physician
[ ] clerical staff
[ ] support staff
[ ] other

If yes, how did the role of the hospital staff affect the clients birth experience
_____

21. Did you feel the hospital birth went smoothly?
[ ] Yes
[ ] No
Comments:_____
_____

For Birth Centre Births

22. If birth was intended at home or hospital but took place in a birth centre, reason was:
[ ] client preference (client changed her mind during labour)
[ ] decision by midwife/client because of change in risk assessment (clinical, weather, road conditions, etc.)
[ ] other, please specify:

23. Were birth centre staff notified prior to arrival at birth centre?
[ ] Yes
[ ] No
Date_____
Time_____
Comments:_____
_____

24. How did client come to birth centre?
[ ] Car
[ ] Ambulance
[ ] Other

25. Client arrived at birth centre on:
Date_____
Time_____

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26. Did midwife accompany the client to the birth centre?
[ ] Yes
[ ] No
If, no, was midwife present when client arrived at the birth centre
[ ] Yes
[ ] No
If no, time midwife arrived at the birth centre _____

27. Was second midwife in attendance?
[ ] Yes
[ ] No
If no, why not? _____

28. Client left birth centre after birth on:
Date_____
Time_____

29. Did any birth centre staff have a role in the clients care?
[ ] Yes
[ ] No
If yes, which staff:
[ ] nurse
[ ] physician
[ ] clerical staff
[ ] support staff
[ ] other
If yes, how did the role of the birth centre staff affect the clients birth experience?
_____
_____

30. Did you feel the birth centre birth went smoothly?
[ ]Yes
[ ] No

Comments:_____
_____

For Birth that occurred at other than Home, Hospital or Birth Centre

31. Birth took place at:_____

32. Reason birth took place at other than home, hospital or birth centre was:
[ ] client preference (client changed her mind during labour)
[ ] decision by midwife/client because of change in risk assessment (clinical, weather, road conditions, etc.)
[ ] unintentional
[ ] other, please specify:_____

33. Was attending midwife in attendance?
[ ]Yes
[ ] No
If not, why not? _____

34. Was the second midwife in attendance?
[ ] Yes
[ ] No
If not, why not? _____

35. Was any other health care professional in attendance?
[ ] Yes
[ ] No
If yes, what was the profession/discipline of the health care provider?
_____

36. Did you feel the birth went smoothly?
[ ] Yes
[ ] No
Comments:_____
_____

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INDICATIONS FOR CONSULTATION AND/OR TRANSFER OF CARE

(to be filled out by midwife for all clients)

The Midwifery Regulation states that if the result of **consultation** is a determination that management by a physician is required, the midwife shall **transfer** primary responsibility for care, or aspects of care, to a physician; and may engage in the practice of midwifery in collaboration with the physician, to the extent agreed to by the client, physician and midwife.

Was there a need to consult with another health care professional?
[ ] Yes [ ] No

Were you always able to obtain consults when needed?
[ ] Yes [ ] No

If no, please comment: _____

_____

_____

_____

Legends

Please use the following legends to complete the questionnaire.

Professionals		Professionals Cont'd		Result of Consultation	
RM	registered midwife	**CH**	chiropractor	**C**	straight consult
PHN	public health nurse	**SW**	social worker	**T**	transfer of care (permanent)
GP	general practitioner	**COMP**	complementary medical practioner (ie. herbalist, naturopath)		
OB	obstetrician			**TB**	transfer (short-term, then transferred back)
PN	perinatologist				
LC	lactation consultant	**PHYSIO**	physiotherapist	**SH**	shared care
AN	anesthetist	**OTHER**	(specify)		

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1. Consultations/Transfers - Initial History and Physical Examination

Indications	With Whom [see legend]	Date	Result of Consult [see legend]
[ ] Current medical conditions ie. Cardiovascular, renal, pulmonary, hepatic disease, endocrine, neurologic, hypertensive disorders, IDDM.			
[ ] Congenital defect(s) of the reproductive system			
[ ] Family history of genetic disorders, hereditary disease and/or congenital anomalies			
[ ] History of repeated spontaneous abortions			
[ ] History of severe postpartum hemorrhage			
[ ] History of severe psychological problems			
[ ] History of 2 or more consecutive premature labours or history of low birth weight infant(s)			
[ ] History of severe pregnancy induced hypertension			
[ ] Marked skeletal abnormalities			
[ ] Previous operations or injuries to the uterus or vagina ie. Operations for prolapse, cervical conization, myomectomy, vesicovaginal and recto-vaginal fistulae, classical cesearean section			
[ ] Previous stillbirth or neonatal loss which may affect the current pregnancy			
[ ] Rh isoimmunization or the presence of other blood group antibodies which may adversely affect the fetus			
[ ] Significant use of drugs, alcohol or other toxic substances			
[ ] Suspected or diagnosed congenital anomaly that may require immediate medical management after delivery			
[ ] Repeated vaginal bleeding this pregnancy			
[ ] Non-medical or other indications for consultation [specify]			

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2. Consultations/Transfers - Prenatal Care

Indications	With Whom [see legend]	Date	Result of Consult [see legend]
[ ] Medical conditions arising from or exacerbated during the prenatal period ie. Cardiac disease, IDDM, endocrine disorders, hypertension, renal disease, acute pyelonephritis, thromboembolic disease, significant infection			
[ ] Abnormal fetal growth pattern			
[ ] Abnormal Pap smear			
[ ] Active sexually transmitted diseases or known HIV+			
[ ] Persistent anemia			
[ ] Antepartum fetal death			
[ ] Documented post-term pregnancy			
[ ] Exposure to known teratogens			
[ ] Fetal anomaly			
[ ] Hyperemesis			
[ ] Multiple pregnancy			
[ ] Persistent abnormal presentation			
[ ] Persistent abuse of drugs or alcohol			
[ ] Polyhydramnios or oligohydramnios			
[ ] Pregnancy induced hypertension, persistent proteinuria or other signs of pre-eclampsia			
[ ] Threatened premature labour			
[ ] Rh isoimmunization or presence of other blood group antibodies which may adversely affect the fetus			
[ ] Serious psychological problems			
[ ] Continued or unexplained vaginal bleeding			
[ ] Unexplained sudden and severe abdominal pain			
[ ] Rupture of membranes before term			
[ ] Other indications [specify]			

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3. Consultations/Transfers - Intrapartum

Indications	With Whom [see legend]	Date	Result of Consult [see legend]
[ ] Abnormal fetal heart patterns unresponsive to therapy			
[ ] Abnormal presentation			
[ ] Active genital herpes at onset of labour			
[ ] Ketonuria unresponsive to treatment			
[ ] Multiple pregnancy			
[ ] Excessive vaginal bleeding			
[ ] Unexplained sudden and severe abdominal pain			
[ ] Premature labour			
[ ] Abnormal labour pattern unresponsive to therapy			
[ ] Prolonged rupture of membranes			
[ ] Prolonged second stage			
[ ] Pregnancy induced hypertension or other signs of pre-eclampsia			
[ ] Prolapsed cord			
[ ] Retained placenta			
[ ] Thick meconium			
[ ] Uterine rupture			
[ ] Other indications [specify]			

4. Consultations/Transfers - Postpartum (Maternal)

Indications	With Whom [see legend]	Date	Result of Consult [see legend]
[ ] Lacerations involving the anus, anal sphincter, rectum or urethra area			
[ ] Hemorrhage unresponsive to therapy			
[ ] Inversion of uterus			
[ ] Persistent hypertension			
[ ] Post partum eclampsia			
[ ] Serious psychological problems			
[ ] Signs of puerperal infection			
[ ] Suspected retained placental fragments or membranes			
[ ] Thrombophlebitis or thromoboembolism			
[ ] Breast infection unresponsive to therapy			
[ ] Other indications [specify]			

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5. Consultations/Transfers - Post partum (Infant)

Indications	With Whom [see legend]	Date	Result of Consult [see legend]
[ ] APGAR lower than 7 at 5 minutes			
[ ] Abnormal findings of physical exam ie. Abnormal cry, abnormal heart rate or pattern, abnormal movement of any extremity, abnormal neurological signs including hypotonia			
[ ] Abnormal abdominal distention			
[ ] Respiratory distress			
[ ] Excessive bruising other than a cephalhematoma and/or generalized petechia			
[ ] Failure to pass urine within 24 hours or meconium within 48 hours of birth			
[ ] Feeding intolerance with vomiting and diarrhea			
[ ] Less than 3 vessels in umbilical cord			
[ ] Congenital anomalies			
[ ] Persistent cynanosis or pallor			
[ ] Suspected pathological jaundice			
[ ] Infection of umbilical stump site			
[ ] Seizure-like activity			
[ ] Significant weight loss			
[ ] Temperature above or below normal that is unresponsive to therapy			
[ ] Conditions that cause concern in either the parents or the midwife			
[ ] Other indications [specify]			

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TRANSPORT

(to be filled out by midwife, only if transport occurred)

All Transports

1. **During which part of care did transport occur? (If transport occurred more than once during course of care, please complete a separate form for each transport).**
   [ ] Antepartum
   [ ] Intrapartum
   [ ] Postpartum
   [ ] Newborn
   Reason for transport: _____

2. **Transport was:**
   [ ] Non-emergency
   [ ] Emergency

3. **Date of transport:**
   Date: _____
   Time of departure: _____
   Time of arrival: _____

4. **Notification of hospital staff prior to arrival at hospital:**
   Date: _____
   Time: _____
   Comments: _____

5. **Notification of consulting physician prior to arrival at hospital (if applicable):**
   Date: _____
   Time: _____
   Comments: _____

6. **Client transported by:**
   [ ] Car
   [ ] Ambulance
   [ ] Other _____

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7. Midwife accompanied client to hospital:
[ ] Yes
[ ] No
If no, time midwife arrived at hospital_____
If no, reason _____

8. Client admitted directly to:
[ ] LDR
[ ] OR
[ ] Other _____

9. Copies of prenatal and intrapartum records provided to hospital staff:
[ ] Yes
[ ] No

10. Attending midwife has admitting privileges at hospital:
[ ] Yes
[ ] No

11. Transfer of care to physician:
[ ] Yes
[ ] No

Physician receiving transfer of care was on premises at arrival:
[ ] Yes
[ ] No

If no, who took responsibility for care of client?_____
If transfer of care took place, did the midwife continue to provide supportive/collaborative care in hospital?
[ ] Yes
[ ] No

If no, was the midwife absent because of:

client's request	[ ] Yes	[ ] No
midwife's decision	[ ] Yes	[ ] No
physician's request	[ ] Yes	[ ] No
hospital's request	[ ] Yes	[ ] No

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Did you feel the transfer of care went smoothly?
[ ] Yes
[ ] No
Comments:_____

12. **Who had primary responsibility for postpartum maternal care?**
[ ] midwife
[ ] family physician
[ ] obstetrician
[ ] other _____

13. **Who had primary responsibility for newborn care?**
[ ] midwife
[ ] family physician
[ ] obstetrician
[ ] other _____

To be completed in addition if transport was an emergency

14. **911 Call (or other emergency number):**
[ ] Yes
[ ] No
If yes: time ambulance called: _____
time ambulance arrived: _____
time ambulance left for the hospital: _____
time ambulance arrived at hospital: _____

15. **Provision of care at home:**
[ ] midwife
[ ] EMS
[ ] both

16. **Primary responsibility for care in ambulance:**
[ ] midwife
[ ] EMS
Comments:_____
_____
_____
_____

OTHER HEALTHCARE PROVIDER QUESTIONNAIRE

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TRANSPORT OF MIDWIFERY CLIENTS

(to be completed by Hospital Staff)

To be completed by nurse or physician who has been involved in the care of a midwifery patient who has been transported to hospital. Please mail the completed form to Project Director of the Integration of Midwifery Services Evaluation Project in attached stamped, addressed envelope. If you wish, you can reach the Project Director at 1-877-643-7765.

Name of Hospital:_____

Your Position:_____

In All Situations

1. **Copy of prenatal records given to hospital staff?**
   [ ] Yes
   [ ] No
   [ ] N/A

2. **Copy (if in labour) of intrapartum records given to hospital staff?**
   [ ] Yes
   [ ] No
   [ ] N/A

3. **Hospital notified by telephone and apprised of reason for transport and approximate time of patient's arrival?**
   [ ] Yes
   [ ] No
   [ ] Telephone call made but information incomplete.

4. **Who was providing primary care to the patient on arrival?**
   [ ] Midwife
   [ ] EMS
   [ ] Other _____

5. **How much time elapsed between patient's arrival and patient being assessed by a physician?**
   _____ hours _____ minutes

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6. **If care was transferred from a midwife to a physician, was it transferred back to the midwife again?**
   [ ] Yes
   [ ] No
   [ ] N/A

7. **Did it appear to you that the transfer of care went smoothly?**
   [ ] Yes
   [ ] No
   [ ] N/A
   Comments:_____
   _____

In Non-emergency Situations

8. **On arrival, midwife, if accompanying patient, gave a verbal report outlining patient's current clinical situation?**
   [ ] Yes
   [ ] No
   [ ] N/A

In an Emergency Situation

9. **Hospital apprised of patients clinical condition prior to arrival?**
   [ ] Yes
   [ ] No

10. **Midwife communicated with consulting physician?**
    [ ] Yes
    [ ] No
    [ ] N/A

11. **On arrival, midwife, if accompanying patient, gave a verbal report outlining patient's current clinical situation?**
    [ ] Yes
    [ ] No
    [ ] N/A

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12. If patient arrives by ambulance, not accompanied by midwife, emergency medical attendants are able to pass on report given by midwife to them?

[ ] Yes
[ ] No
[ ] N/A

Please use this space to add any further comments you wish.

Thank you for assisting in the evaluation of the integration of midwifery services into the province of Alberta.

APPENDIX K

Pilot Study of Instruments and Questionnaires

Forty-five sets of questionnaire were distributed to 15 practising midwives in the five participating health regions in Alberta. The midwives were instructed to use these forms with existing clients to evaluate their clarity and comprehensiveness as well as the response burden. They were also asked to identify procedural difficulties. Fifteen (33.3%) completed or partially completed sets of questionnaires were returned with comments and suggestions for improvement by the completion date of the pilot testing. During the time the pilot testing, three suggestions for improving the questionnaires were received from the study costing consultant as a result of data base development. These suggestions were incorporated into the revised forms.

No suggestions for procedural change were received. The returned questionnaire sets and suggestions were reviewed and the following revisions were made.

Summary of provincial Records and General Care

1. The inadvertent omission of six demographic data questions from the questionnaires at the time of printing was noted and they were reinserted.
2. One question was revised to included standard categories of education and one new question was created to capture data related to levels of income.
3. A space to document initial risk sore was added.
4. A question to capture data related to extended health care coverage was added
5. Four items in the section of "tests/procedures ordered by a midwife during the antepartum period" were moved to the section "tests/procedures ordered by health care provider other than midwife", as they were not included in the midwifery regulations.
6. A space to record performing a Pap test was added to the list of procedures by midwife at the postpartum visit.
7. On one question the phrase "home to hospital" was changed to "intended place of birth to nearest hospital with maternity services" to improve clarity.

Summary of Provincial Record and Birth Care

1. A question was added to ask whether or not a water birth occurred.
2. In two questions where the word "postpartum" had been used in error it was corrected to "intrapartum".

3. Three items in the section of "tests/procedures ordered for the newborn by a midwife" were moved to the section of "tests/procedures ordered by care provider other than midwife", as they were not included in the midwifery regulations.

4. Blood glucose was added to "tests/procedures ordered by a midwife for a newborn".

Indications for Consultations and/or Transfer of Care

1. Three typographical errors were corrected.

Breastfeeding Questionnaire

1. Two questions were added to elicit the apportionment of cost between the system and the client for emergency medical services and prescribed medication. The Breastfeeding Questionnaire was selected for these questions as it was to be administered by the project director in a six months postpartum telephone interview.