Midwifery and Home birth care in North Carolina as compared with the Republic of Ireland

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Introduction

In the United States and in the Republic of Ireland the majority of births occur in a hospital or hospital birth center. Reasons for this include strong historical precedents, social norms as well as economic drives including hospital marketing.\(^1\) Issues about birth setting have an influence on approximately 4 million births in the United States each year.\(^2\) In the U.S. and Ireland, home childbirth is a controversial issue. A growing number of mothers are seeking to deliver their infants at home. The practice of planning the delivery of an infant in the home, with a certified nurse-midwife attendant, has not been associated with significant adverse maternal or infant outcomes in low risk pregnancy.\(^3\-5\) In fact, in some studies home childbirth has been associated with positive outcomes and a variety of benefits compared with hospital births.\(^1\,6\-14\) In North Carolina, the demand for home birth deliveries is not being met by licensed providers and mothers who arrange deliveries attended by unlicensed providers may be at increased risk of avoidable maternal and infant morbidity and mortality.

Data on characteristics, safety and benefits of home births are primarily observational. For instance, the number of home births is estimated to be about 2% in both North Carolina and Ireland.\(^1\,15\) However, according to a personal communication with a certified professional midwife, some mothers who have a home delivery in North Carolina may not apply for a birth certificate. These home deliveries may go unrecorded.\(^16\) In addition, in North Carolina, because of the shortage of licensed attendants willing to provide a home childbirth, unlicensed midwives may be attending home births. Even less will be known about the outcomes of these deliveries. Are the mothers who are acquiring the services of unlicensed midwives being put at risk? More
information about what mothers are choosing a home birth and who is attending home deliveries in North Carolina are needed in order to determine what systems can be put in place to protect mothers and infants from potentially avoidable mortality and morbidity.

The purpose of this analysis is to also improve understanding of how factors such as policy, legislation and reimbursement of home birth influence the deliveries of mothers choosing home birth in North Carolina and Ireland. Understanding how these forces may inhibit access to cost-saving, potentially effective, and presumably beneficial alternatives to hospital delivery is important for future policy, research and obstetrical care practice decisions in North Carolina. This paper will analyze the feasibility of three possible options to improve on the lack of information and risk to safety in mothers seeking home birth in North Carolina. While there may be many others, these themes were prevalent in discussions with various elite informants and key stakeholders. The options are:

A. Instituting a requirement that no out-of-hospital deliveries occur.

B. Promoting an increase in the number of certified nurse-midwives in North Carolina.

C. Promoting legalization and therefore regulation of certified professional midwives in North Carolina.

These three options will be analyzed in comparison with current policies and practices.

Discussions of obstetrical care delivery systems are often biased by historical precedents, social ideals and political forces in the United States and Western Europe. Nonetheless, comparing models of care for pregnancy and delivery is important for understanding how policy, particularly in a culturally and politically sensitive issue as
management of pregnancy, may help to continue development of effective population-based models of maternal and child health care. The effectiveness of obstetrical care delivery systems is evaluated through the use of indicators including the maternal mortality rate, intrapartum mortality rate, neonatal mortality rate, rate of cesarean section, rate of low APGAR scores, infant health within 6 weeks postpartum, and maternal satisfaction.\textsuperscript{1, 6, 15, 18} Measures such as these are used to compare obstetrical care models, interventions, and other maternity care practices.

There is both a market and potentially a need for home birthing care in the United States and Ireland. Although less than 2\% of mothers in both the United States and the Republic of Ireland deliver at home, there is a growing interest in the maternal population in both countries to do so.\textsuperscript{1, 15} Research in the Republic of Ireland suggests that about 14\% of mothers who did not give birth at home expressed the desire for a home birth.\textsuperscript{15} In another Irish study, mothers who received antenatal care at the Rotunda, a maternity hospital in Dublin, approximately 10\% of women sampled stated that they would consider a home birth in a subsequent pregnancy.\textsuperscript{19} Similarly, in a pilot study of birthing choices in the United States, 20\% of mothers delivering in the hospital setting reported that they would have preferred non-hospital delivery but no medical support was readily available.\textsuperscript{20}

In the U.S. an obstetrician or family practitioner attends the majority of deliveries while a small but growing number are attended by certified nurse-midwives.\textsuperscript{4} In the Republic of Ireland the obstetrical care system includes obstetricians, general practitioners (GP), and nurse-midwives. Greater than 60\% of births in Ireland are delivered by midwives under the supervision of obstetricians and 99\% of births occur in
hospitals. In contrast to the majority of Western Europe, obstetricians are the primary maternity care leaders in Ireland despite the predominant presence of midwives in hospital births.

In this analysis, the policy, reimbursement and access to home births in the state of North Carolina are being compared with those of the Republic of Ireland. Current maternity care models in North Carolina and Ireland are different but interestingly comparable, in that they both use a medical model of birth. Additionally, to put these models in context, a brief description of an obstetrical care system such as that of the Netherlands, in which home birthing plays a significant role, will be included.

Methods

In order to gain information around home birth safety, benefits, cost-effectiveness and reimbursement, a brief PubMed search was conducted using key words “Home Childbirth/nursing, Midwifery, Natural Childbirth/nursing, Nurse Midwives, United States, safety, Health Care Costs, Cross-Cultural Comparison, Ireland, Cost-effectiveness, and Reimbursement”. In addition, input from elite informants on practice and policy was utilized to examine influences on the provision of home birth services in both North Carolina and the Republic of Ireland. Triangulation of public records, published literature, and expert opinion were used to formulate hypotheses.

Minimal criteria for evaluation of the policy options to be used in this analysis are acceptability to the target population (pregnant women), no evidence of greater risk of maternal or infant morbidity or mortality in comparison to hospital births, cost-
effectiveness, acceptability to dominant medical culture and the presence of structural systems in place to support the policy. (Please refer to Table 2)

**Background**

**Definitions**

1. **Midwifery in the United States**

   While many types of maternity care providers can conduct home births, including midwives, general practitioners, and obstetricians, it is important to discuss midwifery in the United States and in Ireland because they appear to be the main groups interested in providing home births. There is, however, a wide variability in midwifery training and regulation. It is often difficult, when trying to discern the evidence around efficacy and safety of home birth, to understand the training level and qualifications of home delivery attendants in each study. Different types of midwives play varying roles in the delivery of maternal care in both the U.S. and in Ireland.

   To begin a description of midwifery in the United States, a definition of the two advocacy and regulatory bodies is necessary. These two primary organizations, involved with the development and regulation of midwifery as a profession, are the American College of Nurse-Midwives (ACNM) and the Midwives’ Alliance of North America (MANA). The ACNM, established in 1955, supports education and certification of Certified nurse-midwives (CNM) as well as Certified Midwives (CM). The MANA, largely comprised of independent midwives, developed a separate system of certification via the North American Registry of Midwives (NARM). Midwives who are members of the MANA are not required to receive any certification.
There are at least 4 broad categories of midwives currently practicing in the United States, although the training, skills and experience within each category may be variable. These categories are: Certified Nurse-Midwife (CNM), Certified Midwife (CM), Certified Professional Midwife (CPM), and Midwife. In the context of defining midwifery, it is necessary to define ‘direct-entry’ which is a term commonly used to label three very different types of midwives. In its simplest definition, ‘direct-entry’ describes a midwife who has undergone midwifery training without first becoming a nurse. The term has been adopted by the MANA to replace the term ‘lay’ in describing its member midwives, including certified professional midwives. The ACNM, which helped to develop the Certified Midwife (CM) training path, describes its program as ‘direct-entry’ as well, because this certification also does not require a nursing degree. There is also a European definition of a ‘direct-entry’ midwife however midwives in the United States labeled ‘direct-entry’ may or may not fit the international definition developed by the World Health Organization (see below).

The International Definition of a Midwife (WHO)

A midwife is a person who, having been regularly admitted to a midwifery educational program duly recognized in the country in which it is located, has successfully completed the prescribed course of studies in midwifery and has acquired the requisite qualifications to be registered and/or legally licensed to practice midwifery. She must be able to give the necessary supervision, care and advice to women during pregnancy, labor and the postpartum period, to conduct deliveries on her own responsibility, and to care for the newborn and the infant. This care includes preventative measures, the detection of abnormal conditions in mother and child, the procurement of medical assistance, and the execution of emergency measures in the absence of medical help. She has an important task in health counseling and education, not only for the women, but also within the family and the community. The work should involve antenatal education and preparation for parenthood and extends to certain areas of gynecology, family planning and child care. She may practice in hospitals, clinics, health units, domiciliary conditions or in any other service.
The requirements for midwifery training for countries that are members of the European Community are explicitly outlined. Requirements include either at least a 3 year direct-entry course of midwifery including practical and theoretical studies and entry requirements of at least 10 years of general school education or a full time course of midwifery of at least 18 months after qualification as a general nurse.

**Certified Nurse-Midwife (CNM)**

In the United States, Mary Breckenridge pioneered the development of a system of nurse-midwifery, after the British model, to provide home childbirth care and other services to rural poor in Appalachia. This system, founded in 1925, was called the Frontier Nursing Service. Today, a CNM is a trained nurse who has received further training and certification in midwifery. To the public and to other medical professions, Certified nurse-midwives constitute a legitimate and trustworthy profession, and can legally practice and receive reimbursement for care in all 50 states. In addition, some states give Certified nurse-midwives legal prescriptive authority. Of note, while many Certified nurse-midwives strive to balance medical and midwifery models of care, the balance is often tipped to the medical side through accommodation to hospital policies, the maintenance of good working relationships with physicians and nurses, and the common preference of American women to have delivery medically controlled.

Very few Certified nurse-midwives in the United States (estimated to be < 3%) attend births in homes. This may be due to lack of training for home birthing, the need for physician collaboration and/or insurance restrictions. In addition, because they predominantly work in the hospital and have reduced autonomy, Certified nurse-
midwives are vulnerable to managed care cutbacks and physicians’ resistance to competition.

**Certified Midwife**

The ACNM expanded its definition of midwifery in order to support a new ‘direct-entry’ midwifery program termed a Certified Midwife (CM). The Certified Midwife program is intended to provide access to midwifery for those students who do not want to go through nursing training. It is also hoped that Certified Midwives will be able to move towards more autonomous practice. At present, the only Division of Accreditation (DOA) accredited program is a 2-year curriculum at the State University of New York (SUNY). The program mirrors current CNM education and requires certification with the same examination as a CNM upon completion of the CM curriculum. Entry requirements include obtainment of a baccalaureate in any field and courses to satisfy basic science requirements. The ability of a CM to practice may be limited by state regulations and the political climate of different regions of the United States. In states that require a nursing degree in order to practice midwifery, such as North Carolina, a CM may not be able to obtain a license, malpractice coverage, or reimbursement for midwifery services until regulatory statutes are changed.

**Certified Professional Midwife**

In contrast to Certified nurse-midwives, midwives associated with the MANA, such as certified professional midwives (CPM), are outside the dominant medical culture, work independently, and consciously avoid medicalization of low risk childbirth. A CPM
specifically trains in order to maintain the home-birth option.\textsuperscript{22} Certified professional midwives are a diverse group of midwives who have undergone either program or apprentice-based training. The evidence-based knowledge and skills of NARM-certified professional midwives are very different from those of most untrained birth attendants.\textsuperscript{22} CPMs are legal, regulated, licensed, registered or certified in fourteen states (Alaska, Arkansas, Arizona, California, Colorado, Florida, Louisiana, Montana, New Hampshire, New Mexico, Oregon, South Carolina, Texas, and Washington).\textsuperscript{22} They are legal through judicial interpretation or statutory inference in an additional nineteen states. CPMs are effectively prohibited in eight states where licensure is required but unavailable, and illegal in nine states, including North Carolina, and the District of Columbia.\textsuperscript{22} Certified professional midwives often work alone or in practices with one or two primary midwives and, ideologically, subscribe to MANA’s commitment to out-of-hospital birth.\textsuperscript{22}

The North American Registry of Midwives (NARM) is a testing and certifying agency which designs, develops, and implements the credentialing process for CPM. The credential is competency based, including a portfolio process requiring a certain number of prenatal visits, delivery assists, and deliveries as the primary caregiver. These competencies are evaluated by mentor or educational supervisor report and by hands-on skills testing.\textsuperscript{22} The evaluation and quality assurance of home birth practices is not available as it would be in a hospital system. The expectation for home birth practices is evaluation by peer review, such as the 5 contact hours required for NARM recertification, to maintain quality of care.\textsuperscript{22,26}
\textit{Other Midwives}

There are a group of midwives who are voting members of the MANA but are not certified according to the NARM credential. The skills, training, and experience of these midwives, licensed and unlicensed, vary widely and the choice to remain uncertified may actually be a personal or ideological one. The Task Force on Midwifery in the Midwives Model of Care has defined the ideal held by these midwives and other members in the Midwives’ Alliance of North America (MANA). The Midwives Model of Care includes “monitoring the physical, psychological and social well-being of the mother throughout the childbearing cycle; providing the mother with individualized education, counseling, and prenatal care; continuous hands-on assistance during labor and delivery and postpartum support; minimizing technological interventions; and identifying and referring women who require obstetrical attention.”  \cite{27}

\section*{2. Midwifery in Ireland}

Until the 1900's childbirth in Ireland was unregulated and midwives were uncertified. In 1918, Great Britain’s Midwives' Act (1902) was extended to Ireland, bringing midwives under medical control of the British Central Midwives Board.\cite{28} Midwives worked in hospitals and were employed throughout the country, in dispensary districts, as part of medical service to the poor.\cite{14,28} Registration under the Central Midwives Board required women to have 1 year of experience and be ‘of good character’.\cite{14} By 1931 lay midwives, or ‘handywomen’, were unable to attend deliveries in Ireland. In 1952, regulation of midwifery in Ireland was turned over from the Central Midwives Board to the Irish Nursing Board, An Bord Altranais.
In present-day Ireland, midwifery training is generally comparable to that of the certified nurse-midwife training path in the United States and fulfills the requirements of the European Community. In Ireland, prior to entering a two-year full-time midwifery program, each student must first qualify as a general nurse. During education, midwifery students are employees of the institution at which they train, and receive a salary and other benefits. Midwives in Ireland practice at the standard set forth by the European Community, and are eligible to practice in both hospital and community settings in Ireland.\textsuperscript{29} There is also currently a pilot midwifery-training program in place in Ireland to begin the full training of midwives via a direct-entry route.

The practice of midwifery is developing in Ireland, with a move towards greater autonomy.\textsuperscript{29} The majority of midwives in Ireland work in a hospital in conjunction with obstetricians. Midwives do not have authority to write prescriptions.\textsuperscript{14} While any registered midwife may move into the community and private practice to provide home births independently, few midwives choose to do so. From the perspective of an obstetrician in Dublin, communication between independent midwives and the maternity hospitals is very poor. In addition, the current system of Irish midwifery training may not ensure that independent midwives have experience in managing home births.\textsuperscript{14}

3. Planned Home birth

A planned home birth is defined as a pregnancy in which the mother intends to deliver at home, the pregnancy meets defined medical and environmental criteria for an optimal perinatal course, has a qualified birth attendant(s) that provide access to equipment, specialized personnel, and/or hospitalization when necessary.\textsuperscript{6}
4. Low Risk Pregnancy

It is difficult to define “low risk” in the context of a mother’s risk of a complicated delivery as criteria may differ based on region. From a study conducted in British Columbia, exclusion criteria that would render a mother ineligible for home birth according to policy set by the Home Birth Demonstration Project and College of Midwives of British Columbia:

1. Multiple birth
2. Heart Disease (Class I-IV or unknown)
3. Hypertensive Chronic Renal disease
4. Pregnancy-induced hypertension with proteinuria (>30 mg/dL) diagnosed in antepartum period
5. Insulin-dependent Diabetes Mellitus, either pre-existing or gestational
6. Antepartum hemorrhage after 20 weeks gestation
7. Active genital herpes
8. Breech or other abnormal presentation
9. Gestational age less than 37 weeks or greater than 41 weeks at the onset of labor
10. More than one previous cesarean section
11. Mother transferred to hospital from another facility

A standard method of defining low risk would be appropriate for comparison of women across birth settings, regions, and hospital systems. Unfortunately, there is little evidence supporting a set of criteria that precisely determines which women will have complicated deliveries. The Netherlands employs a specific set of criteria\textsuperscript{31, 32}, however in Ireland and North Carolina screening tools vary and midwives often determine eligibility of mothers on an individual basis.\textsuperscript{14}
Home Birth in the Netherlands

In the Netherlands, mothers who are determined to be of low risk status based on standardized criteria are offered a choice of a home birth or a short-stay hospital birth with follow-up postpartum home care. This system has been supported by national policy in the Netherlands. The government actively promotes home birth for women with low-risk pregnancies without restricting freedom of choice. Maternity care in the Netherlands places strong emphasis on the distinction between physiology and pathology in pregnancy. This system of care is also facilitated by the geography of the Netherlands, which is such that most women are within 20 minutes of a hospital. In this system, a mother’s choice to give birth at home is considered to be a responsible one, not a matter of radical statement as it is in most other industrialized countries. In the literature, home birth in the Netherlands is described as a public health service to protect a mother from unnecessary medical interventions.

Despite this goal, the incidence of home birth in the Netherlands has dropped to 30% as the result of a significant decline over the last 30 years. In 1965 the percentage of home births in the Netherlands was 68.5%, by 1975 that number had decreased to 35.8%. At present, however, the frequency of interventions such as instrumental vaginal delivery and cesarean section are significantly lower in the Netherlands than other Western European countries.

Midwives in the Netherlands are trained under a competitive and rigorous four year curriculum that is government funded and directed. Midwives are trained to work independently, and are given ample opportunities to work with home birthing.
Approximately 70% of graduates from the three Dutch midwifery schools enter into private solo or group practice.

The system of home birth care maintained in the Netherlands is unlikely to be amenable culturally or structurally to regions such as North Carolina and Ireland. However the Netherlands’ model of maternity care is an example of a model that keeps a choice available to low risk mothers, whether they wish to deliver in the hospital or at home, while achieving good reproductive outcomes. To date, there is no conclusive evidence that pregnancy outcomes are harmfully impacted by the frequency of home birth in the Netherlands. In 2002, the infant mortality rate in the Netherlands was 5.1 per 1000 live births (Ireland: 5.1 per 1000 live births in 2002; USA: 7.0 per 1000 live births in 2002). A study in the Netherlands assessing risk of perinatal mortality demonstrated that there was no correlation between the proportion of hospital-based births in a region of the Netherlands and the region’s perinatal mortality. While factors influencing perinatal and infant mortality are numerous, this suggests that a home birthing model of care can be safe and effective. A more detailed description of the evidence surrounding safety of home birth will follow.

**Evidence for Safety of Home Childbirth**

A growing but still limited body of literature suggests that for low risk pregnancy, planned home birthing may be a safe alternative to hospital birth. There is currently no Level I or conclusive Level II evidence describing whether a hospital born infant will fare better or worse than a home born infant in the short or long term. Because the relative safety of home and hospital birth cannot ethically be studied in a randomized controlled
trial, observational studies continue to be the primary source of data. Both retrospective and prospective observational studies have been conducted.\textsuperscript{7,9,11,30} Many studies have been too small and lack power to detect differences in rare outcomes such as maternal and perinatal mortality.\textsuperscript{7}

An analysis by Vedam\textsuperscript{6} offered criteria for optimizing the quality of data gathered on home childbirth. While these criteria have not been validated, they provide one guideline for assessing studies. According to this criteria, studies evaluating safety and benefits of home birth should:

1. Distinguish between planned and unplanned out-of-hospital births.
2. Discriminate between different types of providers.
3. Provide relevant and consistent inclusion criteria for study subjects across comparison groups.
4. Adjust for differences in selection criteria for home birth and perinatal management
5. Control for differences in transfer criteria and method
6. Define terms such as mortality and morbidity
7. Select relevant and consistent outcome measures.\textsuperscript{6}

In addition, Vedam\textsuperscript{6} suggests that analysis of these studies should examine the influence of lack of randomization, small and homogeneous sample sizes, retrospective and incomplete data in birth records or certificates and differences among community standards of care and countries’ policies and protocols. For example, women who chose to give birth at home are generally accepted to be a unique, highly motivated group of women.\textsuperscript{12}

Only a randomized clinical trial could eliminate the selection bias characteristic of observational comparisons. Studies of home childbirth are justifiably limited by the ethical restrictions on proscribing a mother’s and family’s personal freedom.\textsuperscript{6} A study in the Netherlands hypothesizes that choice in childbirth may have an influence on levels of anxiety and apprehension and could influence pregnancy outcomes, suggesting that
results from a randomized control trial would not be generalizable.\textsuperscript{40} Elimination of choice could, in theory, have a negative impact on childbirth.

Research in England assessed the feasibility of a randomized clinical trial comparing home to hospital birth. Out of 500 women presenting for obstetrical care, 71 were considered to be low enough risk to be considered for home birth, and of these only eleven (2.2\% of original sample) agreed to be randomized.\textsuperscript{41} Four of the six women randomized for hospital birth were ‘disappointed’. Those who declined to participate had strong preferences about birth setting.

In order to understand safety and risks of home birth, I have chosen to discuss articles frequently cited in the literature and those conducted in North Carolina and Ireland because these will likely be of importance to policymakers in these regions. This is not an extensive analysis, but will serve to illustrate the level of evidence that is available.

The individual home birth practices of certified nurse midwives and certified professional midwives in the United States are likely to be very different. The variability between practices both within regions and across regions also makes generalizations about safety in home birth difficult. Studies to be described include a meta-analysis, two recent large studies on home births attended by certified nurse-midwives, a study evaluating home births from a wide variety of attendants, a study of home births attended solely by certified professional midwives, and two smaller studies, one from North Carolina and one from the Republic of Ireland.\textsuperscript{3, 5, 9, 16, 42} Please refer to Tables 1a and 1b for details on the individual observational studies.

A meta-analysis of published observational, comparative, original studies investigating mortality related to planned home and planned hospital births was published
In 1994, inclusion criteria for studies used in the pooled analysis were: (1) defined exposure of planned home births regardless of actual place of delivery, (2) comparability of planned home and hospital births or statistical analysis controlling for confounders, (3) comparability between information from outcomes measures in both groups, (4) and intelligible reporting of results. Exclusion criteria included publication in anything other than English or a Scandinavian language, studies from third world countries, or publication prior to 1970.

The author found six hundred and seven papers using a Medline and MIDIRS (a midwifery database) search of which sixty-two were potentially relevant original studies. Six studies were included in the meta-analysis based on the author’s pre-defined criteria. There is a chance that studies excluded from the analysis could have changed the results. However, the inclusion and exclusion criteria for this analysis seem to be appropriate given the limitations of studies conducted on home births. The six studies included were from Australia, the United States, Switzerland, the Netherlands, and England. Home birth attendants included registered and certified midwives, non-nurse midwives, registered nurses, general practitioners or other physicians. Hospital births were attended solely by physicians in the American and Dutch studies. Midwives were involved in the hospital deliveries in the Australian, British and Swiss studies. Perinatal mortality was defined differently across the studies (lower limit of time frame from 20 weeks gestation or 500 g to 28 weeks gestation; upper limit 7 days to 28 days after birth). Heterogeneity between studies was not detectable for any mortality of morbidity outcomes. According to the results of pooled analysis, perinatal mortality was not significantly different in home and
hospital groups (OR=0.87, 95% CI [0.54, 1.41]). No maternal deaths occurred in any of the six included studies.

The results of this meta-analysis are consistent with results of subsequent studies on the safety of home birth. Weaknesses of this meta-analysis include the observational nature of the home birth studies and the large amount of data (51 studies) that had to be excluded. Mothers in the home birth groups may have been at lower risk than those of the hospital group, suggesting that the results could be biased in favor of home birth safety. The numerous unknown differences between both groups and inability to statistically account for these characteristics makes the overall influence of this data on clinical practice small.

Anderson and Murphy, using data collected by survey from certified nurse-midwives in the United States, conducted two large studies. Both studies were descriptive and did not offer a comparison group. The observational studies by Anderson and Murphy provide an insight into management and outcomes of pregnancies in mothers who are seeking home births with a CNM.

The study by Anderson was a retrospective observational study that described 90 CNM home birth practices providing 11,788 planned home births between 1987 and 1991. Data was collected by survey with a response rate of 67%. The overall intrapartum mortality for planned home births reported by this study was 2.0 deaths per 1000 live births. After exclusion of infants born with congenital abnormalities, intrapartum mortality was 0.9 per 1000 live births. There were no maternal deaths. This study was very limited due to its retrospective nature and reliance on surveys. The results may not be applicable to all CNM home birth practices. However, the study did demonstrate that
outcomes were generally good for the cohort of mothers seeking home birth in the care of a CNM and provided a background for further study.

A subsequent study by Murphy⁴, using the same group of certified nurse-midwives identified in the previous study, demonstrated similar outcomes for planned home births in a prospective observational survey. Data collected was collected from CNM home birth practices in 1994-1995 that were willing to participate. The authors suggest that their sample represented about 40% of all CNM home birth practices that were actively attending deliveries during that period. The overall intrapartum mortality in this sample was 2.5 per 1000 live births. No hospital based comparison group was identified for this sample of deliveries. This study contributes encouraging data that CNM home birth practices are able to screen mothers effectively for home birth eligibility and achieve acceptable outcomes.

A recent large North American observational study of planned home births in low risk women used validated data from the records of 502 certified professional midwives.⁹ (Table 1a) A total of 5,418 women who intended to deliver at home at the start of labor were followed prospectively. This study’s results suggested that there was no significant difference in maternal or infant outcomes between the patients enrolled in this study and a comparable population (3,360,868 singleton, vertex births, at 37 weeks or more gestation, in the United States in 2002) as reported by the National Center for Health Statistics (NCHS).⁹ However, the characteristics of the population choosing to deliver at home in this study were demonstrably different than the characteristics of ‘low risk’ women in the national survey. For instance, women enrolled in this study were more likely to be Caucasian and of higher educational level and potentially at lower risk for
complications than women included in the NCHS data. The internal validity between comparison groups is poor given the many differences between self-selected mothers achieving home births as reported by survey and the mothers registered in NCHS data on hospital births. While this study contributes information on safety and benefits of home birth attended by certified professional midwives, it does not provide conclusive evidence in regards to safety.

A large retrospective study by Pang et al\textsuperscript{11} (Table 1a) demonstrated greater infant and maternal risks in a cohort of home births in Washington State during 1989-1996. This study used birth registry information that could not accurately distinguish between truly planned and unplanned out-of-hospital births. The risk status of mothers included in the study was not known.\textsuperscript{6, 11}

A small retrospective study published in 1980 used birth certificate data in North Carolina on mothers who delivered between 1974-1976.\textsuperscript{16} (Table 1b) The midwives delivering births at home during this time were mostly lay midwives (non-nurse midwives legally registered to practice at the time this study was conducted). The only outcome measured was neonatal mortality. In contrast to other home birth studies represented in this analysis, mothers who delivered at home in this study tended to be younger, black, unmarried, and less educated than the average mothers delivering in NC at that time. The authors attempted to determine which of the home births were planned and classified these births accordingly. The overall neonatal mortality of home births regardless of classification was 30 per 1,000 live births. In home births classified as “planned” the neonatal mortality was 6 per 1,000 births. The neonatal mortality for hospital births of infants >2000g during this period was 7 per 1,000 births. Overall
hospital neonatal mortality was 13 per 1,000 births. This study was carefully designed and able to demonstrate the difficulty in determining planning status of home births from retrospective data. The deliveries under the care of lay midwives at this time in North Carolina appears to have been appropriately safe and gives a historical context for home birth in North Carolina as recently as the 1970s. However the data from this study may not be generalizable to current home birth practices in North Carolina.

One small retrospective observational study in Ireland evaluated the risk of perinatal death for infants of mothers who planned home births with an independent community midwife. 42 (Table 1a) The authors draw the conclusion that the risk of perinatal mortality was greatly increased in infants born to mothers who had planned for a home birth with an independent midwife as compared to mothers who planned delivery in a hospital. However, this study, while highly publicized, was methodologically limited. The data on numbers of planned home births was not complete, the time period for comparison of perinatal mortality rates between the two groups was different, no maternal characteristics were analyzed, and no specific criteria to define death by intrapartum asphyxia or hypoxic events was given. This study does not provide clinical evidence of risk for infants with planned deliveries at home, however the implications of its publication on the perceived safety of home birth in Ireland is may be significant.

Lack of Level I or conclusive Level II evidence around safety and risks of planned home childbirth in low risk women makes evaluation of home birth difficult. For the purposes of this analysis, I will conclude that the risks of planned home childbirth, as illustrated by current evidence, cannot be shown to be greater than the risks of planned hospital births in developed countries such as the United States and Ireland. Therefore the
choice of a planned home childbirth is a reasonable one for women who are at low risk of complications and have access to home birth services. Because more evidence is required prior to drawing conclusions regarding the practice of home birth, the decision-making process for low-risk women in areas where a home childbirth attendant is available is one involving providers, mothers and family. These choices are often limited by the availability of providers willing to provide homebirth, community resources, and both social and legal barriers in Ireland and North Carolina.

**Potential Benefits of Planned Home Birth**

In some studies the practice of home birthing under the attendance of a midwife is associated with reduced rates of interventions, enhancement of maternal-infant bonding, psychological benefit, lower rate of perineal lacerations and episiotomy, and higher rates of breast-feeding. \(^6\)\(^{-14}\) Births initiated in a home are also associated with a lower usage of epidurals and cesarean delivery. \(^1\)\(^{,12}\) Advocates of home childbirth emphasize the safety and cost-effectiveness of a home childbirth/midwifery model as an alternative to hospital care in low risk pregnancy. \(^1\)\(^,6\) An association between the population choosing to plan a birth at home and more favorable outcomes such as underlying health, socioeconomic status, education, and self-motivation may confound the connection between home birth and favorable outcomes.

Issues such as the overuse of cesarean delivery and other interventions may be of concern to mothers who are seeking to deliver their infants outside of a medical center. In the previously mentioned large North American study by Johnson\(^9\), the rate of cesarean delivery in low risk mothers who chose to deliver at home with a certified professional
midwife was 3.7%. This rate is significantly lower than the U.S. national cesarean rate of 19.0%, (low risk pregnancies attended by physicians within a hospital) and reflects the ideology of CPM practice with minimal intervention.\textsuperscript{9, 21, 27}

In the Netherlands, national policy promotes home birth as the standard of maternity care in the context of low risk pregnancy. This policy is thought to protect mothers from unnecessary interventions.\textsuperscript{31, 33, 35} Although the rate of cesarean section in the Netherlands has been steadily increasing over the last decade (from 8.1% in 1993 to 13.6% in 2001), the cesarean rate of the Netherlands remains significantly lower than the rate in all other Western European countries.\textsuperscript{43, 44} The separation of primary and secondary obstetrical care, leaving approximately 40% of deliveries in the care of midwives and general practitioners may contribute to the lower intervention rate.\textsuperscript{44}

In the United States and the Republic of Ireland, the rates of cesarean delivery have been rising over the course of the last two decades.\textsuperscript{45, 46} According to the Centers for Disease Control, the overall rate of cesarean birth in the United States jumped to an all time high of 29.1% in 2004.\textsuperscript{45} In 1995 the cesarean rate for the United States was 21%.\textsuperscript{47} In 2002, the overall rate of cesarean in Ireland was comparably high at 22.4%.\textsuperscript{46} This was a 72% rise from Ireland’s cesarean rate in 1993 of 13%.\textsuperscript{46}

In the context of limited evidence, home childbirth appears to be a cost-effective practice.\textsuperscript{1} Pregnancy and childbirth in the United States makes up approximately 20% of health care costs and is the most frequent cause of hospital admission.\textsuperscript{1} A 1999 study found that average uncomplicated delivery costs 68% less in a home than in a hospital.\textsuperscript{1} This difference in cost was based on an analysis of charges to purchasers, including insurers and consumers, in the United States.\textsuperscript{1} Measures of the effectiveness of home
birth were rates of birth without intrapartum, fetal, or neonatal mortality and birth without cesarean delivery. Unfortunately information on morbidity was not included in this analysis. However in the studies of planned home deliveries so far, there has not been an association between home delivery and poor APGAR scores, a relative indicator for short-term morbidity.

Data for this cost-effectiveness analysis was collected from records of certified nurse-midwives that offer home services. The analysis was limited by record keeping of home birth practices and the sample was incomplete, however the discrepancy in cost between home birth and hospital birth were large enough that it is appropriate to conclude that maternity care of a certified nurse-midwife, and home birthing, is a more cost-effective practice than hospital delivery, if safety from short and long term morbidity can be assumed.

**Background**

**Ireland and the Irish Health Care System**

The population of the Republic of Ireland in 2006 was 4.2 million. Ireland’s population is relatively homogeneous compared with the United States, but is beginning to change due to a high rate of immigration. For instance, the share of foreign-born people living in Ireland rose from 6% in 1991 to over 10% in 2002.

In 2002, the infant mortality rate (death within first year of life) and perinatal mortality rate (stillbirths and deaths within first week of life) in Ireland was 5.5 and 7.6 deaths per 1000 live births respectively. Limited evidence on disparities in reproductive outcomes include a study that demonstrated a significantly higher incidence
of perinatal mortality and low birth weight infants in families of lower socioeconomic status in the 1990s. The Irish health care system is a mixed system of funding and delivery of services. Funding for health care in Ireland is primarily tax-based. In the last decade the system has undergone reform, largely influenced by sharp health care expenditure increases that began around 1996. Three core programs are funded to serve the Irish population’s health needs: general hospitals, special hospitals, and community care programs. The majority of General Practitioners, Hospital Consultants (in the United States ‘Consultants’ would be referred to as ‘Specialists’), and pharmacists provide services for both public and private patients.

In 1992 a social assistance model was developed in the Republic of Ireland and has been maintained. Currently, there are two categories of health care assistance. The category of parents generally determines the category of children in the family, with exception in the case of chronic illness or disability.

<table>
<thead>
<tr>
<th>Category I:</th>
<th>Originally, this category included the poorest one third of the population. Category I patients are eligible for a medical card which entitles them to all health services free. In addition, since 2001 all persons over 70 years of age are eligible for a medical card regardless of means.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category II:</td>
<td>The remainder of the population has a limited eligibility for a range of health services. In Category II (non-medical card holders) patients are required to pay out-of-pocket for General Practitioner (GP) services and medications up to a maximum of €85 per month. Category II patients qualify for care in public hospital beds at a small expense per day up to a set number of days in a given year. Additional days do not incur charges. Outpatient hospital services are available with referral from GP.</td>
</tr>
</tbody>
</table>

**The means cut-off for financial eligibility, however, has not kept up with rising incomes in Ireland. The proportion of the population currently covered by the medical card is lower than a third.**

Over 45% of the Irish population purchases private health insurance. Currently, about 40% carry private insurance from a non-profit organization run by the Irish
Government called the Voluntary Health Insurance (VHI) board. An additional 4-5% of the population carries other private insurance. The availability of other private insurance is a recent development that began after the Health Insurance Act of 1994 opened up private insurance in Ireland to the free market. Generally patients with private insurance are perceived to receive care more promptly and experience better outcomes than those without. All health insurance premiums and out of pocket, unreimbursed, expenses are tax deductible.

Prior to 2004, local health policy and decision-making rested with several regional Health boards, however, in the Health Act of 2004 the boards were abolished and a Health Services Executive was established to manage budgetary and executive responsibilities for the entire country. Health policy decision-making is the responsibility of the Department of Health and Children (established in 1997) and decisions regarding health legislation rest with the Irish Government.

All expectant mothers who are residents in the Republic of Ireland are entitled to free maternity care covering antenatal, labor, delivery and postnatal care. Quality and accessibility of maternity care can vary based on insurance status (public, semi-private and private). A general practitioner or midwife generally provides antenatal care and delivery. The majority (~99%) of deliveries take place in a hospital setting.

*Changes in Birth Setting, Ireland*

The history of maternity care, and transformation to a largely medical, hospital-based system in the present-day Republic of Ireland has followed that of Great Britain and reflected British policy. (The Republic of Ireland achieved political independence in
1922.) Lying-in hospitals were developed with the charitable intention of providing a place for the very poor or abandoned to give birth.\textsuperscript{14} In 1745 the Rotunda Lying-In Hospital was built, however the majority of people, rich and poor, were cared for in their homes through the 19\textsuperscript{th} century.

In 1925, in Ireland, puerperal fever was responsible for half of deaths of women in childbirth. Around this time, through the 1920s and 1930s, maternal death rates in Dublin suggested that it was safer to deliver at home compared with a maternity hospital.\textsuperscript{14} With the advent of aseptic technique and antibiotics, the risk of maternal and infant mortality was greatly reduced. Rates of maternal mortality were significantly improved in Ireland by around 1938.

In 1956, the percentage of Irish births were recorded as delivered at home was 31\%.\textsuperscript{14} Ten years later, the percentage of births in Ireland that took place in the home had dropped to less than 10\%. After World War II, the number of home deliveries continued to decrease to its lowest proportion of less than 0.5\% (1976).\textsuperscript{14} This precipitous decline was associated with a number of key factors. In 1954 the government introduced a program providing community-based maternity services free of charge.\textsuperscript{14} Mothers who would have chosen to deliver at home for financial purposes acquired the option of hospital birth. In addition, social and cultural forces made hospital delivery fashionable. As maternity hospitals grew, maternity units in general hospitals and small nursing homes and cottage hospitals closed.\textsuperscript{14} Irish maternity policy evolved to a dominant obstetrician-led medical model of care. By 1978, ninety-one percent of all births in Ireland were taking place in units managed by obstetricians.
**Home Birth Services in the Republic of Ireland**

The Women’s Health Council (WHC) is a statutory body set up in 1997 to advise the Minister for Health and Children in regards to the development of health policy to ensure the maximum health and social gain for women in Ireland. According to a 2004 publication by the WHC, the law pertaining to home birth services in Ireland is contentious.¹⁵ Historically there were applications to the High Court and Supreme Court in Ireland in relation to the perceived obligation of a Health Board to offer home birth services. At the time of publication, financial coverage for employment of an independent community midwife was only available in Health Board areas that observed the availability of home birth services as a legal right (for example, the North Eastern Health Board and the Mid-Western Health Board).¹⁵

In Section 62 of the Health Act 1970, health boards are required to make available appropriate medical, surgical and midwifery services. A National Expert Group on Domiciliary Births was established in 1997 for the purpose of advising the Health Service Executive in regards to home birthing. The Domiciliary Birth Group suggested piloting three home birth schemes. This resulted in the funding of three Community Midwifery Pilot projects by the Department of Health and Children in 1998: (1) Community Midwifery Pilot Project Service within the Southern Health Board (SHB), (2) Multidisciplinary Home Birth Pilot Project in the Western Health Board (WHB), and (3) Domino and Hospital Outreach Home Birth Service based in the National Maternity Hospital at Holles Street in Dublin.¹⁵

In 2003 the Supreme Court in Ireland unanimously ruled that there was no statutory obligation for a health board to provide home birth services. The Supreme Court
ruled that those services are sufficient if available in the confines of a hospital. Nonetheless the newly formed Health Service Executive (HSE) (formerly the Health Boards) is currently trying to provide home birth services to Irish residents who request services. According to a publication by the HSE, the health care system is having difficulty providing these services because of the shortage of experienced and willing home birth practitioners. Some areas of the HSE that are unable to provide home birth provide a home birth grant towards covering the cost of a private midwife. HSE provided home birth services appear to include free antenatal, delivery and postnatal services in addition to a basic ‘maternity pack’ including materials required for home delivery. In practice, fees for services and equipment of independent domiciliary midwives may only be partially covered. It is estimated that independent midwives charge €1400-2400 ($1,940-$3,264). The health boards are expected to pay financial assistance of about €1200. Private insurance, including VHI, give grants of €900 ($1,224) towards home births. The cost of care for mothers who participate in pilot programs with affiliated medical centers is covered. Additional financial resources may be necessary for mothers who wish to pay for a home birth with an independent midwife.

Despite financial coverage of home birth services, access to a midwife willing to provide a home birth, particularly in less populated regions of Ireland is limited. Currently there are 14 practicing independent midwives in Ireland. The absence of honorary contracts between independent midwives and maternity hospitals leads to a their limited ability to communicate with, take part in or attend births that need to be transferred to a hospital.
**Background on North Carolina (United States)**

The population of North Carolina in 2004-2005 was about 8.4 million. The infant mortality rate for North Carolina in 2002 was 8.2 deaths per 1000 live births.\(^{57}\) In contrast to the health care system in Ireland, the United States does not have a system of universal coverage for the population, and not all women who become pregnant are covered by insurance.\(^{58, 59}\)

Under Medicaid, states are required to cover pregnancy-related care for pregnant women with incomes up to 133% of the federal poverty level (approximately $22,000 for a family of three) for up to 60 days postpartum.\(^{60}\) State funds allocated to Medicaid are matched by federal funds. Medicaid is one of the largest payers of maternity-related services and financed more than 40% of all deliveries in the United States in 2005.\(^{60, 61}\) Sources of financing other than Medicaid for maternity-related services include employer paid health coverage, HMOs, privately purchased health insurance, and personal income.\(^{58, 59}\) In North Carolina, Medicaid for pregnant women is extended to those below 185% of the federal poverty line (approximately $29,000 for a family of 3 in 2006); coverage includes prenatal, intrapartum and postpartum care.\(^{62}\) Between 40-50% of deliveries in NC are paid for by Medicaid.\(^{60}\) In contrast to the universal coverage system in Ireland, the North Carolina Pregnancy Risk Assessment Reporting System (PRAMS) recorded that only about 60% of mothers had health insurance prior to pregnancy in 2002-2004.\(^{58}\)
Changes in Birth Setting, North Carolina

In the United States, the progression of maternity care to a hospital setting was similar to that experienced by Ireland. By mid-1800 the beginnings of a movement from home birth setting to hospital setting were formed as a few “lying-in” hospitals and maternity beds were established in the United States for the very poor or ‘abandoned’. In the 1920’s, in areas with low population density, it was not uncommon to find that the only birth-attendant within fifty miles was a neighbor with a small amount of self-taught midwifery skills. The majority of deliveries in the early 1900’s were conducted at home and attended by a physician. In immigrant communities, childbirth customs reflected those imported from Europe and physicians were summoned only for dire emergencies. Around the 1940’s, while there was still a great deal of rural midwifery, hospital delivery became fashionable, and physicians in hospitals delivered the majority of affluent, white women’s pregnancies. Women who were poor and/or African-American were largely receiving care from midwives and continued to deliver at home.

Both the United States and the developed countries in Western Europe achieved significant improvements in maternal and infant outcomes in the last century, while the transition from home to hospital birth was underway. In North Carolina, there was an association between the shift from home to hospital births and significant improvements in North Carolina’s maternal and neonatal mortality. In 1940, 76% of North Carolina’s infants were born at home. By 1975, less than 1% were home births. The maternal mortality rate in the state declined from 50 deaths per 1,000 live births in 1940 to 0.3 deaths per 1,000 live births in 1975. (North Carolina’s maternal mortality ratio in 1999 was 13.2 per 100,000 live births or 0.132 per 1,000 live births.) The neonatal mortality
rate declined from 33 deaths per 1,000 live births in 1940 to 13 deaths per 1,000 live births in 1975.\textsuperscript{16} (North Carolina’s neonatal mortality rate in 2004 was 6.0/1000 live births.\textsuperscript{65}) This rapid improvement and its association with the shift to hospital deliveries, could have provided great support for hospitalization of birth.\textsuperscript{63}

**Home Birth Services in North Carolina**

Through the 1970’s lay midwives (midwives who were not CNMs) legally attended home deliveries in some counties of North Carolina, and their practices were regulated by the county health departments.\textsuperscript{16} Health departments provided prenatal care and approved low risk pregnancies for home delivery. Lay midwives providing home births in North Carolina continued to be given initial certifications to practice up until 1964, after which lay midwives were gradually phased out.\textsuperscript{16}

According to the law, in North Carolina a woman is legally permitted to give birth to her infant wherever she wishes, including home, and choose whoever she wants to be with her during birth.\textsuperscript{66} While in theory the freedom to choose persists, a mother is limited by access to a safe coordinated system of home birth care. A Certified Nurse-Midwife (CNM) is permitted to practice homebirth but must work in conjunction with a doctor.\textsuperscript{66} There is no licensure in North Carolina for the group of attendants most interested in providing home births, certified professional midwives (CPM), and they are prohibited from practicing midwifery in North Carolina.\textsuperscript{66}

The American College of Obstetricians and Gynecologists (ACOG) states that it “does not support programs or individuals that advocate for or who provide out-of-hospital births”.\textsuperscript{67} While acknowledging an expectant mother’s freedom to choose,
ACOG believes that the hospital (including a birthing center within a hospital complex) is the safest setting for labor delivery and the immediate postpartum period. According to the ACOG Statement of Policy: “Ongoing surveillance of the mother and fetus is essential because serious intrapartum complications may arise with little or no warning, even in low risk pregnancies. In some of these instances, the availability of expertise and interventions on an urgent or emergent basis may be life-saving for the mother, the fetus or the newborn and may reduce the likelihood of an adverse outcome.”

In North Carolina, certified nurse-midwives receive reimbursement by Medicaid for maternity care services. This would include the basic professional fee for delivery of an infant in the home. Most other insurance providers provide similar coverage. However, a CNM that practices home birthing may need to charge a fee of about $1000.00 over the hospital-based professional fee. This would cover, for example, additional supplies and equipment that a provider must bring with them to the home for a safe delivery that cannot be billed. Currently there are 2-3 private home birth practices, managed by certified nurse-midwives, in North Carolina.

Discussion

Comparing Ireland and North Carolina

The United States and the Republic of Ireland are both countries with well developed but changing health care structures. Ireland’s health care system recently underwent reform with the goal of creating a more centralized system, however according to a key informant in the Irish health care system, the transition from the health board infrastructure is still underway. This suggests that the HSE has not yet fulfilled its
goals of reorganization of funding, centralization of decision-making, and achievement of quality assurance goals. These features, and the mix of both public and private practice in Ireland, causes variability in services that may make it more comparable to the health care structure in North Carolina. However, the relative centralization of health care in Ireland suggests that maternal health decision and policy-making is more homogeneously enacted in the various health centers across the country in comparison to the United States.

The difference between care received by medical cardholders, public and private patients in Ireland may leave certain populations more or less vulnerable to different quality levels of care. Theoretically, under the socialized model of health care coverage in Ireland, uniform access should be available for the entire population. This is not the case. For instance, waiting lists are a common problem in Ireland. How waiting lists and differing quality levels of care influence obstetrical care choices in Ireland’s rapidly changing health care service varies between different population groups and is difficult to define.

The practices of midwives providing home births both in North Carolina and Ireland appear to vary. In North Carolina there are a few licensed certified nurse-midwives who have established home birth services. According to a hospital-based CNM in North Carolina, generally CNMs are not interested in providing home births. Because of this, there are unlicensed midwives, with a wide variety of qualifications, attending mothers who want to give birth at home but may not have access to a CNM practice. Similarly, in Ireland, very few hospital nurse-midwives attend home births. Other than midwives involved in maternity hospital pilot programs, only independent community
midwives, of which there are currently fourteen, conduct home births. Most independent community midwives, however, lack the coordination with medical centers that the hospital-linked home birth projects provide.

Ireland’s pilot home birth programs reflect the small but significant market for home birth care among Irish mothers. Data on the effectiveness, safety, and benefits of these projects is still forthcoming. The development of these projects, in conjunction with various maternity hospitals across Ireland, may have been facilitated by the social structure of Ireland’s health services and collective efforts by the country’s government to provide more birth choices. Evidence for this support is seen in the HSE’s intention to cover the cost of a home birth via public and private insurance. Issues of insurance coverage in these projects could have been less difficult to facilitate than they would have been in North Carolina, as the majority of residents in Ireland receive health care by public means or by the government subsidized not-for-profit private insurance.

Policy Options

In order to improve understanding of how policy changes would influence the safety of mothers seeking home births in North Carolina, three options will be discussed, in comparison to maintaining the status quo, in the following sections. These options are (A) to institute a requirement that no out-of-hospital deliveries occur, (B) to promote an increase in the number of certified nurse-midwives in North Carolina, and (C) to promote legalization and therefore regulation of certified professional midwives in North Carolina.
A. Institute a requirement that no out-of-hospital births occur.

In North Carolina, the group of mothers with an interest in home birth is assumed to be very small. Mothers choosing a home birth are attempting a delivery outside of the dominant social and cultural context of their health communities and they represent a unique group. Some stakeholders may feel that although this unique group has desires, home birth plays no role in safe maternity care provision. This may be particularly true from the standpoint of professionals providing care to high-risk mothers who are exposed to rare outcomes such as maternal and intrapartum mortality more frequently than primary providers of low risk care. Although prohibiting freedom of choice would not be acceptable to mothers in the United States it is important to understand the strengths and weaknesses of this proposal.

From a hospital standpoint, resources are in place structurally to provide beds for all mothers. Maternity care providers in the United States may see the merit in the assurance that mothers are within the controlled confines of a hospital during labor with an operating room nearby. However, from a public health standpoint, the hospitalization of all births is not a cost-effective policy. An analysis by Anderson \(^1\) found that the average uncomplicated delivery costs 68% less in a home than in a hospital. In general, maternity care provision by certified nurse-midwives cost significantly less than obstetricians.\(^6\)

Hospital birth is the standard of care in the United States, supporting 99% of deliveries at this time.\(^1\) While it may be the norm to give birth in a hospital, enforcement of a policy that prevents mothers from giving birth at home would produce unacceptable stress on mothers who desire such a choice. This option would greatly limit access to
home birth services and further marginalize out-of-hospital birth providers. If value is invested in a mother’s right to choose where she wishes to deliver her child, holding open the option of home birth is a necessary policy.

Under current practices, mothers retain the right to choose a birth setting outside of a hospital. From the perspective of an informant who has undergone a home birth in North Carolina, the process of finding a provider, seeking antenatal care and organizing back-up care is very difficult at this time. However, from her perspective, she felt that every minute of the extra work required to facilitate the delivery of her child at home was worth it in comparison to her previous hospital delivery.

There is no conclusive evidence that a delivery at home in the context of low risk pregnancy is unsafe in comparison with delivery in a hospital. For this reason, out-of-hospital birthing continues to be supported by the American Public Health Association. Additionally, there are families in North Carolina for whom a home birth has been a safe and rewarding experience. Based on data available at this time, Option A, to require that no out-of-hospital births occur, is not a publicly feasible, evidence-based or cost-effective option in comparison to current practices.

**B. Increasing the number of certified nurse-midwives (CNM)**

Placing the care of low risk mothers in the hands of certified nurse-midwives is considered to be safe. According to evidence available at this time, a certified nurse-midwife home birth practice can offer a mother careful screening, prompt and appropriate referral to specialist services in the case of complications, and a satisfying home
Certified nurse-midwives are in the minority as providers of maternity care in North Carolina although the number of deliveries they attend each year is growing.\textsuperscript{70}

Pregnancy related care under the management of certified nurse-midwives, although not widespread at this time, would likely be acceptable to most mothers. For example, satisfaction with maternity care was equal or better (particularly satisfaction with antenatal care) when compared to physician-managed care in a randomized study.\textsuperscript{71} Some of the benefits associated with home birth that mothers are seeking, such as low rates of intervention and control over environment, may be a reflection of the philosophy and training of certified nurse-midwives rather than a characteristic of the home birth setting. In a study comparing practices of different maternity care providers, patients of certified nurse-midwives were less likely to be continuously electronically monitored during labor or to receive oxytocin for induction or augmentation of labor.\textsuperscript{72} Additionally, low rates of cesarean delivery are associated with out-of-hospital birth centers.\textsuperscript{73}

Promoting the leadership of certified nurse-midwives in low risk pregnancy and support for out-of-hospital birth centers would be one way to offer mothers a choice that would promote a more natural childbirth experience with less intervention. This could, in theory, decrease the demand for home birth services, while making comprehensive low risk pregnancy preventive care more available.

The development of more out-of-hospital birth centers that promote a physiologic approach to management of low risk pregnancy could fulfill the needs of some mothers seeking home births in North Carolina. However, there may be other features of home birth that cannot be duplicated in any other setting. According to a Dutch qualitative study using the perspective of mothers, advantages of home birth included control of their
environment, being surrounded by loved ones and the close interaction with a trusted midwife attendant.\textsuperscript{34} Advocates of home birth also stress the theoretical safety of an environment such as the home which contains pathogens known to a mother’s immune system as opposed to that of hospitals which may harbor drug-resistant infectious diseases.\textsuperscript{74} Other reasons for choosing a home birth over a birth center or a hospital could include religious and cultural beliefs, financial choices, or an unfavorable prior experience with hospital birth.\textsuperscript{11,16} An informant who had personally experienced a home delivery suggested the feeling of safety and of control in her birth experience were incredibly meaningful benefits to her.

It would be structurally feasible to increase the state’s supply of certified nurse-midwives. Provision of maternity care services by certified nurse-midwives would be cost effective.\textsuperscript{1,68} However, although feasible, it can be assumed that a great deal of reform would need to be undertaken to create a better practice environment for CNMs. While an analysis of the necessary steps to change policy and practices in North Carolina at this time are beyond the scope of this paper, there are proponents who suggest areas in which to begin. According to one author, there appears a relationship between a state’s practice environments and the supply of certified nurse-midwives in that state.\textsuperscript{75} Dr. Thomas Strong\textsuperscript{17}, an experienced high risk maternity specialist and author of an extensive analysis of the United States’ maternity care system, states that “nurse midwives should have the same autonomy that obstetricians have to advise and care for mothers during low risk pregnancies; restrictive regulations should be modified, limited prescriptive authority should be permitted, and greater acceptance as medical professionals by the obstetric establishment should be fostered”.

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Strong suggests that changing the paradigm of maternity care in the United States by moving the primary care of low risk mothers into the hands of certified nurse-midwives while using the skills of obstetricians and high risk maternity specialists to care for women with additional needs would beneficially impact reproductive outcomes overall in the United States. There are currently several groups that are activists with a public health goal of improving the practice environment for CNMs. More information is available through resources including the Public Citizen’s Health Research Group and North Carolina Physicians for Midwives.

On the other side of the coin, there are several limitations to a policy that expands the provision of maternity care by certified nurse-midwives. An increase in the numbers of certified nurse-midwives through revision of the practice environment in North Carolina may be opposed by competing maternity care providers. Lack of support from the American College of Obstetricians and Gynecologists (ACOG), for out-of-hospital birth would continue to hinder development of strong communication networks between nurse-midwives practicing outside of hospital systems and back-up medical emergency care providers.

From the perspective of a hospital-employed nurse-midwife informant, many nurse-midwives are not interested in providing home births. Increasing their numbers may not increase the home birthing services available to mothers in this state. However, the overall health of mother and children in North Carolina would benefit from increased access to good preventive maternity care including early detection of problems and risk factors, steady emotional support and encouragement. Certified nurse-midwives are ideally trained providers for this level of care in low risk mothers.
In summary, increasing the availability of certified nurse-midwives for the care of low risk women would be generally acceptable to both mothers and maternity care providers, would be moderately feasible from a structural standpoint, and cost-effective. Unfortunately, it is uncertain whether increasing the number of CNMs would improve the availability of home birth services. Overall, efforts to expand the numbers of CNMs in North Carolina could be beneficial to the health of mothers and children.

C. Legalization and regulation of certified professional midwives (CPM)

In order to make informed policy and legislative decisions with the goal of protecting mothers seeking home births, information about how to provide these mothers with good quality home birth care, including careful risk selection and protection from avoidable morbidity and mortality, will be needed. There is no conclusive evidence that care under certified professional midwives, who are variably supported throughout the United States, puts mothers at risk. The American Public Health Association (APHA) states that it “recognizes that legally regulated and nationally certified professional midwives can serve mothers desiring safe, planned, out-of-hospital maternity care services and supports efforts to increase access to out-of-hospital maternity care services.”

Certified professional midwives have a strong commitment to providing home birth services. Their inclusion into North Carolina’s system of maternity care would open up the option of a home birth to more women. CPM services are associated with low intervention rates, high maternal satisfaction, and cost-effectiveness. The regulation of home birth services by CPMs in North Carolina could improve overall safety,
satisfaction and quality assurance of home deliveries. If mothers have a method of checking the certification of qualified midwives, certified professional midwives and certified nurse-midwives, then it is less likely that they will receive suboptimal care and potentially be exposed to greater risk of poor outcomes. Mothers seeking a home birth could be openly educated in regards to the merits and potential drawbacks of various types of home birth providers. Providers of home birth in North Carolina could coordinate care with hospital systems, openly collaborate to collect data, and monitor quality of services.

However, the acceptability of including certified professional midwives into the maternity care system from the perspective of professional providers in North Carolina at this time is very low. There would be strong opposition from obstetricians and many nurse-midwives who would be in direct competition for low risk maternity care provision. Although the practices of certified professional midwives have not been shown to be unsafe, much stronger evidence of their safety and benefits would be required to change the paradigm of maternity care in North Carolina. Structurally, malpractice and insurance reimbursement issues would have to be developed. Coordination between medical centers and certified professional midwives would be even more difficult to arrange than it is for certified nurse-midwives in private practice at this time.

Despite support from the APHA, legalization and standardization of certified professional midwives in North Carolina will be difficult to achieve. Without strong support from the medical community, it would not be possible to enact the structural changes necessary to incorporate them into North Carolina’s system of care. Because current North Carolina policy leaves no option for licensing of certified professional
midwives, they are left without any formal coordination with medical systems. It is possible that policies inhibiting licensure of CPMs in North Carolina are leaving certain pregnancies at greater risk for preventable morbidity or mortality because of the inability to organize prompt referral of care. Option C, the legalization and certification of certified professional midwives in North Carolina, may not be a feasible option to enact at this time, however it certainly merits continued consideration.

Conclusion

Information is needed about the number of home births that are occurring in North Carolina, who is attending them, the outcomes of these births, and what features of home birthing mothers seek. Anecdotally, there appears to be a great demand for home birth services in the state. However, without knowledge about pregnancies in North Carolina that are delivered at home, it is impossible to know if anything is needed to improve the safety of home deliveries. Limited access to home birth services may be influencing utilization and safety of home birth.

There are various ways policymakers and providers of women’s health care in North Carolina could address access to safe home birth services for mothers who are planning a home delivery. Of the three options to improve access to safe home birth services discussed in this paper, the most feasible and cost-effective option at this time may be to promote an increase in the number of certified nurse-midwives (Option B). Removing the option to have a home birth completely (Option A) would not be an evidence-based or publicly acceptable policy.
While the evidence is still accumulating on the safety and benefits of home deliveries by certified professional midwives, the strong opposition to non-medically trained providers in maternity care would make the passage of laws or regulations allowing them to practice in this state very difficult (Option C). In contrast, promoting the practice of certified nurse-midwives in North Carolina by increasing their autonomy and enhancing the practice environment of this state is a viable option. Increasing the number and practice environment of CNMs, along with effective coordination with nearby medical centers, would be a more plausible initial step. The philosophy and training that contribute to the safe and satisfying birthing experience of mothers who deliver under the care of a CNM could in turn reduce the demand for home births by offering them an alternative to traditional hospital delivery.

**Future Research**

A policy promoting the management of low risk pregnancy by certified nurse-midwives and potentially increased access to home birth services could be beneficial to the state of North Carolina. I would propose to intersecting research agendas, with the goals of gathering more information about interest in home birth in North Carolina and the safety of mothers and infants who undertake a home delivery. The first would be a survey, similar to the Listening To Mothers Survey from Childbirth Connection, on a sample of mothers giving birth within our state. Data on the desires of mothers seeking maternity care in North Carolina is necessary in order to direct the provision of services. For instance, if the interest of mothers to have a birth at home or outside of the hospital in
North Carolina is lower than recorded in surveys from other parts of the country, resources could be directed elsewhere.

If a significant interest in home birth services were established, I would propose a second research agenda: Development of a home birth service at an academic center, to be led by a team of certified nurse-midwives in collaboration with back-up physician services. This idea is similar to what has been developed and implemented in various maternity centers across Ireland. The benefits in North Carolina would be an expansion of home birth services, prospective collection of data on safety and benefits and the education of students interested in providing these services. The characteristics and risk profile of mothers interested in home births could also be evaluated further. Increasing awareness of the need for alternative birth practices in North Carolina would help policymakers and maternity care providers make decisions that will promote the safety of mothers seeking out-of-hospital maternity care.

**Reflections**

The goal of this paper was to gain an understanding of the health care systems in two different regions, North Carolina and the Republic of Ireland, and how the practice of home birth fit in to each system. Prior to the start of my medical training I had little understanding of the history, foundation, or administration of health care systems. Therefore, as an adjunct to my medical education, it was particularly important for me to study the health care structure of Ireland and the United States. I chose to focus on the role of home birthing in these systems. Prior to my in-depth investigation of these two subjects I had many preconceptions of what I would discover. I would like to take the
time now to reflect on these and the discoveries that I made in the process of writing this paper.

Ireland has a significantly better infant mortality rate compared with North Carolina. In combination with a more homogeneous population, I expected Ireland’s social health care system to be achieving better progress in reducing disparities in health outcomes. However, through my research I discovered that Ireland’s administrative structure for organization and allocation of limited health care resources is still developing. Decision-making processes appear to be decentralized. In addition, maternity care, quality of facilities, and waiting times are variable. Availability is based on public versus private insurance status. Significant health care disparities remain in the Irish population. This may suggest that while Ireland has made it possible for each resident to receive health care services, a laudable accomplishment, the quality of care and influence of outside social and economic forces may limit national health care coverage’s ability to decrease health care disparities.

Prior to my study of the Irish maternity care system I was under the impression that midwives are the leaders in low risk maternity care in Ireland. This was based on the knowledge that a large proportion of low risk deliveries are attended by midwives. It appears, however, that Ireland is unique to most of Europe and that obstetricians are actually leaders in decision making in regards to the management of low risk pregnancy. From the perspectives of Irish key informants, Ireland also suffers from much the same malpractice concerns as the United States.

My focus on home birthing in this paper was based on concerns I had heard voiced by female acquaintances, friends and family about the increasing use of
interventions in childbirth. My interest was compounded by my personal lack of knowledge about how our culture transitioned from home to hospital birthing and what influence this transition has had on the health of mothers and infants in our society.

Initially, I expected home birth, for women of low risk in North Carolina, to be the answer to many of the concerns I was hearing voiced. For instance, in studies of home birth the intervention rate, cost, and incidence rate of poor outcomes were low. In the media, mothers seem to be very satisfied with the deliveries that occur at home. I believed that if North Carolina adopted a policy promoting home birth, it was possible that low risk mothers would benefit overall.

After a more careful analysis of the evidence on safety of home birth in comparison to hospital delivery, I realized that there is too much that we just do not know. From what data that has been published, there is no way to finally determine whether or not home birth is safe in comparison to hospital birth. I also came to grapple personally with the concept that potentially preventable tragedies, such as an unexpected complication in a child or mother, could be occurring in home births. Therefore, a persistent question remains: Is it worth the risk to investigate an alternative to the status quo?

One of my most alarming discoveries in this research was the realization that there are invisible providers delivering infants at home in North Carolina. Mothers seeking home birth services often find a way to achieve their goal, but find their options limited. These deliveries may, on occasion, be less safe than deliveries that are coordinated with a medical care system. The market for home birth in North Carolina seems to be in part fulfilled by non-medically trained, maternity care providers who could
be certified and practice legally in other regions of the United States. In the literature certified professional midwives have demonstrated good outcomes in low risk pregnancy. From the perspective of the home birth community, these providers are very much respected and accepted. I believe that promoting education and perhaps coordination of the medical community with the practices of these providers would be beneficial.

It appears that in both the medical and non-medical community alternative birthing practices are marginalized. Mothers who have made the decision to move forward with a home birth run into significant resistance when trying to find a maternity care provider to back up their decision. While the benefits and risks of a home birth are not commonly known by mainstream providers, I find it interesting that women seeking prenatal care and a source of back-up, should the need arrive, may be denied care based on their choice. This phenomenon is in direct opposition with the ideal that women should be allowed the right to choose where to give birth. It is clear that while we offer a woman the right to make this choice, the maternity care system in North Carolina does not support each woman’s ability to do so safely.

I have discovered that while structural alterations to improve maternal and child health indicators, such as decreasing the number of interventions in childbirth, may be indicated and supported, the feasibility of achieving these changes is very low in the maternity care systems of North Carolina and of Ireland. Maternal care in western culture is tightly wrapped in a web that includes moral and ethical values, evidence- and non-evidence-based practices, historical precedents and economic and political forces. The desires of mothers and families have been resurfacing in the picture and will likely continue to be an important factor. In the context of home birth, these forces appear to be
in conflict. I find these interconnections intriguing, and will continue to explore them throughout my career.
References


43. European Health For All Database [database online]. World Health Organization; Updated June 2007.


