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Birthing Center Concept; A Review of Eight Years' Experience in a Rural Birth Center.

David Barr Gorchoff

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THE BIRTHING CENTER CONCEPT:
A REVIEW OF EIGHT YEARS' EXPERIENCE
IN A RURAL BIRTH CENTER

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THE BIRTHING CENTER CONCEPT:  
A REVIEW OF EIGHT YEARS' EXPERIENCE  
IN A RURAL BIRTH CENTER  

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1987
PREFACE

This paper gives me a chance to tie together strands from many aspects of my life, past, present, and future. My interest in alternative obstetrical care began nearly ten years ago, with my wife, Catherine's, first pregnancy and the birth of our daughter, Sara. We were living in Santa Cruz, California then, and were exposed to the wide diversity of opinions and controversies surrounding birth in that time and place.

We've since had our second daughter, Amy. Catherine is set to graduate as a Certified Nurse-Midwife, and I am a Family Practice physician, and just completing my requirements for my M.P.H. degree. I continue to be deeply interested in obstetrics, and thus was quite excited last summer when I was offered a position as National Health Service physician at Happy Camp Health Services in Happy Camp, California. My family and I are ready to return to California after a four-year East Coast stint, and Happy Camp is especially appealing to us because of its birthing program.

The clinic in Happy Camp follows a model commonly seen elsewhere in the world, but rarely seen in the United States. It is truly a primary care center, the hub of medical care for a huge, sparsely populated area just below the Oregon border in northern California founded and still overseen by a board of community members. Services include a full laboratory, pharmacy, x-rays, and family practice including pediatrics, internal medicine, outpatient surgery, gynecology, and emergency care as well as the birthing program which encompasses prenatal care and classes, delivery of low-risk
patients, and postpartum care.

I was struggling with potential thesis topics early last winter when Dr. Frank Sweeney (the present Happy Camp physician who I'll be joining in July) mentioned to me his interest in having the birthing center statistics analyzed, possibly for eventual publication. Without hesitation I volunteered, and herein are the results.

Any scientific approach to data analysis relies upon some sort of control group or reference population with which one can compare his or her data. In the case of Happy Camp, there was no obvious comparison group. Although quite similar in structure to institutions overseas, differences in the surrounding cultures and health care systems would make comparisons difficult. I therefore chose to examine the Freestanding Birth Center movement here in the U.S. as my standard of comparison. The advantages of this choice were many. There is a fairly extensive literature on Birth Centers, especially in regard to outcome, which was useful for evaluating outcomes in Happy Camp. All these centers share our American health care system (for better and for worse) and, with local variations, our American cultural milieu. As will be seen, however, there are limits to this choice of reference group as well. A majority of birthing centers are in urban or suburban areas, and few are part of a larger primary health care center as is Happy Camp's. Given these limitations, I feel the comparison is a workable one, and hope the reader will agree.

My goal in compiling these statistics was to demonstrate that safe, humanistic obstetrical care can be delivered in a local rural setting with the support and back-up of the larger technological
medical system. I think that sometimes we health care providers forget the value of human contact and the support of one's own community in promoting good health, and I hope that this paper can serve as a reminder of this simple fact.

I am also interested in the effects of the larger medical system and its predominant views on local health practices, or what I consider to be the politics of health care. Despite claims to the contrary, much of the standard of medical care in this country is more a result of such politics than of science. The effects of these political forces will also be a recurring theme throughout this thesis.
Grateful thanks to all the staff, physicians, and patients of the Happy Camp Health Services for their strength and wisdom in creating and supporting the birthing program.

Invaluable assistance with research as well as instruction in the use of the IBM computer for word processing was provided by Evelyn Breck, head librarian at the Middlesex Memorial Hospital Health Sciences Library, Middletown CT.

Data processing was supported by funds from the Department of Community Medicine, Program in Public Health, University of Connecticut Health Center, Farmington CT.

As always, my greatest debt is owed my family, and especially my wife (and near-CNM) Catherine. My strong interest in birthing is rooted in our shared experiences of the pregnancies and births of our two wonderful daughters, Sara and Amy. Their love, support, and sacrifices have been noted and appreciated more than I can say.
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INTRODUCTION

Should babies be born at home? What a question! Where else should they be born if not in the home? The hospital? But I had thought that a hospital was a place where one went for relief from sickness or injury. I would not have thought, had I not known it to be a fact, that the most important event in the life of a family, the birth of a child, was best celebrated away from the home, away from the family, in a hospital—in a hospital to which the sick and injured go. Is pregnancy a sickness? Is the birth of a child a disease? Is the arrival of the baby something the rest of the family should not share? Is it bad for the mother, or for anyone else, if the birth takes place in the home? ...One can readily understand and sympathize with the physician’s desire to have his patients in the hospital for the deliveries of their babies—it is a great convenience for the doctor, but is it good for anyone else? Is it, eventually, good for the doctor himself? Is it good for the baby, for mother, for society? The answer to all these questions ...is in the negative.

Ashley Montague, Ph.D., 1962 (quoted in Hazell, 1976)

Since I didn’t marry until I was 28 and was 31 when I became pregnant, I had the opportunity to listen to and observe the childbirth experiences of many of my peers before it was my turn. Although their experiences varied, they were virtually all quite negative. Among the more common complaints were the red tape at the hospital; an impersonal dehumanizing treatment by the hospital staff (many women never saw their own doctors); being brought the wrong baby (yes, it still happens); infection with contagious disorders of the newborn in the nursery; and forced separation from the baby's father during labor and delivery. Several of my friends had planned on having natural childbirth, but due to confusion or lack of cooperation, they had been given drugs by the nurse or doctor on duty at the time of delivery.

So few women I knew were satisfied with the "typical" hospital delivery, I felt I must find something better. I wanted to have some control over what happened to me and my baby, not simply submit to some assembly-line-like routine and hope for the best.

Pat Harkless, homebirthing mother, 1973 (quoted in Hazell, 1976)
(Homebirthers are) kooks, the lunatic fringe, people who have emotional problems they're acting out.

Saul Lerner, M.D., past president of Massachusetts section of American College of Obstetricians and Gynecologists (ACOG) (quoted in Annas, 1978)

Labor and delivery, while a physiologic process, clearly presents potential hazards to both mother and fetus before and after birth. These hazards require standards of safety which are provided in the hospital setting and cannot be matched in the home setting.

American College of Obstetricians and Gynecologists (ACOG) policy statement, May 1975 (quoted in Annas, 1978)

Hereafter any physician with OB privileges at Yale-New Haven Hospital who intentionally participates in a non-emergency "home delivery" will be viewed as no longer fulfilling the professional expectations of the OB staff of the hospital, and will immediately have OB admitting privileges revoked.

Policy statement, Department of Obstetrics and Gynecology, Yale-New Haven Hospital, November, 1976. (quoted in Annas, 1978)

The quotes above serve to suggest the atmosphere of conflict surrounding childbirth in the United States in the 1970's. While consumers began to protest the increasing technology of obstetrics in the hospital setting and the resulting depersonalization, the small but increasing numbers of home births became a focus of great controversy within the medical community. It is not surprising, in retrospect, that out of the polarities which developed between consumers and providers of health care there evolved innovations in childbirth which attempted to create a middle ground to provide the individualized, non-interventionist care wanted by consumers while also addressing the medical profession's concerns. As we shall see, the pressures resulting from these conflicts led to the
establishment, in 1978, of the birthing program at Happy Camp (California) Health Services. An analysis of the patients and outcomes of this birthing program over the intervening years is the central focus of this paper.

The birthing program at Happy Camp shares many of its origins with a larger U.S. phenomenon, the Freestanding Birth Center. These innovative institutions have attempted to bridge the gap between home birth and hospital delivery, and, as broadly defined, the Happy Camp program can be included in this category. The emergence of the Birth Center is reviewed in the first half of this paper, in order to provide a perspective in which to view the Happy Camp program.

This overview begins with a brief review of the recent history of childbirth in the U.S., noting the dramatic changes which have occurred in this century in persons and places connected with the birthing process. We will discuss the near-extinction of the midwife, and her recent rebirth, which is especially relevant because, as we shall see, the modern Certified Nurse-Midwife was a major driving force behind the Birth Center concept.

Next we will review the more recent history of alternatives in childbirth, including home birth and in-hospital birthing rooms as well as free-standing birth centers. Since the medical establishment's objections to these alternatives have focused on the issue of safety, relevant literature will be discussed.

With this background, the emergence of the Birth Center can be examined. Literature will be reviewed, again with a selective focus on outcomes, a common thread in much of the alternative obstetrical literature.
The Happy Camp birthing program is the focus of the second half of this paper. Geographic, demographic, and historical background is given for the Clinic as a whole, as well as the birthing program. This is followed by the statistical review of the 264 birthing patients seen during the center's eight years.
The history of modern childbirth in the U.S. is inextricably linked to the history of American medicine, and begins with events in the late nineteenth and early twentieth centuries, at which time the seeds of "modern medicine" were being planted.

American medicine in the 1800's stood in marked contrast to its present form. Practitioners were of various levels of skill and training, and with many differing orientations and perspectives. As Ehrenreich (1973) characterizes it:

There were very few schools of medicine in America and very few institutions of higher learning altogether. The general public...was hostile to professionalism and "foreign" elitisms of any type. ...Medical practice was traditionally open to anyone who could demonstrate healing skills--regardless of formal training, race, or sex.

Events in the late nineteenth century, however, began to favor the eventual development of the profession of medicine. The germ theory of disease was imported from Europe and formed the theoretical basis for the establishment of German-style medical schools with patterns of training much like medical schools of today. On a societal level, meanwhile:

The U.S. was emerging as the industrial leader of the world. Fortunes built on oil (and) coal... were maturing into financial empires. For the first time in American history, there were sufficient concentrations of corporate wealth to allow for massive, organized philanthropy, i.e., organized...intervention in the social, cultural, and political life of the nation. Foundations were created as the lasting instruments of this intervention—the Rockefeller and Carnegie foundations appeared in the first decade of the 20th century. One of the earliest and highest items on their agenda was medical "reform," the creation of a respectable, scientific American medical profession. (Ehrenreich, 1973)

Foundation money was channelled into medical schools beginning in 1903. Thus the Carnegie Corporation engaged Abraham Flexner to
tour and evaluate the nation's medical schools. The resulting
document, The Flexner Report, published in 1910, led to the closure
of scores of medical schools.

But medicine did not change overnight, and other practitioners
continued to provide competition to the new medical establishment.
Noteworthy among these were the midwives, who even in 1910 were
still delivering approximately half of all babies in the U.S. and
collecting an estimated five million dollars in fees for doing so.
The medical literature of the time began to abound with discussion
of "the midwife problem." (Yankauer, 1983)

A leader of the move against midwifery was J. Whittredge
Williams, professor of obstetrics (and namesake of Williams' Obstetrics, still the foremost obstetrical text in the U.S.) at
Johns Hopkins. Despite results of his own survey of teachers of
obstetrics in 1911 which indicated that "midwives were somewhat more
competent than the inadequately trained general practitioners," Dr.
Williams argued for the abolition of midwives, with the idea of
replacing them with the products of the newly-endowed medical
schools. This was indeed the action eventually followed, but

not without substantial disagreement which found most public
health authorities lined up on the side of the midwives, and
most of the emerging profession of obstetrics lined up against
them. Many of the arguments on both sides have a familiar ring; each accused the other of being motivated only by financial
concerns; one side condemned medical arrogance, male
chauvinism, and the high costs of medical care, the other
pointed to the inevitability and unpredictability of obstetric
emergencies requiring an operation and the skills of a surgeon.
(Yankauer, 1983)

The medical profession's attack on midwives was multifaceted
and successful. Many states outlawed midwifery entirely.
Obstetricians attacked midwifery publicly "in the name of science and reform" (Ehrenreich, 1973), and were effective in promoting the hospital as the only place for a pain-free, safe birth (Wertz, 1977).

The Return to Home Birth

National statistics on place of birth were not compiled in the U.S. until the 1930's. By 1935, mainly as a result of the increasing power of obstetrics and the decreasing influence of midwifery, hospital births made up 36.9% of all births, and this had increased to 55.8% only five years later. Interestingly enough, in that same year (1940) only 26.7% of non-white births in the U.S. were in-hospital; of the remainder, two-thirds were non-physician attended (Marieskind, 1980). Most, presumably, were attended by midwives, who still continued to serve the nation's minority poor, especially in the South, for example in Kentucky where the Frontier Nursing Service still continues to function. Projects like the Maternity Center Association in New York and the Chicago Maternity Center provided home births for the urban poor. Even by 1950, when 92.8% of white babies were being born in hospitals, non-white babies had a 32.1% chance of being born out-of-hospital. Thus physicians were becoming successful in establishing the hospital as their "workplace" (Young, 1984), while a small non-professional group of traditional practitioners quietly continued to function outside the hospital, and outside the developing professional medical system.

Hospital births continued to increase, reaching a high of 99.4% of all births in 1970. During the 1970's, though, a small but clear change could be noted in this trend. Early in the decade, 1971-1974,
the rate of hospital births plateaued; and beginning in 1975 a subtle but significant trend began to be noticeable, a trend away from in-hospital births (DeVries, 1985):

Table 1. U.S. Out of Hospital Births 1950-1981

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Live Births</th>
<th>Total In Hospital</th>
<th>No. Attended</th>
<th>% Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>3,554,149</td>
<td>3,125,975</td>
<td>428,174</td>
<td>88.0</td>
</tr>
<tr>
<td>1955</td>
<td>4,047,295</td>
<td>3,818,810</td>
<td>228,485</td>
<td>94.4</td>
</tr>
<tr>
<td>1960</td>
<td>4,257,850</td>
<td>4,114,368</td>
<td>143,482</td>
<td>96.6</td>
</tr>
<tr>
<td>1965</td>
<td>3,760,358</td>
<td>3,660,712</td>
<td>99,646</td>
<td>97.4</td>
</tr>
<tr>
<td>1970</td>
<td>3,731,386</td>
<td>3,708,142</td>
<td>23,444</td>
<td>99.4</td>
</tr>
<tr>
<td>1971</td>
<td>3,555,970</td>
<td>3,523,860</td>
<td>32,110</td>
<td>99.1</td>
</tr>
<tr>
<td>1972</td>
<td>3,258,411</td>
<td>3,233,703</td>
<td>24,708</td>
<td>99.2</td>
</tr>
<tr>
<td>1974</td>
<td>3,159,958</td>
<td>3,133,797</td>
<td>26,121</td>
<td>99.2</td>
</tr>
<tr>
<td>1975</td>
<td>3,144,198</td>
<td>3,103,323</td>
<td>40,875</td>
<td>98.7</td>
</tr>
<tr>
<td>1976</td>
<td>3,167,788</td>
<td>3,123,439</td>
<td>44,349</td>
<td>98.6</td>
</tr>
<tr>
<td>1977</td>
<td>3,326,632</td>
<td>3,276,732</td>
<td>49,900</td>
<td>98.5</td>
</tr>
<tr>
<td>1978</td>
<td>3,333,279</td>
<td>3,300,659</td>
<td>31,350</td>
<td>99.0</td>
</tr>
<tr>
<td>1979</td>
<td>3,494,398</td>
<td>3,460,484</td>
<td>33,914</td>
<td>99.1</td>
</tr>
<tr>
<td>1980</td>
<td>3,612,258</td>
<td>3,576,370</td>
<td>35,888</td>
<td>99.0</td>
</tr>
<tr>
<td>1981</td>
<td>3,629,238</td>
<td>3,591,582</td>
<td>37,656</td>
<td>98.9</td>
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</table>

As noted by Pearse (1982), "the highest rates of out-of-hospital birth (were) concentrated in upper New England, in Texas, and along the Pacific coast." In California, 3.6% of babies in 1975 were born out-of-hospital. In Oregon, the rate reached 3.8% that same year; in Alaska, 4.5%. As will be detailed later, this rate was even higher in certain areas of these states. Although these percentages still represent only a small part of the total picture of birth in the U.S., the fact was undeniable that tens of thousands of American women were rejecting the prevalent system of birth and choosing a more traditional alternative. Not surprisingly, this was perceived as a threat by certain members of the medical establishment.
The Safety Issue

An editorial by Warren H. Pearse, M.D. of the American College of Obstetricians and Gynecologists (ACOG), published in the Journal of the American Medical Association (JAMA), March 9, 1979 referred to a "two to five times higher fetal or newborn death rate for out-of-hospital deliveries" as his justification for recommending universal hospitalization for childbirth. This conclusion, which was widely publicized by ACOG, was based on data on out-of-hospital births from eleven state health departments, data which is highly misleading in regard to planned attended home birth. Pearse, then Executive Director of ACOG, is an outspoken opponent of home births. His arguments mainly focus on the presumed danger of home births, although in one study he himself found that fetal deaths occur at rates "equal to or lower than expected for (out-of-hospital) deliveries attended by midwives." (Pearse, 1982)

The home birth movement was led by a number of eloquent spokespersons. Barbara Katz-Rothman (1982), for example, discussed her reasons for choosing a home birth:

In 1973, when I became pregnant for the first time, I thought that the profession of medicine and its hospitals were geared to meeting the physical-health aspects of maternity care. I assumed that hospitals were the safest place for giving birth, but that there were attendant costs to having that safety: notably, a loss of personal autonomy for the birthing woman, and the absence of a loving and warm atmosphere. I divided maternity care into two categories: physical care, which I thought was best obtained in a hospital under careful medical supervision; and socio-emotional support, which was best provided in one's own home by family and friends. That left two choices for optimal care: bringing personal autonomy and social support into the hospital, or bringing safety home. As a sociologist, I thought the former was impossible. I set about researching the latter.

I learned that hospitals have never been demonstrated to be the safest place for a woman to give birth. I learned that
hospitals pose unique dangers for birthing women and their babies, including overuse of medication, higher risk of infection, and numerous obstetrical interferences in the physiological process of birth.

This unspoken danger associated with hospital births was documented in great detail by Suzanne Arms in her book *Immaculate Deception* (1975), which unmercifully attacked hospital care for its psychological and even physical brutality; its unquestioned and often unnecessary use of medication, technology, and surgical intervention; its lack of responsiveness to the needs of childbearing women. This book thus represented a strong disavowal of the methods and philosophies seen by homebirthers as underlying the dominant system of hospital birth.

Another strong condemnation of hospital birth came from Robert Mendelsohn, M.D. (1981), who stated that "after working in hospitals most of my life, I can assure you that they are the dirtiest and most deadly places in town." He warned of risks of nosocomial infections, medication errors, malnutrition, even kidnapping and switched babies. But his main target was the obstetrician, whom he accused of creating problems. "Once he has created the pathology, he has his excuse to intervene."

Annas (1978) described the gap which developed between medical providers and home birthing advocates, relating stories told at an April 1978 meeting of NAPSAC (National Association of Parents and Professionals for Safe Alternatives in Childbirth):

of police and social workers being summoned during or shortly after homebirths by pediatricians alleging child neglect, of physicians being threatened with...license revocation for homebirth participation, and of midwives...under extreme pressure to abandon their vocation.
Certainly policies such as that noted earlier at Yale-New Haven Hospital, in which physicians were in effect forced to choose whether to deliver babies at home or in-hospital, had the effect of isolating physicians who chose to openly attend home births. Other physicians attended home births covertly, although this too involved risks of discovery. Many of the home birth attendants were not physicians, but self-trained lay midwives who were nearly universally rejected by the medical system (Lubic, 1979). This had the effect not only of isolating these practitioners from sources of new knowledge, but at times endangered their patients by limiting their ability to receive care should problems develop.

Amidst the accusatory, but mostly unsubstantiated, claims of both sides of the home birth controversy, researchers began attempting more objective evaluations of the relevant issues.

The first controlled study to compare home and hospital births was that of Mehl et. al. (1977). He studied medical records for 1,146 elective home births in California. These were attended, planned homebirths in which the mothers received prenatal care and were prescreened for suitability (absence of risk factors) for home birth. Patients were matched for age, parity, education, socioeconomic status, length of gestation, and risk factor score with an equal number of women planning hospital births. Perinatal morbidity and mortality were noted to be lower than rates for California as a whole, and there were no significant differences in mortality between the groups. Where differences were seen was in intervention, which in virtually every category measured (including induction, episiotomy and perineal tears, forceps, cesarian
sections, and anesthesia of all types) was significantly greater in the control (hospitalized) group. This group also showed a significantly greater rate of complications including fetal distress, preeclampsia, shoulder dystocia, postpartum hemorrhage, respiratory distress syndrome, birth injuries, and neonatal sepsis.

Numerous other studies have also failed to document the dangers suggested by Pearse. Declercq (1984) studied birth weight and Apgar scores in out-of-hospital births during 1978 and concluded that "the claim that out-of-hospital births are inherently more dangerous receives no support from this data." Hinds (1985) classified out-of-hospital births in Kentucky as planned or unplanned, and not surprisingly found that unplanned births were associated with an increased risk of low birth weight. He also noted that "low birth weight births occurred at less than the expected frequency among planned births." "The Issue of Safety" was addressed in a well-balanced discussion by S. E. Sagov and A. Brodsky in their chapter of Sagov's book Home Birth. They concluded that "for a well-screened low-risk population the probability of an emergent complication (e.g., fetal distress, severe postpartum hemorrhage), which would make the loss of time in transit to a hospital a serious disadvantage in managing labor (whether or not it results in a bad outcome) is less than one per thousand."

The controversy over home births rages in Great Britain as well as the U.S., and here too data has been generated arguing for the safety of planned home birth in a prescreened population. Tew (1985) reviewed the British literature and national statistics and concluded that "perinatal mortality is consistently higher in
consultant obstetric hospitals than in general practitioner maternity units or at home, even after allowance has been made for the greater proportion of births in hospital at high pre-delivery risk." Shearer (1985) performed a prospective review of 387 births to low-risk, multiparous women and found "no evidence of an increased risk associated with home confinements but indicated that there were fewer problems than were encountered in the deliveries of mothers confined in hospital." These problems included more frequent inductions and low Apgar scores, and a higher rate of episiotomies and second-degree tears in the hospital group. Richards (1978) presented data from Britain in his "examination of the risks of hospital delivery" which, consistent with Mehl's work, suggested an increased likelihood of intervention (inductions, cesarian sections, forceps deliveries, epidural anesthesia) for in-hospital deliveries with no improvement in outcome measures.

Adamson and Gare (1980) took an unusually balanced view which attempted to look at the safety issue from a perspective which acknowledges both risks and benefits (some comparable, some unique) for each place of birth. They concluded that "a more humane and respectful approach to these people (home birthers), while not sacrificing the individual principles of either physician or consumer, is possible and necessary." As it turned out, the emergence of the birth center supplied the ideal "neutral territory" to facilitate such a compromise.
There are many possible explanations for the emergence of the Freestanding Birth Center (or simply Birth Center) as a factor in obstetrical care in the U.S. in the 1970's. I have focused thus far on the battle between caregivers (mainly obstetricians) and healthcare consumers (mainly homebirthing women) as a major factor. There were also more broadly based trends in American society that undoubtedly played a role. The women's movement encouraged women to become aware of their potential power (and previous relative powerlessness) in every realm of their lives. Given the paternalistic assumptions underlying medicine, it is not surprising that books like Our Bodies, Ourselves emerged to advocate a more active role for women in their own health care.

Many people trace the natural childbirth movement to the publication in 1959 of Grantly Dick-Read's Childbirth Without Fear (e.g. Eakins, 1984). An early advocate of awake, unmedicated, family-centered childbirth, his ideas were embraced by a number of organizations including the International Childbirth Education Association (ICEA), American Academy of Husband-Coached Childbirth ("Bradley method"), American Society for Psychoprophylaxis in Obstetrics ("Lamaze method"), and La Leche League; and clearly have had an effect on modern obstetrics as pointed out by Adamson (1980): "only a few years ago, physicians routinely sedated women in labor, gave general anesthesia frequently for births, excluded fathers from the birth, and discouraged breast-feeding and rooming-in. This situation has changed."

The ideals of maximizing the quality of the childbirth
experience appealed to women in a time of lower birth rates and smaller families. Although some advocates of natural childbirth chose to leave the medical system entirely to seek a home birth, many women found this too radical an alternative. These women, and their spouses and families, who also wanted to become a part of the childbirth experience, formed a broadly-based group of consumers to whom the Birth Center was a very appealing alternative. This appeal has continued, as evidenced by marketing surveys quoted by the National Association of Childbearing Centers (1984) which suggest that over 40% of women of childbearing age agree "that low-risk pregnancy and birth could be managed in an out-of-hospital setting."

Obstetricians were not the only practitioners providing care for the childbearing woman. The perceived physician shortage in the late 1960's and early '70's provided fertile ground for the expansion of training and employment opportunities for so-called mid-level practitioners: physician's assistants, nurse practitioners, and the like. Of particular relevance here was the emergence of the nurse-midwife, who, as we shall see, has been instrumental in the establishment of the birthing center concept in the U.S.

Also emerging in this period was the newest medical specialist, the "heir of general practice", the Family Physician. These doctors receive three years of post-graduate training in the specialty of general, family-oriented medical care including obstetrics. The ideals of the natural childbirth movement were embraced by many of these young, idealistic pioneers of a new speciality. As we shall see, it was one of this new breed of physicians who helped to make
the birthing center in Happy Camp, California a reality.

Before proceeding further with a brief history and literature review of the freestanding birth center, a few words of clarification are needed. The term "birth center," as defined by the National Association of Childbearing Centers (NACC), and as the term will be used here, refers to "an adaptation of a home environment to a short-stay, ambulatory, health care facility with access to in-hospital obstetrical and newborn services; designed to safely accommodate participating family members and support people of the women's choice; and providing professional preventive health care to women and the fetus/newborn during pregnancy, birth, and the puerperium" (Cooperative Birth Center News, 1981). These facilities are free-standing "in that they operate independently from hospitals in the official, financial, and physical sense" (Eakins, 1984).

NACC currently reports over 150 birth centers open in some 28 states. They are set up to have "the positive aspects of home" and attract women who "are adverse to going to a hospital but are not willing to have a baby at home" (Robischon, 1985). Cohen (1982) compared women choosing these birth centers with women choosing to deliver in a tertiary care hospital, and found that:

Women choosing the birth center were not demographically different from those choosing the tertiary care hospital except that they were somewhat older. However, women choosing the birth center planned to emphasize autonomy and independence rather than intimacy in their child rearing, and they described their partners as much more supportive and involved in the birth, and were much more adaptive in preparation for the birth and the baby's care.

These birth centers must be distinguished from the hospital-based birthing rooms, alternative birth centers (ABCs),
home-style birth rooms, and the like. These supposed alternatives are described by Corea (1985):

Here, where potted plants and flowered drapes hide the machinery, women could give birth without interference. The well-publicized existence of these birthing rooms has led many to feel that things-are-much-better-now (sic).

Katz-Rothman (1983) suggests that these in-hospital centers offer "interior decorating obstetrics" which, she admits "has met widespread consumer acceptance and even enthusiasm." Unfortunately, as many women have discovered, these rooms are reserved for low-risk patients, and from an obstetrical view "is any pregnancy low-risk?" (Wilson, 1980) Corea notes that "with new criteria published by ACOG, 70% of women fall...into 'high risk' categories," and she quotes Gail Brewer who states: "If you're lucky, and if you manage to make it through the thickets and hurdles of prenatal care, you may win the prize and get to go to the birthing room."

In the face of ever-increasing uses of fetal-monitors, fetal scalp blood sampling, and Cesarian sections, these "alternatives" can be seen primarily as a "marketing" technique, to attempt regain consumers "lost" to the home birth and birth center movements. This idea is supported by data from Washington State (Dobbs, 1981) which found a significant relationship between presence of an in-hospital alternative birth room and "perceived local incidence of home deliveries." Not much more will be said about these hospital-based birth rooms.

History of Birthing Centers

Eakins (1984) states that one birth center was known to be in existence in Texas as early as 1972, and a similar out-of hospital
birth center in New Mexico boasted 6,000 births between 1944 and 1970. The emergence of birth centers in the literature, however, focuses almost entirely on the Maternity Center Association's Childbearing Center in New York City (Lubic, 1977).

The Childbearing Center was opened as a "demonstration project" of the Maternity Center Association (MCA) in 1975. Staffed primarily by nurse-midwives, the center has survived despite repeated attacks from the obstetrical community. Interestingly, Ruth Watson Lubic, General Director of MCA (and herself a Certified Nurse-Midwife), carves out a place for birthing centers by subtly attacking both obstetricians and homebirthers: thus her reference to "do-it-yourself home birth," immediately precedes her allusion to "the technologic imperative currently seen in obstetrics." At times, her published articles have avoided natural childbirth issues entirely, instead focusing on the cost-efficiency of birthing centers (Lubic, 1975, 1979, & 1983). All criticisms aside, Lubic and her colleagues at MCA account for the majority of the published literature on free-standing birth centers. In addition, the National Association of Childbearing Centers (formerly the Cooperative Birth Center Network) which has been fundamental, for example, in successfully lobbying the American Public Health Association to endorse the birth center concept and adopt guidelines for their licensure and regulation (APHA, 1979 & 1983), is also a project of MCA.

Despite this lengthy set of APHA guidelines (which includes requirements limiting birth center patients to those in a low-risk category, and mandates full resuscitation equipment and backup
physicians with hospital obstetrical privileges) the American Academy of Pediatrics and ACOG in a 1983 joint statement (quoted in Eakins) claim that "until scientific studies are available to evaluate safety and outcome in free-standing centers, the use of such centers cannot be encouraged." This is interesting in light of reports, such as those by Goldenring (1982), that his study "designed to compare ABC birth outcomes with those in free-standing centres and at home...proved impossible because the obstetricians refused to participate." Despite this lack of support, however:

there is one point as to which there is unanimous agreement—the competing service provided by the (Childbearing) Center has had a profound, and almost all agree, positive impact on New York City hospitals specifically, and trends in obstetric care generally. At least partly as a result of the Childbearing Center, many major New York hospitals are working to "humanize" the delivery of obstetric care (report by Lewin and Associates for the Federal Trade Commission quoted in Lubic, 1983).

Review of the Literature

The major articles reviewing birth centers are summarized in tabular form below, with a discussion following. As is immediately obvious, the format and information included varies from article to article. There is not even agreement on how best to calculate statistics: should the denominator for transfer rates be all prenatal patients, all those actually delivering at the center, or what, for example. Most of the centers are located in urban or suburban areas, and of those that mention distances to the nearest hospital none is anywhere near as far away as the center in Happy Camp.
Table 2. Summary of Published Birth Center Statistics

<table>
<thead>
<tr>
<th>Study</th>
<th>Location</th>
<th>N</th>
<th>Transfers</th>
<th>Ante</th>
<th>Intra</th>
<th>C/S</th>
<th>Epis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faison 1979</td>
<td>New York City New York</td>
<td>714</td>
<td>25%</td>
<td>19%</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>McCallum 1979</td>
<td>El Paso Texas</td>
<td>560</td>
<td>?</td>
<td>8%</td>
<td>4%</td>
<td>2%</td>
<td>?</td>
</tr>
<tr>
<td>Bennett 1982</td>
<td>11 FSBCs U.S.</td>
<td>1937</td>
<td>?</td>
<td>15%</td>
<td>5%</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Reinke 1982</td>
<td>Seattle Washington</td>
<td>527</td>
<td>12%</td>
<td>21%</td>
<td>5%</td>
<td>20%</td>
<td>?</td>
</tr>
<tr>
<td>Zabrek 1983</td>
<td>Jacksonville Florida</td>
<td>111</td>
<td>20%</td>
<td>16%</td>
<td>3%</td>
<td>35%</td>
<td>?</td>
</tr>
<tr>
<td>Eakins 1984</td>
<td>Menlo Park California</td>
<td>251</td>
<td>-</td>
<td>20%</td>
<td>2%</td>
<td>9%</td>
<td>?</td>
</tr>
<tr>
<td>NACC 1984</td>
<td>102 FSBCs U.S.</td>
<td>8020</td>
<td>15%</td>
<td>14%</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

Nielsen (1977) described Lucinia Birth Home in Cottage Grove, Oregon. This early paper was mainly descriptive, including a program of education and care and criteria for admission and transfer that by now have become quite standard (usually following APHA's guidelines). Statistics were included for 152 deliveries over 12 months. Outcomes included 9% spontaneous abortions, 2% antenatal transfers, 7% who chose home delivery, 17% hospital deliveries, and 51% Birth Home deliveries without complications.

Faison (1979) published early results from MCA's Childbearing Center, which he referred to as "a workable solution" to the "problem" of home birth. In 31 months, 1299 "potential clients" came to an orientation session. Of these, 714 registered for prenatal
care. 24.8% of these women were transferred antepartally; 3.5% had spontaneous abortions, a low rate. 304 women began labor at the center, only 43% of those initiating care. 19% of these were transferred intrapartally.

Antepartum transfers were mainly due to unspecified "obstetric problems." Intrapartum transfers were commonly for failure to progress and other dystocias, meconium (which was an indication for transfer regardless of degree), and maternal hypertension.

Faison's comments, written as they were early on in the history of birthing centers, are of some interest in aiding an understanding of the previously-mentioned controversy surrounding MCA's center.

The programs of MCA have always been designed to meet the needs of families and to interpret those needs to the professions charged by society with a serving responsibility. The breadth and depth of the gap which has developed between the two groups is well documented...

An assumption on the part of many professionals—that the disenchanted are on the "lunatic fringe" of society—has been shown to be untrue. In our experience, opting-out families are well aware of the risk of out-of-hospital birth; they are equally aware of what, to them, are the risks of in-hospital birth. Accordingly, their complaints were noted and a service planned that would be responsive and, at the same time, ensure a reasonable expectation of safety which is, of course, of highest priority. Satisfaction and economy follow in that order.

McCallum (1979), in another early study, described the Maternity Center in El Paso, Texas. In 28 months 560 women began labor at this center and its two satellite centers, run by "independent midwives," lay midwives who practice legally in Texas. This article notes that although many women came to the center seeking alternatives to hospital care, others came of financial necessity and "for some women, (was) the first pregnancy for which
they (had) received prenatal care." The tension between the obstetrical community and alternative care at that time was also highlighted.

Relationships between The Maternity Center and El Paso physicians are extremely poor. Private hospitals generally refuse their services to mothers and babies who deliver or receive prenatal care from the midwives. When transport is necessary the mother or baby is taken by private vehicle to the county hospital, seven minutes from The Maternity Center, where relations with physicians and staff range from good to poor...The Maternity Center pays for all hospital bills and attempts to recover their expenses from the families involved. Mexican women are refused services in American hospitals and must be transported to hospitals in Juarez. Since neonatal and maternal mortality are extremely high in these hospitals, transport is avoided whenever possible.

Statistics show that 93% of women initially presenting delivered at the center. 3% of these were breech vaginal deliveries, and two sets of twin were delivered. 7.5% of the patients delivered in-hospital. Of these, 48% required Cesarian section, yielding an overall Cesarian rate of 3.6%. The complicated obstetrics being performed at this center, low transfer rate, and the resulting low Cesarian rate are understandable in light of that area's situation.

The study by Bennetts and Lubic (1982) presents NACC data at an earlier stage of research than the NACC study summarized below, and its statistics will therefore not be discussed here. This article is of interest, though, for its comments on the attempts of its authors (then both at MCA) to study the birthing center in a controlled manner.

Despite our eagerness to initiate experimental strategies such as matched-pair comparisons or randomized control trials, evaluation of this alternative system has been limited to observational studies. Families seeking out-of-hospital care reject the hospital as a setting and will not be randomized into the institution they seek to avoid. Nor, despite many
requests, will hospital practitioners allow randomization to the birth-center system... It seems that, although there are methodological difficulties in evaluation of innovative services and programs, the most persistent problems are primarily political.

Reinke (1982) examined 527 women receiving care at The Birthplace in Seattle over an unspecified period. A total of 12% of these patients were transferred antepartally, and there were two prepartum and one intrapartum fetal death in this group. 73% of the study group began laboring at the center, and 79% of these delivered at the center. Of the 21% transferred intrapartally, over a third were attended in-hospital by Birthplace CNMs, which seems a nice way to ease the transition of hospital transfer. Postpartum transfer rates were 4% maternal and 3.5% fetal. 2 neonatal deaths were ascribed to lethal congenital anomalies.

Most frequent indications for referral prior to labor included spontaneous abortion, breech and other malpresentation, preeclampsia, and problems related to ruptured membranes. Intrapartum transports were most often for prolonged rupture of membranes, failure to progress or prolonged labors, premature labors, and thick meconium.

Average Birthplace labors were 14.5 hours for primiparas and 9 hours for multiparas. Episiotomies were done in only 20% of patients, 9% of whom had extension involving the rectum (3rd or 4th degree). None of these serious lacerations was seen in women without episiotomies: 19% of them had no laceration, and another 58% had only superficial (1st degree) tears.

Indications for postpartum transport included maternal hemorrhage or severe lacerations, neonatal tachypnea and
prematurity. One infant was transferred due to a fractured humerus. Of the cases of perinatal mortality, three were premature stillborns, one was a hydrocephalic stillborn transported in labor, and one was an infant with congenital heart defects who died during corrective surgery at six days of age.

A 1981 article (DeJong) also reviewed data from The Birthplace, but is less inclusive than Reinke so will not be discussed here.

Zabrek (1983) reviewed statistics from Birthpoint, a freestanding birth center in Jacksonville, Florida. (It is interesting but confusing that this out-of-hospital center is referred to as an Alternative Birth Center, a term often used for in-patient units.) Over a two year period, 111 patients were seen for prenatal care. Transfer rates were 20% antepartum and 16% intrapartum. Indications for transfer included past obstetrical history (including grandmultiparity or previous abnormal pregnancy, labor, or delivery), current or past medical history (including kidney disease, hypertension, or other heart disease), abnormalities of the current pregnancy (including excessive or inadequate weight gain, preeclampsia, vaginal bleeding, and multiple gestation), and abnormal labors (including malpresentations, prolonged rupture of membranes, premature labor, gross meconium, failure to progress, and cord prolapse).

65% of patients were delivered without episiotomy, and 80% of these had no lacerations. Stated another way, 55% of patients delivered while retaining an intact perineum. The only postpartum maternal complication was one case of postpartum atony which did not require transfer.
Infants of all patients delivering at the center had Apgars of 8 or more at one minute and 9 or more at five minutes. (Apgar scores, which will be discussed more fully in the Happy Camp case study section below, must be viewed cautiously when used as an outcome variable. They are based on subjective assessments usually made by the practitioner performing delivery, who may tend to view things optimistically.)

Eakins (1984) described The Birth Place in Menlo Park, California. She included an eloquent description of the issue surrounding the establishment of this alternative, parts of which are referred to elsewhere in this paper.

The Birth Place, whose design was formulated in consultation with Suzanne Arms, opened as a birthing center in 1979. Rather than providing practitioners as part of its service (the typical pattern), this center provided an environment, standards of care, and a support staff and was available to community practitioners (who qualified for privileges) to care for their patients who desired an alternative setting. Thus practitioners were both physicians and CNMs.

Statistics were compiled over a three year period, during which time 251 women were admitted in labor. Antepartum care (and possible transfer) was handled individually by each practitioner, so there was no antenatal transfer rate. Intrapartum transfers were 20% of the 251, who were 69% primiparas and 31% multiparas. 37% of deliveries were attended by obstetricians, 29% by family practitioners, and 34% by CNMs.

Episiotomies were done in only 9% of women. The perineum was
intact in 26% of the no-episiotomy group, another 64% had only minor lacerations, and 2% had 3rd degree lacerations involving the anal sphincter.

Over half of the intrapartum transfers were for prolonged or arrested labors: pitocin was not used in the center to augment labor. Other indications included heavy meconium, and prolonged rupture of membranes. Transfers were 84% primiparas. Of those transferred, two thirds received pitocin, 55% had episiotomies, and 12% required Cesarian section. This gives an overall Cesarian section rate of 2% for this disproportionately white and healthy population.

2% of mothers required postpartum transfer, and 1.5% of newborns were also transferred. Mean infant birth weight was 3580 grams, and 93% of infants had Apgar scores of 7-10 at one minute; this rose to 99% at five minutes. There were no maternal or infant deaths.

The NACC survey is the most ambitious attempt at comprehensively studying birthing centers, although unfortunately it has not yet been published except in the organization's own newsletter. This 1983 survey of 102 freestanding birth centers throughout the U.S. reveals much about the character of these centers. 41% were located in a renovated home; 30% as part of a professional office; only 10% in a primary care center setting (as in Happy Camp). 70% of the centers were small (under 100 births per year), 4% very large (over 400 births per year). Others were intermediate.

All centers provided prenatal care, routine laboratory tests,
childbirth education, and intrapartum care. Of women admitted to centers in labor, 57% were attended primarily by a CNM; 15% by an obstetrician; and 1.8% by a family practitioner. The remainder included various combinations of the above, another 11% of which included family physicians.

92% of centers have local anesthesia available; 40% have electronic fetal monitoring; 25% have ultrasound; pitocin is used to induce labor in 10%, to augment in 16%; 20% can perform forceps deliveries; 3% perform dilation and extraction/curettage; 30% perform circumcisions. All these services are available at Happy Camp. Services not at HCHS include Cesarian sections (1%) and tubal ligations (2%). Some of these services are controversial when performed in birth centers, as evidenced by McLoed's (1985) comments that "there is no place for the intrapartum use of pitocin, electronic fetal monitoring, (and) forceps...in birth centers for in their very use...the pregnancy (is) no longer normal and uncomplicated."

Of particular relevance to Happy Camp, 21% of the 65 centers which completed information on distance to nearest backup hospital were greater than 30 minutes away. Unfortunately, no breakdown is made of other statistics with regard to this variable.

14.5% of women who registered for care were referred during the antepartum period; another 14% were transferred while in labor. The latter figure was broken down by primary practitioner: CNMs transferred 16% of intrapartum patients; obstetricians 14.5%; and, interestingly family physicians' rate was lowest, 7.5%. This figure should not be overemphasized, however, since it was calculated on
results from only two centers.

There were no reports of maternal deaths in this survey. Four neonatal deaths (0.45/1000) included one placental abruption, one infant with multiple congenital anomalies, and a pair of 24-week twins delivered prematurely.

Barbara Katz-Rothman, whose publications stand out for their consistently well thought-out views, has addressed the birthing center issue (1983). The abstract of her article, "Anatomy of a Compromise: Nurse-Midwifery and the Rise of the Birth Center," is included below:

The number of out-of-hospital birth centers in the United States is increasing dramatically, from a few scattered "demonstration projects" in the early 1970s to more than 150 such centers in 1983. These centers have been presented as meeting the need and desires of birthing women and their families for an alternative to the hospital. In that sense, they are the promise of the future for birthing women. A second, perhaps latent function of the centers is to meet the needs of practitioners: nurse-midwives also need and desire an alternative to the hospital if they are to develop into high-status, autonomous professionals. Traditional midwives worked in homes; physicians brought birth into hospitals. For the nurse-midwives, a comparatively new breed of practitioner, a new setting of practice may be needed.

This analysis is quite relevant to the Happy Camp case study, as we shall see. Their birth center's first practitioner (in this case a family practice physician) also discovered that "home birth...practice can be lonely, demanding, and exhausting." Add to this the isolation of Happy Camp, and the need to not have the town's only physician stuck out in the woods for hours at a time, and the theoretically undesirable decision to abandon home births for clinic births which was eventually made becomes more than understandable.
Birthing Attendants

Who attends all these home and birth center deliveries? A complete answer to this question is another paper in itself, but included are three distinct groups of practitioners: physicians, midwives, and "others." Each of these groups attends about one-third of total out-of-hospital births. Statistics which are available for 1981 show physicians attending 29%, midwives 34%, and others/unknown 37% of all out-of-hospital births (Pearce, 1982). This out-of-hospital category includes all home births, as well as some birth center births. States, such as California, which license birth centers include birth center births in the "in-hospital" category.

NACC statistics (1984) show Certified Nurse-Midwives (CNMs) as primary practitioners in 75% of birth centers surveyed; obstetricians practiced in 25%, and family physicians in 21%. These figures, too, may be skewed: NACC has a strong organizational identification with CNMs, and CNM-led birth centers may have been more likely to reply to their survey.

Adams (1984) surveyed CNMs in 1982 and found that 14.2% were performing home deliveries, while 12.1% were practicing in a non-hospital birth center. 81.4% were performing deliveries in a traditional hospital setting, with 34% delivering in a hospital birth center. (Totals exceed 100% since some CNMs practice in more than one setting.)
CASE STUDY: HAPPY CAMP, CALIFORNIA

Happy Camp is one of the larger towns in Siskiyou County, which is central California's northernmost county. With an area of 6,281 square miles and a population of 43,100 (estimate as of 12/31/84, Rand McNally, 1987), Siskiyou is by far the largest of California's least densely-populated counties. Of 58 counties, Siskiyou ranks 5th in area and 42nd in population. Looked at another way, the county puts a population about 1% that of Connecticut's into an area nearly a third larger, leading to a population density of 7 persons per square mile (compared to Connecticut's 647 persons per square mile).

There is essentially only one road into and out of Happy Camp, California State Highway 96, which follows the curves of the Klamath River east to Yreka, the county seat (population 8,000) and location of the closest back-up hospital. The 75 miles between these two towns is a 90 minute drive in good weather; but, especially in winter, rock and mudslides, snow, and high water can extend this time considerably. The nearest city with a major medical center is Medford, Oregon, which is another hour north of Yreka on Interstate Highway 5 (the major throughway of California and Oregon's central valley).

Happy Camp itself boasts a 1980 census population of 1110. The town was founded in the early part of the 19th century with a predominantly Native American Indian population. The mid-1800's brought in a rush of gold prospectors (whose modern-day counterparts can still be seen working the Klamath River banks), but they were gradually succeeded by loggers and the lumber industry. The area remains the center of an active lumber industry, and the mill is one
of the town's major employers. The federal government also has a
significant role, employing large numbers of personnel in Forestry
and Fish and Game. The area is a familiar one to white water rafters,
as the Klamath is a very scenic and protected wild river and Happy
Camp is a rafting put-in spot. Although small, due to its isolation
Happy Camp has developed many community resources including both
elementary and high schools, a library, a small social services
office, a tiny private airport, and two grocery stores. The
surrounding Siskiyou Mountains combined with the absence of any
nearby large cities (both Portland and San Francisco are an 8 hour
drive away) inhibits television reception, and the per capita
consumption of home videotapes is high.

Through the years the natural beauty of Happy Camp attracted a
physician occasionally, but the small population and limited
financial resources of the community failed to successfully support
medical care on any continuing basis. In response to the obviously
inconvenient and occasionally life-threatening aspects of being so
far from the nearest medical care in Yreka, a community group began
in 1974 to organize a clinic. Land was donated, and through a
combination of local and outside funds and lots of enthusiastic
volunteer labor the clinic facility was built. Recruitment of a
private physician was unsuccessful, but the community was able to
meet federal standards as medically underserved and in July, 1977
Happy Camp Health Services, Inc. opened, staffed by a National
Health Service Corps physician.

The clinic continues to be community-owned, and is a non-profit
corporation overseen by an eight-member Board of Directors. Board
members include high-ranking local personnel from the mill, the National Forest Service office, and the State Highway Department, and other community leaders including a representative of the Karok Indian Tribe. The Board is a functional one, meeting regularly and making all major fiscal, personnel, and policy decisions for the clinic.

The clinic functions as a regional primary care center, delivering a package of integrated health services which (as noted previously) includes laboratory, x-ray, pharmacy, health education, and social services as well as family practice medical care and the birthing program. The clinic's service area includes seven tiny communities strung for 130 miles along the Klamath River east and west of Happy Camp, and a contract with the Karok Indian Tribe extends care into Orleans in Humboldt County where outreach clinics are held twice monthly. In 1986, the clinic recorded a total of 4,492 patient encounters, and claimed that over 10% of the county's population was in its service area.

National Health Service Corps (NHSC) has provided two physicians for the clinic. The first apparently did not like the area and left after one year (in June, 1978) when he was replaced by Dr. Dennis Vossen, who helped to start the birthing program. In June, 1984 Dr. Vossen resigned. Although still eligible for a NHSC physician, the federal government was unable to fill the position, so the community again turned to the private sector and eventually was able, with the assistance of state grant funds, to hire Dr. Frank Sweeney who began at HCHS in September of 1984.

Staffing difficulties have been a recurrent problem for the
clinic. Limited resources have in the past prevented adding a second physician to share the burden of constant on-call coverage. Physician assistants and nurse practitioners have been used at various times, but these providers are not trained to function without backup and thus the clinic physician was still required to be available for emergency situations. Dr. Sweeney is currently working alone, and is presumably looking forward to being joined by a second physician later this year.
The story of the birthing program at the Happy Camp clinic was recounted by Dr. Vossen in an article he wrote for a NHSC publication in 1979:

Within a month of my arrival to Happy Camp, July 10, 1978, I received several inquiries concerning whether or not I would consider doing home deliveries. There were several young and pregnant ladies at the time who did not want to drive the long distance to the hospital and who also wanted a home style delivery. Ten years ago a previous doctor in Happy Camp offered clinic deliveries which were much appreciated and remembered by the people here.

I responded to these requests with interest because I had considered doing some obstetrics prior to my arrival in Happy Camp and felt it would provide a needed service and satisfy my own personal interest. I personally felt there was a need in the low-risk mothers to have a prepared natural childbirth in a home style setting without medications, to allow the mother to labor in the most comfortable position, to have friends and family present, and to suckle and bond with her baby.

In September of 1978, we, the clinic staff, met to organize and set up policies and procedures for doing home-style deliveries in Happy Camp. We first decided it would be best to start with clinic deliveries only and not to do home deliveries until well organized and more experienced...I spent a day with...(an) obstetrician in Medford, Oregon, to discuss our plans and back-up possibilities...He was willing to not only back us up anytime, but to fly into Happy Camp for emergencies...

Plants, paintings, wall hangings, rugs, a quilt, a baby crib, chairs, lamps, and wood for the bed were donated. The bed was made out of two-by-fours and plywood topped with a four inch foam pad...We received a grant from the March of Dimes which we are using to buy infant resuscitation equipment, a doppler, an Ivac controller, and to modify our infant warmer...

Probably the most difficult part of the program has been setting policies, procedures and costs...We needed policies on accepting or rejecting certain mothers according to their risk factors: age, parity, serious illnesses, and past obstetrical history. Informed consents, making sure the parents understand and accept the risk of being so far from the hospital are signed by the parents. Birthing plans are also made out by the parents concerning any special requests for birth...

We received a visit from the State Health Department to inspect our birthing room and to review our policies and procedures. They were quite interested because we were the first clinic in
California to request a permit for clinic deliveries. In fact, they applauded our effort because of the care it would give people who would otherwise have home deliveries attended by inexperienced people...

Our first clinic delivery turned out to be two deliveries, one hour and twenty minutes apart. We were lucky to have an extra holding room with a bed to quickly turn into a secondary birthroom. Both deliveries were very normal and natural, besides being beautiful and exhilarating for all participants...These experiences were very positive and encouraging signs for us to continue with our work.

In these passages we get a sense that the desire for alternatives to in-hospital births was strong in Happy Camp during the late 1970's. This is certainly borne out by the statistics below (obtained from the California State Health Department). In examining these numbers we must bear in mind that as a state licensed birthing center, deliveries at the Happy Camp clinic are classified as in-hospital births. The out-of-hospital category includes all homebirths, planned and unplanned, attended and nonattended.

**Table 3. Out of Hospital Births 1977-1985**

<table>
<thead>
<tr>
<th>Year</th>
<th>State of California</th>
<th>Siskiyou County</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Births</td>
<td>Out-of-Hosp</td>
</tr>
<tr>
<td>1977</td>
<td>347,431</td>
<td>4,974 (1.4%)</td>
</tr>
<tr>
<td>1978</td>
<td>356,156</td>
<td>5,625 (1.6%)</td>
</tr>
<tr>
<td>1979</td>
<td>379,187</td>
<td>5,366 (1.4%)</td>
</tr>
<tr>
<td>1980</td>
<td>403,007</td>
<td>5,175 (1.3%)</td>
</tr>
<tr>
<td>1981</td>
<td>420,907</td>
<td>5,321 (1.3%)</td>
</tr>
<tr>
<td>1982</td>
<td>429,902</td>
<td>5,244 (1.2%)</td>
</tr>
<tr>
<td>1983</td>
<td>436,083</td>
<td>5,006 (1.1%)</td>
</tr>
<tr>
<td>1984</td>
<td>447,577</td>
<td>4,965 (1.1%)</td>
</tr>
<tr>
<td>1985</td>
<td>471,156</td>
<td>4,654 (1.0%)</td>
</tr>
</tbody>
</table>

Assuming that the rate of unplanned births remains relatively constant from year to year (and may be somewhat higher in Siskiyou County than the state as a whole due to the large distances required for travel to hospital), it seems apparent that in 1978 when Dr. Vossen began delivering babies in Happy Camp there were a
significant number of women having planned home births.

This data becomes even more impressive when viewed in comparison with another California county, which gained nationwide recognition as a center for homebirthers in the 1970's. Santa Cruz County was home to the Santa Cruz Birth Center, an organization of lay homebirth practitioners who received national publicity when they were "busted" in 1972 (documented in greater detail by Arms, 1975). Mehl (1975) implies that based on information he obtained from these lay midwives and others, the home birth rate in Santa Cruz from 1971-73 may have been as high as 25% (although many were not recorded as such due to the hostile reception being given to homebirthers at that time).

Later that decade things had quieted down from a legal perspective, and there is no reason to suspect underreporting of home births was any more frequent an occurrence in Santa Cruz than in Siskiyou County. We can thus compare the recorded out-of-hospital birth rates for these two counties:

<table>
<thead>
<tr>
<th>Year</th>
<th>Santa Cruz Births</th>
<th>Out-of-hosp</th>
<th>Siskiyou Births</th>
<th>Out-of-hosp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>2556</td>
<td>209 (8.2%)</td>
<td>427</td>
<td>25 (5.9%)</td>
</tr>
<tr>
<td>1980</td>
<td>2947</td>
<td>193 (6.5%)</td>
<td>505</td>
<td>28 (5.5%)</td>
</tr>
<tr>
<td>1984</td>
<td>3592</td>
<td>163 (4.5%)</td>
<td>467</td>
<td>30 (6.4%)</td>
</tr>
</tbody>
</table>

The numbers here, especially for Siskiyou County, are small enough that statistical analysis is inappropriate, but they allow one to conclude that Siskiyou County's rate of out-of-hospital births is similar to that of Santa Cruz County, which is renown for its very high rate of home birth.
The larger medical community of Siskiyou County was also apparently feeling the effects of this trend toward alternative childbirth. In 1980 Siskiyou General Hospital's Alternative Birth Center (A.B.C.) opened in Yreka. More attractive alternatives such as the A.B.C. and the Happy Camp clinic may have contributed to the lower incidence of homebirth seen thus far in the 1980's in Siskiyou County. This is only speculation: a systematic study of this correlation is beyond the scope of this paper.
The birthing program at Happy Camp Health Services has maintained a birthing log since those first two clinic deliveries in November, 1978, which was also the source for brief reviews compiled previously by Drs. Vossen (1979, 1981) and Sweeney (1986). Data entered for each birth includes date of delivery; gestational age; mother's name, parity, and age; newborn's sex, weight, and Apgar scores at one and five minutes; place of delivery; length of labor; whether episiotomy was performed; presence of tearing or laceration of the birth canal or perineum; estimated blood loss; and any complications. Circumcisions are noted as being done or not done in some cases, although there is no delineated column for this data.

The data was coded by the author in a format to allow processing using the SPSS statistical package on the University of Connecticut Health Center Univac mainframe computer. This necessitated some adjustments to the data. Cases were numbered and patient names omitted to preserve confidentiality. Gestational age, length of labor, and birth weight were rounded up to the nearest whole number when the log indicated half weeks, half hours, or half ounces. When two numbers were given for length of labor (e.g. "6-7") the larger number was entered. Rather than coding cc's of blood loss as recorded in the log, notation was made of presence or absence of postpartum hemorrhage using the conventional definition of hemorrhage as blood loss greater than 500 cc's. Complications were coded individually from the comments in the log. Forceps deliveries, cesarian sections, and transfers were all taken from notations in the
"complications" column of the log.

As will be obvious when reviewing the data, not every logbook entry lists each piece of information (i.e., there is missing data). Particularly in the case of hospital births there was often much missing data, and the data that was obtained was inconsistent from case to case. Data coded as missing was omitted from all analyses.

SPSS procedures used in data analysis included FREQUENCIES (for descriptive statistics), CROSSTABS (for interrelations between categorical and continuous variables), ANOVA (for interrelations between continuous variables), and NEW REGRESSION (for correlations among continuous variables).

As noted previously, HCHS has had two different physicians performing deliveries since starting its birthing program. This introduces an element of bias, since each practitioner chose to include what he felt was relevant (and omit what he found irrelevant) when completing the log. Thus, for example, all six of the spontaneous abortions noted in the log occurred while Dr. Sweeney was clinic physician: thus I suspect that Dr. Vossen may have simply chosen not to include SABs in the log leading to an underestimate of the incidence of SABs in this population. In comparison, nearly all the notations regarding circumcision were noted in connection with births performed by Dr. Vossen. The statistics we will focus upon most, however, were recorded quite consistently in a large percentage of the births logged, and thus this bias is hopefully not a large factor in considering the validity of the data presented here.
RESULTS

Results will be presented in this section. After briefly reviewing trends by year of the birthing program, data will be divided into two sections. The first section will describe the mothers and their babies, including maternal risk factors. In the second section, fetal and maternal outcomes will be described.

Births by Year

Table 5. HCHS Births by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>All Locations</th>
<th>Clinic</th>
<th>Home</th>
<th>Hosp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1979</td>
<td>31</td>
<td>13</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>1980</td>
<td>54</td>
<td>38</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>1981</td>
<td>28</td>
<td>15</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>1982</td>
<td>29</td>
<td>20</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>1983</td>
<td>35</td>
<td>21</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>1984</td>
<td>21</td>
<td>14</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>1985</td>
<td>30</td>
<td>23</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>1986</td>
<td>26</td>
<td>11</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>TOTAL</td>
<td>260*</td>
<td>159</td>
<td>24</td>
<td>77</td>
</tr>
</tbody>
</table>

* Excludes 6 SABs and 1 pt with unknown place of delivery.

Over the nine years of its existence, the birth program has served 264 women for prenatal care, with a resultant 267 outcomes. Outcomes exceed patients due to three twin births, which bear brief mention. The first set, vertex/vertex twin boys with weights of 6 pounds 6 ounces and 6 pounds 2 ounces, were delivered by Dr. Vossen at HCHS in 1980. That same year the second set of twins were born in-hospital, having been referred due to the second twin presenting breech. The mother of the third set of twins (born in 1986) was referred for hospital delivery by Dr. Sweeney, but unexpectedly presented to HCHS late in labor. The first twin was delivered at the clinic, but the mother required transport when the second infant had
not delivered three-and-a-half hours later. Twin B was delivered by Cesarian section at Siskiyou General Hospital in Yreka.

The birth log begins on November 11, 1978 and ends on November 26, 1986. The calendar years of 1978 and 1986 are truncated: the study covers a period of 96.5 months, rounded to eight years in the statistics below.

159 of the 260 deliveries occurred at HCHS (61%), 24 at home (9%), and 77 in hospital (29%). The latter two groups are heterogeneous and can be further subdivided (see Table 6 below). The average number of women served per each of the eight years is 32.5, which represents 7% of the 450 births per year recorded in Siskiyou County during this period. 1980 was the busiest year, and corresponds to the county's highest birth rate for the period studied. The dropoff in 1984 is explained by the gap between Dr. Vossen's departure and Dr. Sweeney's arrival.
MATERNAL AND FETAL VARIABLES

Maternal and fetal variables, summarized in Table 6 below, will be described individually in the sections to follow.

Table 6. Maternal and Fetal Variables
Clinic Deliveries and All Patients

<table>
<thead>
<tr>
<th>Parameter</th>
<th>n</th>
<th>Mean</th>
<th>S.D.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Age</td>
<td>151</td>
<td>26.0</td>
<td>5.0</td>
<td>18</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>249</td>
<td>26.3</td>
<td>5.4</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>Weeks Gestation</td>
<td>155</td>
<td>39.9</td>
<td>1.3</td>
<td>32</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>246</td>
<td>40.0</td>
<td>1.6</td>
<td>26</td>
<td>43</td>
</tr>
<tr>
<td>Hours of Labor</td>
<td>153</td>
<td>9.6</td>
<td>0.5</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>214</td>
<td>10.8</td>
<td>0.6</td>
<td>1</td>
<td>72</td>
</tr>
<tr>
<td>Infant Weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pounds</td>
<td>154</td>
<td>7.9</td>
<td>1.1</td>
<td>4.8</td>
<td>10.7</td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>7.8</td>
<td>1.1</td>
<td>2.4</td>
<td>11.0</td>
</tr>
<tr>
<td>Grams</td>
<td>154</td>
<td>3594</td>
<td>478</td>
<td>2159</td>
<td>4858</td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>3555</td>
<td>522</td>
<td>1080</td>
<td>5000</td>
</tr>
<tr>
<td>Parity</td>
<td>155</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primiparous*</td>
<td>47</td>
<td></td>
<td></td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>88</td>
<td></td>
<td></td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>Multiparous</td>
<td>100</td>
<td></td>
<td></td>
<td>65%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>158</td>
<td></td>
<td></td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td>Grand Multip (parity &gt;4)</td>
<td>8</td>
<td></td>
<td></td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Infant Sex</td>
<td>155</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>78</td>
<td></td>
<td></td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>125</td>
<td></td>
<td></td>
<td>51%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>77</td>
<td></td>
<td></td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>121</td>
<td></td>
<td></td>
<td>49%</td>
<td></td>
</tr>
<tr>
<td>Circumcisions</td>
<td>56</td>
<td></td>
<td></td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>66</td>
<td></td>
<td></td>
<td>36%</td>
<td></td>
</tr>
</tbody>
</table>

*Includes both actual and "functional" primigravidas.

Maternal age

Mean maternal age for clinic deliveries was 26.0, quite comparable to the mean age overall of 26.3. The range for clinic deliveries was 18 to 37 years, and overall from 16 to 40 years. Outliers were too few to analyze in any systematic way, but we may
note anecdotally that of three 16 year old mothers two delivered in-hospital without problems. Full delivery data for the third was missing. The one 40 year old mother was transferred for hypertension, but also delivered a healthy infant. Teenage pregnancy as a significant social problem is not highly in evidence in this population. 15 of the clinic deliveries (9%) were to teen-aged mothers, all 18 or older.

Weeks gestation

Gestational age (which excludes SABs), as expected, shows a mean very close to 40 weeks in both the clinic and overall populations. Also expected is the larger range for the total population since early (premature) and late (postmature) infants are at greater risk, and their mothers are most often transferred for hospital delivery. The most dramatic outlier in this category was a 26-week premature infant delivered, after transfer, at U.C. San Francisco to a mother with an incompetent cervix and premature rupture of membranes. Birth weight was 1080 grams (2 pounds 6 ounces). This infant survived and is reportedly doing well.

Length of Labor

Mean hours of labor for the clinic deliveries was nearly ten, and slightly higher in the total population. All hospitalized patients showed a mean of 17 hours of labor (significantly higher than the clinic population), but this figure is skewed by the fact that many of the intrapartum transfers were necessitated by prolonged labors.

Friedman (1978) documented what had long been clinical wisdom in obstetrics: that primiparas have longer labors than multiparas.
This was demonstrated in the study population. Multips averaged 8.2 hours of labor, while primips averaged 15.5 hours ($F = 29.4$, $p < .0001$).

**Parity**

The study population was about a third primiparous women. An arbitrary definition of parity > 4 was used to define "grand multiparas," but such classification was not found to be statistically useful and these women were included in the multiparous group for purposes of analysis. Parity, included here as a descriptive statistic, was also shown to be a factor affecting outcomes.

Primiparous women in our population were over three times more likely to require episiotomy (corrected Chi-square = 28.4, $p < .0001$), and to sustain some degree of laceration (Chi-square = 14.2, $p = .007$). They were nearly four times as likely to require Cesarian section: this third of the population require nearly two-thirds of the Cesarians (corrected Chi-square = 7.9, $p = .005$). They were nearly twice as likely to be transferred (Chi-square = 19.2, $p = .004$), and accounted for 8 of the 9 cases in which forceps were used (corrected Chi-square = 10.3, $p = .001$). Primiparas accounted for nearly two-thirds of the cases of premature or prolonged rupture of membranes (corrected Chi-square = 4.7, $p = .03$), although this figure is confounded by the preponderance of longer labors in this group. Maternal complications examined as a whole occurred in 31 primips and 37 multips (Chi-square = 10.8, $p < .02$), but fetal complications were actually noted in proportionately fewer primips than multips although not to a significant degree (Chi-square = 5.1,
p < .10).

Parity did not effect gestational age or one-minute Apgar scores. Interestingly five-minute Apgar scores were slightly higher in infants with primiparous mothers (9.56 versus 9.34), but this result just failed to reach accepted levels of significance (F = 3.5, p = .06). Parity was not shown to influence rates of postpartum hemorrhage or retained placenta.

Infant Weight

Trends in infant weight parallel those regarding gestational age. This is certainly not surprising: the longer the pregnancy, the larger the babies get. In our study these two measures correlated to r = .48 (p < .0001). Thus we see that both the largest and smallest babies tend to be born in the hospital. Three low birthweight (less than 2500 grams) (1.9%) and four high birthweight (over 4400 grams) (2.5%) were born in the clinic. This compares favorably with incidences reported in the literature (particularly in light of the geographic isolation of Happy Camp) and suggests that appropriate screening for these potential problems is being done.

Simmons (1983), reviewing births in Michigan, found an incidence of low birth weight of 2.4% in hospital births, 3.9% in home births. Mean birth weights (in 1979) were 3351 grams for in-hospital, 3301 grams for home. Thus clinic statistics are comparable for mean birth weight, with a suggestion of a possible decrease in low birth weight due to good prenatal care (which was not taken into account in the cited study).

Infant sex

The expected slight preponderance of male newborns is suggested
in the overall data, 51% male babies, 49% females, although Chi square test indicates no significant difference. The clinic deliveries were also nearly identically split by sex.

Circumcision

Data regarding circumcision, as noted previously, was available for only a limited number of cases. The incidence of circumcision, about 35%, is quite low, which deserves some comment. A recent survey (Davenport, 1984) suggests that fewer males are being circumcised since both the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists concluded during the 1970s that routine circumcision is medically unnecessary. Reported circumcision rates (based on hospital head nurses responses to a mailed survey) were quite high, up to 96%, in some states (Connecticut ranked near the top with 93%) but were low in California (56%). Texas showed the lowest rate, 45%.

Thus the HCHS population shows a rate much lower than the rate for California overall. Aggressive counseling against circumcision by HCHS practitioners probably contributed: Dr. Sweeney reports that Dr. Vossen strongly opposed circumcision and even at times required that mothers be present for this procedure! The previously-mentioned bias of reporting tends to weaken the validity of this measure somewhat.
OUTCOMES

Summary data for outcome variables is included below in Table 7 and detailed in the pages which follow. Infant Apgar scores and maternal and fetal complications will also be summarized and discussed later in this section.

Table 7. Outcomes for HCHS Prenatal Patients
\( (N = 264*) \)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous Abortions</td>
<td>6 (2%)</td>
</tr>
<tr>
<td>HCHS deliveries</td>
<td>159 (60%)</td>
</tr>
<tr>
<td>Home births</td>
<td>24 (9%)</td>
</tr>
<tr>
<td>Attended by HCHS M.D.</td>
<td>8 (3%)</td>
</tr>
<tr>
<td>Other planned home birth</td>
<td>14 (5%)</td>
</tr>
<tr>
<td>Unplanned home birth</td>
<td>2 (.7%)</td>
</tr>
<tr>
<td>Hospital deliveries</td>
<td>77 (29%)</td>
</tr>
<tr>
<td>Patient chose hospital</td>
<td>33 (13%)</td>
</tr>
<tr>
<td>Antenatal transfer</td>
<td>27 (10%)</td>
</tr>
<tr>
<td>Intrapartum transfer</td>
<td>16 (6%)</td>
</tr>
<tr>
<td>Place of delivery unknown</td>
<td>1 (.4%)</td>
</tr>
<tr>
<td>Postpartum transfers</td>
<td>3 (1%)</td>
</tr>
<tr>
<td>Maternal</td>
<td>1 (.4%)</td>
</tr>
<tr>
<td>Neonatal</td>
<td>2 (.7%)</td>
</tr>
<tr>
<td>Total deliveries</td>
<td>260</td>
</tr>
<tr>
<td>Vaginal deliveries</td>
<td>236 (92%)</td>
</tr>
<tr>
<td>Forceps-assisted</td>
<td>9 (3%)</td>
</tr>
<tr>
<td>Cesarian sections</td>
<td>21 (8%)</td>
</tr>
</tbody>
</table>

*267 outcomes for 264 patients due to 3 sets of twins.

Spontaneous Abortions

Of the 264 women receiving prenatal care, only 6 pregnancies are recorded as terminated by spontaneous abortion (SABs). The low incidence (2%) of SABs (expected is 10-15%) is almost certainly explained by the bias in data entry discussed previously: Dr. Vossen simply didn't enter into the birthing log patients he saw with SABs.

Home Births

Home births totalled 9% of births over the eight year period, as compared with a county-wide average of 6% home births. Chi-square
for this difference reaches $p < .10$, but fails to reach accepted levels of significance. Thus home births within the HCHS population are at least as high as comparable figures county-wide.

Prior to setting its current policy restricting home births, Dr. Vossen performed 8 planned home births without significant problems, and also saw two women at home in labor who then came into the Clinic and delivered there without problems.

Two of the home births were unplanned, thus giving an overall incidence of 0.7% of the population studied, and 8% of total home births. This tends to substantiate our assumption that the majority of home births are planned, although the number of "accidents" is large enough to significantly effect outcome statistics if included in the home birth category. There were, incidentally, no adverse outcomes in the 2 unplanned home births in this study.

Hinds (1985) surveyed women who had given birth at home in Kentucky over a two year period and found that 71% were planned home births. This yields a larger rate of unplanned homebirths than in our study population. The two populations are not totally comparable, though, because presumably many of the women Hinds surveyed had no prenatal care in addition to their unplanned home births.

Hospital deliveries

Less than 30% of patients delivered in the hospital, and these deliveries were divided among a number of hospitals in California and Oregon. Hospitals most frequently used were Rogue Valley Medical Center in Medford, Oregon (42%); Siskiyou General in Yreka (34%); and Ashland Community Hospital in Ashland, Oregon (16%). 44% of the
women birthing in-hospital did so by choice; the other 56% (16% of patients planning clinic delivery) were transferred to hospital care due to complications or unacceptable risk factors for clinic delivery.

The antenatal transfer rate (which includes all of pregnancy up to the onset of labor) was 10%. An additional 6% of patients required intrapartum transfer; postpartum transfer rate was 1%. A breakdown and discussion of the indications for these transfers is included in a separate section below.

The overall rate of Cesarian sections was 8%, all (obviously) performed in hospitalized patients. Of the total of 78 hospital births, 21 (28%) were by Cesarian section. Further breakdown of this data, noted in Table 8, shows that this inflated rate is due entirely to those patients transferred from clinic for complications.

Table 8. Breakdown of Cesarian Section Rates

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Cesarian Section Rate</th>
<th>Expected*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chose Hospital**</td>
<td>32</td>
<td>4 (12.5%)</td>
<td>2.5 (8%)</td>
</tr>
<tr>
<td>Transferred***</td>
<td>43</td>
<td>17 (40%)</td>
<td>3 (8%)</td>
</tr>
</tbody>
</table>

* Based on 8% C/S rate for the total study population
**Chi-Square = 1.0 (NS)  ***Chi-Square = 70.2, p < .001

Apgar Scores

Table 9. Infant Apgar Scores

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>S.D.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apgar-1 Minute</td>
<td>156</td>
<td>8.0</td>
<td>1.5</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>201</td>
<td>8.1</td>
<td>1.4</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Apgar-5 Minute</td>
<td>156</td>
<td>9.4</td>
<td>0.7</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>202</td>
<td>9.4</td>
<td>0.7</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>
Table 10. Comparison of Apgar Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Minute Apgar Scores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No complications</td>
<td>120</td>
<td>8.4</td>
<td>1.07</td>
</tr>
<tr>
<td>Any complications*</td>
<td>81</td>
<td>7.6</td>
<td>1.07</td>
</tr>
</tbody>
</table>

5 Minute Apgar Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No complications</td>
<td>121</td>
<td>9.6</td>
<td>0.57</td>
</tr>
<tr>
<td>Any complications**</td>
<td>81</td>
<td>9.1</td>
<td>0.79</td>
</tr>
</tbody>
</table>

* F = 15.5, p = .0001
** F = 25.5, p < .0001

Infant Apgar scores (a ten-point rating scale which assesses neonatal color, muscle tone, heart rate, respiratory effort, and reflex irritability) are described in Tables 9 and 10 above.

One and five-minute Apgar scores were comparable for clinic and overall populations. One minute scores showed a mean close to 8.0, and five minute scores 9.4. Place of birth was not shown to be a significant determinant of Apgar scores*. The presence of complications (maternal or fetal) did, however, correlate to a significant degree with lower Apgar scores as noted above. This makes intuitive sense, since some of the fetal complications considered are closely related to some of the measures contributing to the Apgar score.

Complications

Maternal and fetal complications of the clinic deliveries are noted in Table 11 below. These are all patients delivering at the

* Breakdown of 1 minute and 5 minute Apgar scores by birth location (home, hospital, or clinic) showed:
  F = 2.28, p = .10 for 1 minute Apgars
  F = 1.69, p = .19 for 5 minute Apgars
clinic, so excluded are all antenatal and intrapartum transfers (discussed in a separate section below). Postpartum transfers, included in these data, are also discussed in detail in a separate section.

Table II. Complications of 159 deliveries at HCHS

Maternal Complications

<table>
<thead>
<tr>
<th>Condition</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teenage mother (less than 20 y.o.)</td>
<td>15</td>
</tr>
<tr>
<td>Postpartum hemorrhage</td>
<td>12</td>
</tr>
<tr>
<td>Greater than 41 weeks gestation</td>
<td>9</td>
</tr>
<tr>
<td>Retained placenta</td>
<td>7</td>
</tr>
<tr>
<td>Forceps</td>
<td>7</td>
</tr>
<tr>
<td>Pitocin augmentation required</td>
<td>5</td>
</tr>
<tr>
<td>Dystocia without pitocin</td>
<td>4</td>
</tr>
<tr>
<td>Third or fourth degree laceration</td>
<td>4</td>
</tr>
<tr>
<td>Retained placental fragment</td>
<td>4</td>
</tr>
<tr>
<td>Rupture membranes prior to labor</td>
<td>4</td>
</tr>
<tr>
<td>Twins**</td>
<td>3</td>
</tr>
<tr>
<td>Labor over 24 hours</td>
<td>3</td>
</tr>
<tr>
<td>Polyhydramnios</td>
<td>2</td>
</tr>
<tr>
<td>Pitocin induction</td>
<td>2</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>1</td>
</tr>
<tr>
<td>Endometritis</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>Gestational D.M.</td>
<td>1</td>
</tr>
<tr>
<td>Precipitous labor</td>
<td>1</td>
</tr>
<tr>
<td>No prenatal care</td>
<td>1</td>
</tr>
</tbody>
</table>

**This represents one pair of twins and the first of two twins delivered at HCHS. Second twin of second pair delivered by Cesarian section after transfer.

Fetal Complications

<table>
<thead>
<tr>
<th>Condition</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Apgars*</td>
<td>20</td>
</tr>
<tr>
<td>Meconium-thin or staining</td>
<td>14</td>
</tr>
<tr>
<td>Required resuscitation</td>
<td>4</td>
</tr>
<tr>
<td>Cord knot</td>
<td>4</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>4</td>
</tr>
<tr>
<td>High weight (more than 4400 gm)</td>
<td>4</td>
</tr>
<tr>
<td>Low weight (less than 2500 gm)</td>
<td>3</td>
</tr>
<tr>
<td>Meconium-thick</td>
<td>2</td>
</tr>
<tr>
<td>Jaundice</td>
<td>2</td>
</tr>
<tr>
<td>Premature</td>
<td>2</td>
</tr>
<tr>
<td>Shoulder dystocia</td>
<td>1</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>1</td>
</tr>
<tr>
<td>Nuchal cord</td>
<td>1</td>
</tr>
</tbody>
</table>

* 1-minute less than 7 or 5-minute less than 8.
It should be noted briefly that in only three of the cases included above were complications of such severity that transfer to hospital was necessary. Also, as discussed elsewhere, there were no maternal or fetal/neonatal deaths.

This list of complications again compares favorably with the literature. Having a physician practitioner who performs manual extractions of retained placentas, dilation and curettage, pitocin stimulation of labor, and complicated surgical repairs contributes greatly to a lower postpartum transfer rate than some centers limited by training and/or restrictive protocols. The clinic has even recently organized a network of community members available on-call as emergency blood donors should the need for transfusion arise.

Infection

Dr. Sweeney, in his presentation to the California Association of Free-Standing Birth Centers (1986), first noted the impressively low incidence of maternal infection in the HCHS clinic population. The rates of both chorioamnionitis (intrapartum infection) and endometritis (postpartum infection) are each less than one percent. This contrasts quite impressively with published rates. Cavanagh (1982) estimated endometritis at 4%, and Driscoll (quoted in Romney, 1975) found evidence of chorioamnionitis in up to 11% of fetal membranes. Unfortunately, the NACC study did not include infection rates in their data.

These low rates of infection do make some sense, and support the idea that hospitals often harbor highly virulent organisms compared to those in the community. An attitude of non-intervention,
with avoidance of unnecessary vaginal exams and artificial rupture of membranes, may also contribute. Unfortunately, our data does not include demographics. It seems likely, however, that the rural population served by HCHS may well tend to have a lower baseline infection rate than, for example, an inner city population.

**Postpartum Hemorrhage and Meconium**

Postpartum hemorrhages occurred in 7.5% of women delivering at the clinic, somewhat higher than the 5% quoted by Pritchard (1986). Estimation of blood loss is a less than scientific endeavor, however, and the HCHS incidence includes some patients not identified as having hemorrhage but simply noted as having blood loss greater than 500 cc's. Meconium was present in 10% of deliveries, which is consistent with the 10 to 13% incidence given by Pritchard.

**Transfers**

<table>
<thead>
<tr>
<th>Table 12. Indications for Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Women transferred during pregnancy, prior to labor</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>(n = 27, 27/210 = 13%)</td>
</tr>
<tr>
<td>Ruptured membranes without labor</td>
</tr>
<tr>
<td>Breech presentation</td>
</tr>
<tr>
<td>PIH-pre-eclampsia</td>
</tr>
<tr>
<td>Postdates</td>
</tr>
<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>Incompetent cervix</td>
</tr>
<tr>
<td>Repeat Cesarian section</td>
</tr>
<tr>
<td>Twin gestation</td>
</tr>
<tr>
<td>Transverse lie</td>
</tr>
<tr>
<td>Small pelvis</td>
</tr>
<tr>
<td><strong>Women transferred during labor</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>(n = 16, 16/183 = 9%)</td>
</tr>
<tr>
<td>Labor arrest-failure to progress</td>
</tr>
<tr>
<td>Other dystocia</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
</tr>
<tr>
<td>Prolonged rupture of membranes</td>
</tr>
<tr>
<td>Unknown</td>
</tr>
</tbody>
</table>
Infants transferred
\( (n = 2, \frac{2}{159} = 1.3\% ) \)

- Premature ........................................... 1
- Hypoglycemia, r/o sepsis ...................... 1

Maternal postpartum transfer
\( (n = 1, \frac{1}{159} = 0.6\% ) \)

- Chorioamnionitis ........................................ 1

Indications for transfer are tabulated above. Both the rates and the indications for transfer are quite consistent with the literature (as reviewed previously). The NACC Survey (1984) gives an intrapartum transfer rate of 13.8% overall, higher than the 9% noted in the study population. When the NACC statistics are stratified by primary care provider, however, the rate for family physicians is a comparable 7.5%.

Infant and maternal transfers, as noted previously, are quite low due to the availability of many services at HCHS. There was no reported neonatal or maternal mortality in this sample. This also is consistent with statistics nationwide and those in the literature for birth centers. NACC reports a neonatal death rate of 2.1/1000 (which compares favorably with a nationwide rate of 7.7/1000) and a maternal death rate of 0.

Episiotomies

Episiotomy is a surgical incision of the perineum to facilitate delivery of the fetal head. It is, according to Pritchard (1985, p. 347), the most commonly performed obstetrical surgery, aside from cutting the umbilical cord. This author, for example (1984), found that over a one year period in a private community hospital in Connecticut (which includes an Alternative Birth Room) episiotomies
were performed in nearly all primip deliveries, and in 87% of vaginal deliveries overall. Dunne (1984) quotes a figure of 80%. The risk to benefit ratio of episiotomy is reviewed in great detail by Thacker and Banta (1983), who conclude that although more research would be helpful there is no compelling evidence in the obstetrical literature to justify such a high rate of episiotomy. Since this intervention is one of those most commonly criticized by home and natural childbirth advocates, one might hope and expect to see a lower incidence of episiotomy in birthing centers in general (as is indeed borne out by Table 2 above) and in the HCHS population (as is borne out below.)

Table 13. Incidence of Episiotomy by Birth Location

<table>
<thead>
<tr>
<th>Location</th>
<th>Total patients</th>
<th>Epis</th>
<th>No Epis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>41</td>
<td>23 (56%)</td>
<td>18 (44%)</td>
</tr>
<tr>
<td>Transfers</td>
<td>22</td>
<td>13 (59%)</td>
<td>9 (41%)</td>
</tr>
<tr>
<td>Chose hospital</td>
<td>19</td>
<td>10 (53%)</td>
<td>9 (47%)</td>
</tr>
<tr>
<td>HCHS or home</td>
<td>180</td>
<td>35 (19%)</td>
<td>145 (81%)</td>
</tr>
</tbody>
</table>

Chi Square = 23.4, p < .0001

Table 13 shows that, while less than the rate at the Connecticut hospital cited above, the referral hospitals in the Happy Camp area also had a high rate of episiotomy, over 50%. One might have predicted that the referred patients, who presumably have a higher incidence of complications including large babies and abnormal labors, might need more episiotomies than the low-risk population delivering at HCHS. Interestingly enough, though, the patients who chose to give birth in the hospital had a very similar high rate of episiotomy. The clinic patients, in contrast, showed a 19% episiotomy rate. This compares well with the literature
(although somewhat higher than some centers where nurse-midwives are the primary practitioners), and is less than the hospital rate by a significant degree.

The advocates of episiotomy contend that episiotomy "substitutes a straight, neat surgical incision for the ragged laceration that otherwise frequently results" (Pritchard, 1985, p.347). Table 14 fails to substantiate this claim, however.

Table 14. Condition of Perineum-HCHS Deliveries*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intact perineum</td>
<td>65</td>
<td>(39%)</td>
</tr>
<tr>
<td>No epis-1st degree laceration</td>
<td>49</td>
<td>(29%)</td>
</tr>
<tr>
<td>No epis-2nd degree laceration</td>
<td>16</td>
<td>(10%)</td>
</tr>
<tr>
<td>No epis-3rd or 4th degree</td>
<td>0</td>
<td>(0%)</td>
</tr>
<tr>
<td>Episiotomies</td>
<td>37</td>
<td>(22%)</td>
</tr>
<tr>
<td>Epis-no extension</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Epis-1st degree extension</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Epis-2nd degree extension</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Epis-3rd degree extension+</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Epis-4th degree extension**</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

*Includes home births by HCHS physician.
+Includes 1 forceps birth. **Includes 1 precipitous birth.

Patients with no episiotomies in the clinic population had no resultant laceration nearly 40% of the time, and another 29% had only 1st degree (superficial) tears. There were no lacerations involving the rectum in the no episiotomy group, while 4 of the 37 patients who did have episiotomy (10%) had extensions involving the rectum.
DISCUSSION

The birthing program at Happy Camp Health Services, while sharing certain features in common with birth centers in the literature, is also unique in some ways.

I am doubtful that Dr. Vossen, clinic staff, and the community members who were all instrumental in beginning the birthing program had any intention of helping to shape what would become an important institution for the delivery of alternative obstetrical care in this country. More likely, they were simply perceiving the needs of a community and attempting to respond in a safe and practical way. Nevertheless, it is notable that HCHS designed a program which in most aspects anticipated the guidelines of APHA (not published until five years after the program began) and was, indeed, the first licensed birth center in the progressive state of California.

The isolated setting of Happy Camp presents a sort of geographic imperative to be creative in health care delivery, an imperative simply not found in New York City or Seattle. Many of the birth centers reporting in the literature were started in urban or suburban areas to cater to a small, select group of health care consumers. Other options were available in these areas, but none to precisely fill the niche taken up by these centers. In El Paso, Texas the dominant health care system, although present, was largely ignoring the needs of a segment of the population, and the birthing center there went to extraordinary means to meet these needs.

In Happy Camp in 1978, however, we see a situation in which the community was unable to provide any services to the childbearing population. This left consumers the option of traveling the 90
minutes to Yreka's community hospital, or the 150 minutes to Medford's tertiary care center, for their prenatal care and delivery; or alternatively to seek out lay midwives, possibly forgo prenatal care, in some cases even to forgo any birth attendant whatsoever in choosing a home birth.

Given the pragmatic realities of the geographic situation, there is little doubt that practitioners in Happy Camp are going to be a little more reluctant than their colleagues in New York City to refer a patient during the antepartum period. This may well at least partially explain the relatively low numbers of these transfers.

The intrapartum transfer rate at HCHS was also low compared to "controls" from the literature: 14% for the NACC study versus 6% for HCHS. This, I believe, is in large part due to the range of services available at HCHS compared to other centers. As noted previously, many centers do not allow pitocin augmentation of labor while HCHS does. Other centers are more likely to transfer for retained placentas or postpartum hemorrhage. Many do not utilize forceps. A rough calculation shows that perhaps a fifth of HCHS patients had a complication that might have been grounds for transfer elsewhere.

Some of these differences are practitioner-related, due to differences in skill and training. I would like to suggest, however, that politics plays a significant role here. Centers in well-served areas could well be viewed by some as superfluous and it is thus in their strong interest to avoid poor outcomes which might provide their opponents the "proof" they need to suppress this source of competition. Thus certain protocols may be designed, knowing that the transfer rate will thereby be increased, but in the interest of
survival of the center.

Such political concerns, though certainly present to some degree anywhere, may be viewed as a bit of a luxury in the Happy Camp context. The HCHS birth center is in no sense superfluous; it is the only local option for childbearing families who wish to remain within the dominant medical system. In this context it is all the more impressive that the outcomes at HCHS were so very comparable to other centers. Infant birthweights, felt by some to be an indirect measure of effectiveness of prenatal care, were comparable to "controls" with low incidences of high and low-birthweights. Apgar scores are similarly comparable, although the limitations of this measure as an outcome variable have been mentioned. And fortunately, there has been no known maternal or neonatal mortality in this group.
CONCLUSIONS

It is apparent that birth, while primarily a medical and psychosocial event, is also a political event in our society. The swing toward in-hospital, medicated, technological birth of the 1940's and '50's was followed by a swing back to emphasizing the individual, psychosocial, "natural," aspects of childbirth in the 1970's. A small but vocal minority of natural childbirth advocates seceded from the medical care system, choosing home birth. A series of battles ensued between the two extreme ends of the birthing spectrum, the homebirthers and the obstetrical community. Out of these battles came two important realizations.

The first realization was that home births are very likely safe, or at least that the medical system could be altered in only minor ways to allow home births to be safe. The unwillingness of the medical system to cooperate with scientific studies of the safety issue (in regards to birthing centers as well as home birth) has limited the types of studies that can be done, but it is fair to state that while home birth entails certain risks by its very nature, many of the significant risks for homebirthers have been related to the medical systems' effective segregation of homebirth right out of the system. This has left many homebirthers with a choice of do-it-yourself homebirth or attendance by lay practitoners with varying levels of skill, training, and access to the larger system. The flip side of the risks of home birth, less often explored, are the risks of hospital births which have consistently been shown to include higher rates of analgesia, instrumentation, episiotomy, and the like. And this data does not even consider the
psychosocial impact of giving birth in an unfamiliar setting where the role of "patient" tends to promote feelings of powerlessness and loss of identity.

So in an ideal system, home birth could be a safe and realistic alternative for a large number of women. This actually occurred for many years in the Dutch system, where until very recently 30-50% of births were attended at home by state-sanctioned midwives (see Damstra-Wijmenga, 1984; Limburg, 1984; Kloosterman, 1978 & 1985). But the second realization was that in the United States, in the 1970's and '80's, the political opposition to home birth was just too strong for this option to be appealing or even available to a large segment of the population. Thus, when MCA set out, in 1972, to explore ways of meeting the needs of the evolving childbearing population, they considered reviving their home birth service of years before; but they ultimately realized that a new intermediate option, more homogeneous than home but more "homey" than the hospital, was needed.

The freestanding birth center, therefore, by its very origins and nature is a compromise, a sort of medical and psychosocial juggling act. How much hominess can be included without alienating the medical community, how much technological intervention can be included and still qualify as natural childbirth? These concerns were relevant to Dr. Vossen in Happy Camp, and both of these sides are reflected in his description of the program's founding.

In evaluating any compromise, one must examine both losses and gains. Surely, as Katz-Rothman notes (1983), there is indeed a loss in moving birth out of the home. Despite all the best efforts and
intentions of designers and practitioners of birthing centers to create a personalized, home-like atmosphere where a woman's identity, desires, and power will be enhanced, no environment can match one's own for engendering one's control, power, and authority. I read arguments for home rather than hospital that spoke about privacy. For me it was less a question of privacy and more a question of authority. At home, nobody was coming in the door whom I did not choose to have come in. One doctor alone or a dozen assistants—they would all be there because I personally hired them, and I personally could tell any one of them to leave (Katz-Rothman, 1982).

Significant gains have been made through the existence of freestanding birth centers as well. Difficult to measure, but undoubtedly true, the presence of birth centers has in some ways changed birth for all women, regardless of setting. The presence of in-hospital alternatives, whose usefulness as a true alternative is debatable, is at least a sign that perhaps the obstetricians and the hospitals are starting to get the message. Again, as Katz-Rothman mentions, birthing centers serve a useful function by providing a workshop for CNMs (comparable to the home for "granny" midwives or the hospital for physicians) which is hopefully helping to establish the legitimacy of these client-centered practitioners who are trying so sincerely to synthesize the best of the old and the new. For physicians, like Drs. Vossen and Sweeney, birth centers provide a way to give community-based care consistent with ideals of natural childbirth, while still remaining connected with and supported by the medical system at-large (on whom they and their patients must, at times, be highly dependent).

The U.S. medical system is in a constant state of flux, and this is true in the area of childbirth as well. As the birth rate
remains low, and hospital revenues increase, marketing of healthcare services becomes more and more prevalent. The San Francisco Bay area, for example, had a recent media war among hospital obstetrical services highlighted by full-page newspaper advertisements for the private rooms, birthing rooms, labor delivery recovery (LDR) rooms, gourmet cuisine and the like! New invasive technologies, such as amniocentesis, are changing pregnant women's perceptions of themselves and their babies (see Katz-Rothman, 1986). We are seeing a new generation of consumers of childbirth services who seem more focused on the ends than the means of the birthing process: they want their "perfect child," and such non-natural means as embryo transfers or surrogate mothering are perfectly acceptable. One can only speculate about the consequences of this trend for childbearing centers.

Birthing centers survived their early years during which time their fight for legitimacy required lobbying third-party-payers to cover their services. This fight was by-and-large successful, but the latest battle is over malpractice for centers and practitioners. CNMs only recently renegotiated for malpractice insurance when their carrier cancelled unexpectedly. At the time of this writing, HCHS has had their malpractice insurance cancelled. Although it appears that a replacement carrier will be found, there were fears that the birthing program might be forced to close. As more and more birth centers open, still some are forced to close. An example of this comes close to home. The CNMs affiliated with Yale's Graduate School of Nursing just last year were forced to close their Family Childbirth Center after less than two stormy years. Here again
politics was the crucial factor, as obstetricians who had committed support to the center were forced by pressure from colleagues to withdraw.

In summary, then, the birthing center has been shown (within the limits of available research strategies) to be a safe, well-accepted alternative to hospital-based obstetrical care. Although certainly not the last word, they are a significant factor in helping the medical system to not lose sight of the human side of health care while pursuing the technological side.
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