



July 25, 2003

David Hyman, JD
Department of Justice
Robert F. Kennedy Building
10th St. and Constitution Ave., NW
Washington, DC 20530

Attention: Federal Trade Commission and Department
of Justice Hearings on Health Care and Competition

Dear Mr. Hyman:

Enclosed is the American College of Nurse-Midwives Addendum of case studies, newspaper releases, and ACNM release that was submitted via e-mail today. Also enclosed are articles which we were unable to send by e-mail.

It has been a pleasure to work with you and the Department.

Sincerely,

Karen S. Fennell, RN, MS
Senior Policy Analyst



July 25, 2003

Attention: Federal Trade Commission and
Department of Justice Hearings on
Health Care and Competition

Addendum of cases and articles for statement of Lynne Loeffler, CNM, JD
for the American College of Nurse-Midwives
(original statement presented June 10, 2003)

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ACNM Testimony/Case Study A: Austin, Texas

In April 2002, within three weeks of each other, the only two Austin-based nurse-midwifery practices that provided hospital deliveries were terminated. The termination appears to have been the result of collusive action and/or intimidation by local obstetrician/gynecologists (hereafter “OB/GYN” or “OB”). One group of three CNMs (which included Ms. Loeffler, ACNM’s witness at the June 10 hearing) was employed by Seton Healthcare Network. Seton, which probably has at least a 65% share of the local L & D beds, hired the CNMs to staff a hospital-based indigent care service at Brackenridge Hospital, a facility which Seton leases from the City of Austin. This group will be referred to as “the Brackenridge CNMs.” The other group of three CNMs were employed by a private OB/GYN practice, Women Partners in Health, which provided obstetric and midwifery services at another local Seton-owned hospital. This group will be referred to as “the WPIH CNMs.”

The termination of these practices was reported to the U.S. Department of Justice’s Dallas office and subsequently to staff attorneys in the DOJ Antitrust Division in D.C., as well as to the Texas Attorney General’s Office, by representatives of a local consumer organization, Texans for Midwifery (“TFM”). Subsequently, several newspaper articles revealed the existence of an investigation by the state Attorney General’s Office. Articles from the *Austin American-Statesman*, the *Dallas Morning News*, and the Texas Associated Press wire are attached to these case studies.¹

The three Brackenridge CNMs (Susan Wentz, CNM, Dr.PH, Lynne Loeffler, CNM, JD, and Sandra Gale, CNM) were recruited by Sister Patricia Elder, the Chair of Seton’s Board of Directors (“Sister Pat”), to provide full-scope (prenatal through delivery through postnatal) care for the Medicaid, indigent, and uninsured patient population traditionally served by the hospital. Ms. Wentz, who had directed a large CNM service at Baylor University Hospital in Houston for over twenty years, was personally recruited by Sister Pat to develop a CNM service, which she planned to grow to at least six CNMs and, ultimately, to replace an existing family practice residency program. The residents, under supervision of local OB/GYNs, provided labor and delivery services, but no prenatal care, for this patient population. Sister Pat and the hospital administration believed that the residency program offered less than optimal care for these patients and should be replaced with one that would provide continuity of care under one group of providers from the prenatal period through childbirth and postpartum care.

Seton assigned eight OB/GYNs, who already contracted with Seton to serve as supervising faculty in the residency program, to provide consultation and collaboration for the CNMs and to accept referrals from the CNMs as needed. Under Seton’s medical staff bylaws and OB Dept. rules, however, CNMs may not obtain or exercise clinical privileges unless “sponsored” by an OB/GYN. “Sponsorship” at these hospitals involves much more than consultation, collaboration and referral in that the “sponsoring” physician must accept responsibility for the actions of the

¹Because this case has received a great deal of publicity in the local press, including disclosure of the existence of a state antitrust investigation, we have identified the city and used the actual name of midwives, the hospital, and hospital chain. Names and cities have not been disclosed in most of the other case studies.

CNM in the hospital and must also be physically present in the hospital during the entire labor and delivery of CNM-attended patients. Note that this requirement was developed and imposed by the Seton/Brackenridge medical staff and its OB/GYN Department, not by the hospital board or administration. At Brackenridge, one of the eight physicians was in-house at all times anyway in order to supervise the residents so no extra burden was imposed on them. They were also able to bill for any procedures provided as consultants to the CNMs. Nevertheless, these OB/GYNs opposed the hiring of the CNMs and appear to have conspired among themselves to discredit and, eventually, eliminate the midwifery practice.

In February 2002, Seton and Brackenridge informed the physicians that, regardless of their opposition, the CNM practice would be continued. In late March, during a meeting with Ms. Wentz, seven of the eight OBs demanded that each of them be paid an annual stipend of \$60,000 in exchange for their continuing availability as sponsors (the eighth was the department chair, who was late for the meeting). Please note that these OBs are neither hospital employees nor members of a single group practice. Rather, each OB functioned vis-a-vis the CNMs as an independent contractor pursuant to an individual contract between each physician and Seton. The OBs told Ms. Wentz that they had previously discussed this demand among themselves and had agreed on the amount prior, \$60,000 per physician, prior to the meeting. Ms. Wentz informed them that she would not (and could not afford to) pay the stipend. Later that day, she reported the demand to the hospital administration which, we believe, also declined to pay the stipend.

Approximately three weeks later, at an April 11, 2002 meeting of Seton administrators, the OBs, and the CNMs, the OB/GYNs announced their decision to terminate their sponsorship of the Brackenridge CNMs. Ms. Wentz stated to the OBs, in the hearing of all meeting attendees, her belief that, had she or the hospital agreed to pay the stipend, the physicians would have continued their sponsorship of the CNMs. None of the obstetricians denied this accusation and no Seton administrator contradicted her. Brackenridge began interviewing other local OBs in order to find replacement physician sponsors. One of those interviewed was the senior OB partner in the WPIH OB group, which already employed three CNMs.

At some time between April 11 and April 24, a conversation occurred between the chair of the Brackenridge OB/GYN Department and the senior OB partner in the WPIH OB/GYN group. It is not known what was said in that conversation, only that it occurred. Subsequently, on April 24, WPIH notified its employee CNMs that their employment would also be terminated, effective December 31, 2002 which, in fact, happened.

At the present time, no hospital in Austin grants clinical privileges to nurse-midwives except through the "sponsorship" of a physician and, as a result of this restriction, no nurse-midwife has clinical privileges at any Austin hospital. Several of the terminated CNMs are attempting to open independent practices in Austin, with local OBs who have expressed interest in working with them on a collaborative (non-employee) basis, but these practices and collaborative relationships have so far been stymied by the physician sponsorship requirements at the Seton hospitals.

ACNM Testimony/Case Study B: Another Texas City²

Summary. Six general acute-care hospitals in this city provide labor and delivery services, but CNM practice is permitted at only one, the city-owned hospital, where privileges are effectively limited to CNMs who are “sponsored” by a staff OB. As in Austin, the OB staff consists almost entirely of OB/GYN medical school faculty who supervise residents and medical students. The facts presently known indicate the existence of two (probably related) conspiracies. The first involves physicians who practice at the local private hospitals, a majority of whom have repeatedly agreed among themselves to prevent or restrict access to those hospitals by all CNMs, whether employed by physicians or in independent practice. Evidence also exists of a second collusive agreement, which involves a demand for a stipend in exchange for “sponsorship” of CNMs at the city hospital and exclusion of any independent CNM who refuses to pay. There is some overlap in identity of the physicians involved in the two situations. There is also evidence that one OB (who figures prominently in both situations) was also involved in exchanging information with one or more of the OBs at Brackenridge Hospital in Austin regarding methods for restricting CNM practice and the amount stipend to be charged for the stipend.

The City Hospital. Until approximately two years ago, CNMs in private practice or employed by local non-profit clinics had access to clinical privileges at the city-owned hospital, which is staffed by faculty members from a state medical school. These “community” CNMs were required by department policies to be “sponsored” by an OB/GYN who had privileges at the hospital. “Sponsorship” here means the OB admits the CNM’s patients in his name and must accept full responsibility and liability for the CNM’s actions, but in-house presence is not required. As in Austin, the OB faculty is obligated by contract to provide 24/7 in-house supervision of medical students and residents and in-house coverage of labor and delivery. If called upon to provide consultation or accept referral of a CNM patient, the faculty member bills individually for those services. Total annual referrals to department members from the community midwives has been estimated in the range of \$ 500,000. In June, 2001, the OB/GYN Department notified the hospital and the CNMs that a stipend of \$60,000 would be charged for the Department’s continued willingness to “sponsor” privileges for community midwives. Each individually-practicing CNM would be required to pay a minimum of \$10,000. The CNMs and the hospital declined to pay a stipend, citing concerns that such payments might be construed as kickbacks, since no additional services would be provided in return for the payments. One of the local CNMs in question owned a birth center; the others either worked at a local non-profit clinic or had a home birth practice. Two of these independent CNMs (identified here as Midwife A and Midwife B) sought out other OBs to provide sponsorship, but their choices were limited because of hostility from OB faculty members to non-faculty physicians. One physician, Dr. N, initially agreed to collaborate with Midwife B, but informed her two days later that he had been advised by other OBs that he should not “sponsor” any midwives unless he was paid a \$10,000 stipend. When she declined to pay, he refused to provide sponsorship. Both CNMs currently have collaboration arrangements with another OB/GYN, Dr. C, but he does not practice at the city hospital, so they both lack privileges at any area hospital.

²Names and details of this case are being withheld to protect a nonpublic government antitrust investigation that is still in its preliminary stages

Private hospitals. Since no private hospital in this city grants privileges to CNMs, Midwives A and B must transfer all patients who require or desire a hospital delivery to the care of Dr. C. Two of these private hospitals are owned by Columbia HCA and two are owned by Tenet (please note that other hospitals in both chains grant privileges to CNMs). The fifth hospital is owned by a group of local physicians, but its labor and delivery service has been closed.

In March 2002, the administrator of one of the Columbia HCA hospitals informed that Dr. V that the hospital's administration and board wanted to offer privileges to CNMs, based upon a determination that doing so would benefit the hospital financially and would also provide a public health benefit to the community. He gave Dr. C a set of (never-before-seen) department policies that would permit CNM practice. Dr. C, together with a female OB (Dr. D) and the CNMs, wish to open a group practice that would provide continuity of care for Medicaid and uninsured patients in competition with the city hospital faculty group, as well as care for private patients. Both CNMs submitted written requests for privilege applications, but no applications were ever provided. Shortly thereafter, the OB/GYN Department Chair (who had previously chaired the city hospital OB Dept.) substantially changed the pro-CNM policies. His amended policies required a "sponsoring" physician to be physically present in-house during the labor and delivery of CNM patients. When Dr. C questioned the basis for this in-house policy, the OB Department Chair stated that he had consulted with "some friends in Austin" to find out "how they treat their nurse-midwives."³

Dr. D has tried for several years to amend anti-CNM medical staff policies and bylaws at one of the two Tenet hospitals, but these were opposed by every other member of the OB/GYN department except Dr. C. Opponents circulated a letter throughout both Tenet OB Departments denouncing physicians who worked with CNMs. The author of this letter accused Dr. C of "taking the bread from the mouths" of the children of his fellow OBs and Dr. D, who is a solo practitioner, was threatened with expulsion from the "call group" of OBs to which she belonged. As a result, her efforts to open the OB department failed. Last month, an attempt to open the OB Department to CNMs at the other Tenet hospital was rejected by a large majority of the OBs.

Aftermath. Midwife A (as a direct result of financial losses due to her inability to admit patients for hospital deliveries when needed or preferred by the patient), will close her birth center in August 2003. Midwife B is working for Planned Parenthood and looking for a position out of town. These two are the most recent casualties of approximately 30 CNMs who have left town or quit midwifery practice because of the refusal of the OBs in this city to permit any local hospital to grant clinical privileges to CNMs.

Two federal government-funded studies assessing prenatal care in this city indicate that an extremely high percentage of women (over 40%) lack access to adequate prenatal care. Many indigent or uninsured women in this area receive no prenatal care at all; they simply present in labor at hospital emergency rooms, to be delivered by residents or the OB on call. This situation could be greatly alleviated if CNMs were allowed to practice in local hospitals.

³At approximately the same period of time (March-April 2002), the Austin physicians made their demand for \$60,000 stipends.

ACNM Testimony/Case Study C: Des Moines, Iowa

Summary: This case study demonstrates the intersection of private restrictions with barriers to practice attributable to government regulation. CNMs in Iowa would be considered Licensed Independent Practitioners by JCAHO because the state practice law does not require physician supervision. Most CNMs, however, are employed by hospitals or physician groups. Only five or six CNMs in the state are in independent practice. Iowa law requires certificate of need for birth centers (but not for ambulatory surgery centers). One freestanding birth center is located in Davenport. A second birth center applied for a certificate of need to open in Des Moines. None of the hospitals in Des Moines grant privileges to independent CNMs. Rather, department policies at all local hospitals require physician “sponsorship,” which means that the physician must admit all patients, sign all charts, and accept legal responsibility for all CNM actions. CNMs who are in independent practice must be sponsored by not one but two OBs. Only one OB in Des Moines is willing to collaborate with and “sponsor” independently-practicing CNMs.

Background Facts: The Des Moines birth center, Almost Home, is a non-profit which intends to operate on an open-staff model, which means that all area CNMs and OBs will be eligible for credentialing. Its president and clinical director, Carey Ann Ryan, CNM, has had a home birth practice for the past several years. She has been unable to obtain clinical privileges at any local hospital because she provides home birth services and does not have two sponsoring physicians. The State Health Facilities Council, after a day-long hearing in March 2003 at which consumers, other CNMs, and several physicians testified about the high level of demand for a birth center in Des Moines, denied CON. The stated reason for the denial was because the center lacked a formal transfer agreement with any Des Moines-area hospital. Despite repeated requests, no Des Moines hospital has been willing to enter into a transfer agreement with Almost Home.

At least three other Des Moines CNMs wish to become credentialed at Almost Home Birth Center. Two of these CNMs manage a non-profit inner city clinic which provides prenatal and childbirth services for indigent and uninsured patients. Patient populations served by the independent include several minority groups, whose members’ cultural practices are incompatible with receiving OB/GYN services from male physicians. Significant Amish, Mennonite, and Islamic populations in the area prefer midwifery care and home birth. Home birth and birth center patients may experience delay in care or lack of continuity of care if their health care providers are able to admit patients to hospitals if complications arise, so the lack of clinical privileges for CNMs and a transfer agreement for the birth center ultimately hurts consumers, not just providers. None of the Des Moines hospitals has been willing to enter into a transfer agreement with home birth practitioners or with the new birth center.

At the CON hearing, the only witness to testify against the center was an attorney for two of the Des Moines hospitals, who urged denial of CON because the birth center did not have a transfer agreement with any local hospital. Both these hospitals had, in fact, refused to execute a transfer agreement with Almost Home. The reason for this refusal, the CON panel was told, was because its clinical director did not have clinical privileges to practice at its hospitals. The Council voted 4-1 to deny CON, and told Ms. Ryan that if she could work out a transfer agreement with the hospitals, CON would be granted in the future.

Aftermath/present situation: The other independent CNMs, including the two who work at the inner city clinic, will lose their hospital privileges in September 2003, because one of their two sponsoring physicians has notified them that he will withdraw his sponsorship by that time. One of the hospitals convened an ad hoc committee of OB and CNMs to study amendment of the restrictive rules but, on May 19, 2003, the OBs voted to retain the two-physician rule and other restrictions on CNM practice. Nurse-midwives present at the meeting inquired whether any department members would be willing to provide sponsorship under those conditions; they received no response. On June 20, two Des Moines hospitals, without explanation and contrary to their previous position, executed a transfer agreement with Almost Home. Apparently as a direct result of this development, CON for the center was granted on July 12, 2003. At the present time, there is no prospect that the restrictive hospital bylaws will be relaxed. As a result, by September 2003, the only site where independent CNMs will be able to deliver babies in Des Moines will be Almost Home Birth Center.

ACNM Testimony/Case Study D: A City in Florida

Summary: This case, another clinical privileges denial, involves a large CNM-owned group practice, which employs several obstetricians as well as CNMs. The CNM practice is a long-standing one and has been quite successful: its members have privileges at the city-owned hospital and the county has awarded its Medicaid/indigent care contract to this practice for the past several years. Nevertheless, even though the practice employs its own physicians, its CNMs have been denied privileges at two local private hospitals as a direct result of the actions of OB/GYNs who dominate the OB Departments at both hospitals.

Background Facts: Hospital A is a member of a consortium⁴ of several private non-profit hospitals that have apparently unified certain functions, such as joint buying. Newspaper and Internet research indicates that the consortium also negotiates with managed care plans on behalf of its members. We are not aware whether or not the consortium obtained a favorable business review letter from the state A.G., the FTC, or DOJ. Two members of the consortium (not Hospital A) entered into a consent decree with U.S. DOJ and the Florida A.G. a few years ago after having engaged in joint negotiations and attempted a *de facto* merger. Although every other hospital in the consortium grants privileges to CNMs without restrictions, Hospital A's OB Department has refused to change its anti-CNM policies. These policies require physician sponsorship and in-house supervision of CNMs.

Hospital B has identical requirements for physician supervision of all advanced practice nurses. The wording of its sponsorship agreement is identical to that of Hospital A, and there is considerable overlap between their respective OB departments. Its OB Department voted in March 2003 to continue to bar CNMs from obtaining privileges to deliver babies, although CNMs would be permitted to function as nurse practitioners without labor or delivery privileges under physician sponsorship. This hospital is under common ownership with other local hospitals which grant privileges to CNMs without these restrictions. These other hospitals, however, are not dominated by the same local OB practices as Hospital B.

Several large OB group practices, one of which lost the county Medicaid contract to the CNM group, dominate the OB Departments at both hospitals. These physician groups belong to an IPA-type "Alliance" of OB group practices in this area. The Alliance provides billing services for its members, who constitute a significant majority of area OB/GYNs (solo practitioners and small partnerships are barred). It is unclear what other services the Alliance provides for its members, who have led the campaign to deny non-sponsored privileges to CNMs at both hospitals.

This physician in-house requirement would be so economically burdensome for the CNM group that it would no longer be able to service the Medicaid contract. Neither Medicaid nor private

⁴Research by counsel for the CNM group has not lead to any information regarding whether the consortium obtained clearance or a business review letter by the Commission, the Division, or the State A.G.'s office, but we assume that the consortium would not be operating without having done so.

managed care plans who insure the group's private patients would pay for two providers to provide a service which either could legally provide alone. The CNM group has protested the restrictions and is attempting, through its attorney, to negotiate with both hospitals.

The Chief Operating Officer of Hospital A has informed the president of the CNM group that the hospital administration and board really want CNMs on staff and do not support the OB-imposed restrictions, but the board is afraid to antagonize its medical staff. Hospital A appointed a new ad hoc committee, composed of staff physicians who are not OB/GYNs, to review the situation and take more testimony. The CNMs do not expect these other medical staff members to override the OBs' decision to restrict CNM practice. The administration of Hospital B has also sent "back channel" messages that it wants this CNM group to bring its lucrative Medicaid contract practice there and views County patients as a significant source of new business. It, too, however, is apparently unwilling to publicly oppose the restrictions imposed by of its OB/GYNs, particularly the larger groups that belong to the Alliance. One of these groups vied with the CNMs for the county contract, but declined to submit a bid because it would not accept the payment rates the CNMs were willing to accept from the County. The County, which has won national recognition for the quality and efficiency of its provision of health care services for the indigent, is in the process of building a new clinic in close proximity to Hospital B, and wants the CNMs to admit county patients there. Hospital B's administration told County representatives that it wants the business but is unwilling to offend powerful members of its medical staff.

Present situation: Counsel for the CNM group has contacted the Florida Attorney General to request an investigation of this situation. An assistant A.G. has been assigned to the matter.

ACNM Testimony/Case Study E: A Small City in New Mexico

Background: A CNM, whose husband is a member of the medical staff of the only hospital in this small city in New Mexico, opened a birth center there two years ago. The birth center is located about one block from the hospital's driveway, but the CNM has been denied clinical privileges at the hospital because she does not have a collaborating physician on the medical staff. A single physician group, which provides all OB/GYN services in this town and controls the hospital's OB Department, has refused to collaborate with her. This group has developed policies that deny admitting privileges to CNMs and which require physician "sponsorship" which means signing all CNM charts, performing the admission history and physical for all CNM patients, and assuming liability for CNM malpractice claims.

A University of New Mexico ("UNM") residency program is located at this hospital to train family practice residents in obstetrics. Since New Mexico lacks sufficient numbers of specialist physicians in rural areas and small towns, it has embarked upon a University-sponsored program to train family practice physicians in obstetrics and, ultimately, to place them in medically-underserved communities. The UNM OB-faculty member who directs the residency program is willing to collaborate with this CNM, but has been concerned that he will be retaliated against by the other OBs if he does so. The hospital administrator recently informed the CNM that it is trying to recruit new OBs to the community who are more CNM-friendly. He has also indicated the hospital's interest in acquiring her birth center and contracting with her to manage it. The only roadblock has been the monopoly OB group that controls the OB department claims. The leader of this group had previously informed the director of the residency program that members of the group will not accept referrals or provide other backup services for the residency program if he collaborates in any way with this CNM or the birth center.

Present Status: Matters are presently at an impasse. The CNM has had several meetings with administration, which claims it is trying to recruit new OBs. One of the members of the monopoly OB group has indicated he may break ranks with his partners and the hospital has supposedly pressured the group to drop its threat against the residency program. The birth center, however, is losing money because it must refer all patients who require or desire hospital deliveries to the monopoly group, and may be unable to remain open much longer.

ACNM Testimony/Case Study F: New York-Presbyterian Hospital, New York, New York

Present Situation: This practice situation is still in evolution regarding what the hospital will decide is the final fate of this nurse-midwifery practice, which is over 20 years old. The 28 nurse-midwives serve primarily a Medicaid population and a Latino population.

Attached in an addendum is the press coverage of the impending closure of the practice.

ADDENDUM

ACNM Testimony/Case Study A: Austin, Texas

Newspaper Releases

Coalition for Nurses in Advanced Practice

Midwifery programs are closing

Hospitals' decisions leave moms-to-be with fewer birth options

By Mary Ann Roser

AMERICAN-STATESMAN STAFF

Tuesday, May 14, 2002

Women who want midwives to deliver their babies at Brackenridge Hospital no longer have that option, and Austin's only other hospital midwife program will close by year's end.

The canceled programs at Brackenridge and Seton Medical Center will affect hundreds of women who wish to have natural childbirths each year. Many women Monday were upset by the news, particularly the abrupt end to Brackenridge's program last week.

The closings, although not related, are being done for a similar reason: Midwife deliveries are not big moneymakers, people associated with the programs said.

"There's a vacuum now in Austin," said Christy Verdict, who delivered her first baby with the help of a midwife March 29 at Brackenridge and hoped to have future births there. "I think of Austin as so open and tolerant. It doesn't make sense not to have this option."

After the Seton program closes Dec. 31, midwives won't deliver babies in any Austin hospital unless something unforeseen happens.

"We're talking about a huge change in the birthing landscape in Austin," said Bridget Brown, who teaches childbirth classes and works closely with midwives.

Women of all backgrounds choose to have natural childbirths with midwife assistance in a hospital instead of at home because they feel safer in a hospital setting in case complications develop, Brown and others said.

Seton Healthcare Network, which operates Brackenridge, recently told the three midwives at Brackenridge that it would end the program July 15.

The midwives expected to continue delivering babies until July, and they notified their patients of that. But the midwives learned last week that Wednesday would be their last day to deliver babies at Brackenridge. They then called their patients.

A woman who went into labor Thursday was devastated that her baby would not be delivered by the midwife who had taken care of her throughout her pregnancy, Brown said. Instead, an obstetrician handled her labor and delivery at Brackenridge.

A Brackenridge midwife said she and her colleagues could not discuss the program's sudden demise.

Travis Froehlich, a Seton network vice president, said he didn't know what prompted the abrupt end to the Brackenridge program. He said he would try to find out, but he did not call back.

Since the Brackenridge program started in October 2000, midwives had delivered about 475 babies, Froehlich said. Program losses were \$200,000 in the past year, making it no longer viable, he said.

Froehlich said the losses represented the difference in the costs of the program, including salaries, office space and staff, and what the midwives were paid for the care they provided. Seton, as the manager of Brackenridge, had to underwrite that cost, he said.

Many of the women who have babies at Brackenridge are on Medicaid, a state health program that "doesn't pay a

lot" to cover deliveries, Froehlich added.

"You have to have a very high volume of patients," and "that may not be consistent with a midwifery practice," he said.

Midwives generally stay at a woman's bedside throughout her labor, unlike physicians who are in and out of a patient's room, midwives and their patients said.

Seton is not canceling the midwife program at Seton Medical Center. Rather, obstetricians who practice with the midwives at Women Partners in Health are ending their sponsorship of the program at Seton.

"Midwives are not real moneymaking machines," said Mary Barnett, one of three midwives at Women Partners in Health.

Barnett and another midwife, Melanie Benson, said they are not sure what they will do when the program ends.

The Seton program has been around more than six years, and the midwives have handled 1,256 births at the medical center, Barnett said.

"It's really going to limit the options for the community, unless another physicians group wants to start working with a midwifery service," Barnett said.

She and Benson did not know of another group.

Until the program ends at Seton Medical Center, the midwives in the partnership can take some of the Brackenridge clients, but they are not accepting new patients on Medicaid, Barnett said.

Karen Walker of Austin, who had been seeing the midwives at Brackenridge, said she was all set to have her first baby with the midwives there in June but has since been told that won't happen. Her first appointment with the Seton midwives is today.

She is concerned about what will happen when it's time for a second baby.



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Midwives on the Move

BY [LAURI APPLE](#)

June 28, 2002:



Texans for Midwifery crowded the BHOC
Thursday night.

photo by John Anderson

A standing-room only crowd -- including many babes-in-arms wearing stickers reading "I Midwives" -- showed up to the **Brackenridge Hospital Oversight Council's** meeting June 20 to urge the council to prevent the complete disappearance of midwifery services from Austin hospitals. Faced with service cancellations at Brack and Seton Medical Center, local midwives and their supporters worry that Austin women are losing birthing options at a time when the number of available doctors is decreasing and the birth rate is rising.

"Why is Austin's only public hospital cutting yet another service to Austin women?" midwife consumer **Amy Chamberlain** asked. Along with other Austin mothers, midwives, and midwifery supporters, Chamberlain has formed a local chapter of the statewide **Texans for Midwifery**, a consumers support group. Chapter members coalesced in the wake of last month's announcement by **Capital Obstetrics and**

Gynecology Associates -- the faculty physician practice that sponsored three certified nurse-midwives at Brackenridge during an 20-month trial period -- that it wouldn't renew its sponsorship. According to officials at **Seton Healthcare Network**, the Catholic nonprofit that manages Brack and runs several other local hospitals, the program was losing money. And Women Partners in Health will end its six-year-old program at Seton Medical Center in December, also due to financial reasons.

The midwives at Brack will remain on staff until July 15 to provide prenatal care; their attorney, **Susan Jenkins**, says negotiations with Seton are ongoing, and no lawsuits have been filed. Last month, Jenkins released a statement on behalf of the midwives indicating their "complete surprise" at the doctors' decision to end sponsorship. The doctors took over all deliveries immediately upon announcing their decision, and although the midwives -- who delivered 475 babies during their tenure -- hastened to notify their patients of the policy change, they missed one pregnant woman. "We wish that hadn't happened," said Seton's Ed Berger, apologizing to BHOC Chair Dr. Jim Brand and Donna Ammons, the only members at the meeting. Berger and other Seton officials reiterated that it wasn't Seton's decision to end midwifery services, but that of the doctors themselves -- yet Capital Ob/Gyn is part of Seton's own medical and education program.

The Brack midwives could have their clinical privileges renewed if they find new physician-sponsors, says **Michael Regier**, Seton's vice-president for legal affairs and general counsel. "I think we're supportive of midwifery," he said. Finding sponsoring physicians, however, is the midwives' responsibility, and TfM believes "there's little if no chance" that will happen, in part due to a Seton policy requiring a doctor to be present when a midwife's patient goes into labor or delivers. If the midwife program at Brack was losing money, says TfM, it may be because of this rule, which makes it economically unfeasible for physicians even to collaborate with the midwives.

"Midwifery isn't a money-making proposition, but it's not a money-losing proposition, either," Chamberlain said. TfM believes doctors should serve as backup for midwives on an as-needed basis, and wants Seton to change its in-house doctor requirement; the group says 23 other major hospitals in Texas have no such policy. They also want Seton to let midwives practice as *non-sponsored*, or independent, Allied Health Professionals under its medical staff bylaws. The group is in the process of acquiring bylaws from other hospitals, Chamberlain says, "to make it easier for Seton to change theirs. They won't have to invent new language -- other hospitals will provide the models."

Many TfM members who spoke Thursday clearly doubt Seton's overall commitment to women's reproductive health -- and not only because of the midwifery issue. Fresh in their minds is the recent ordeal regarding the city's new "hospital within a hospital" on Brack's fifth floor. The hospital, eventually approved by the City Council, is the city's response to Seton's announcement last summer that it could no longer permit common reproductive services prohibited by Catholic Ethical and Religious Directives. "Who decided this [for] the citizens?" asked local midwife consumer Natalie Uzoff-Galletti about the cancellation of midwifery at Brack. "Brackenridge is my hospital -- the city's hospital. Citizens should have a say in what gets added or subtracted."

Dr. Brand recommended that midwife supporters express their concerns to City Council. TFM hopes that bylaws written for the new "hospital within a hospital," due to open next year, will recognize midwives as licensed independent practitioners. But **John Gilvar** of the Austin/Travis County Community Health Centers says midwifery at the new hospital hasn't been discussed, and whether it's feasible remains uncertain. "The ability of some hospitals to provide certain services depends to an extent on being subsidized by insurance," he said. "Since the new hospital would be treating uninsured patients, we wouldn't have the advantage of private insurers taking over some of the load."

While the number of deliveries at Brackenridge is growing rapidly, so is the crisis in providers for patients without private insurance. Not only are fewer ob/gyns delivering babies in public hospitals because of malpractice insurance rates, but more doctors are limiting the number of publicly insured patients they can afford to accept. Yet studies by the Centers for Disease Control and the National Center for Health Statistics show that deliveries by nurse-midwives result in fewer malpractice suits, as well as lower costs, lower infant mortality and caesarian rates, and higher birth-weights. Says Chamberlain, "It is a bad time to be discriminating against midwives."

TFM will hold a picnic and rally on Saturday, July 13, 10am-noon at Waterloo Park, to support midwifery in Austin. For info, call 419-7406.

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Austinites rally to revive local midwife programs

DATE: July 14, 2002

PUBLICATION: Austin American-Statesman (TX)

SECTION: Metro/State

More than 200 people rallied downtown Saturday for the return of midwifery services at local hospitals. Sloan Holley, 7, and others march down East 15th Street to Brackenridge Hospital, which abruptly ended its program in May. The rally was organized by Texans for Midwifery.

Tree Dewey, left, signs a petition in support of midwifery services at local hospitals during the rally Saturday. Dewey, whose second child is due in August, plans to give birth at home with the same **midwife** who delivered her son, Logan Quirk, 7. Asher Loewenstern, above, who was delivered three months ago with the help of a **midwife** at **Seton** Medical Center, sleeps through the rally but shows his support with a sign on his carrier.

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Midwife programs subject of inquiry

State attorney general looking into possible antitrust violations

BYLINE: David Pasztor, AMERICAN-STATESMAN STAFF

DATE: August 3, 2002

PUBLICATION: Austin American-Statesman (TX)

SECTION: News

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Almost three months ago, doctors at Brackenridge Hospital and **Seton** Medical Center decided to end the only two programs in Austin that allowed midwives to deliver babies in local hospitals.

Now, the state attorney general's office is investigating possible antitrust violations "in the provision of obstetrical services by nurse midwives," and the inquiry is apparently focusing on Travis County, according to a document obtained by the Austin American-Statesman.

While the exact target of the investigation is unclear, the attorney general's office has sent "civil investigative demand" letters -- roughly the equivalent of subpoenas -- to some hospitals across Texas asking them to produce information on their **midwife** programs.

A copy of one of the letters shows that investigators are specifically asking out-of-county hospitals to turn over records or information on any communication they have had with Travis County hospitals about providing **midwife** services. Those questions raise the possibility that investigators want to know if doctors at Brackenridge, **Seton** and other hospitals have compared notes on how to handle -- or end -- **midwife** programs, in possible violation of state antitrust law, **midwife** advocates said.

"At this point we can only speculate that the attorney general is probably looking at the rights of nurse midwives," said Karen Fennell, a senior policy analyst with the Washington-based American College of Nurse-Midwives.

A spokesman for Attorney General John Cornyn declined to comment on the investigation or acknowledge its existence.

But a spokesman for one hospital, Judy Kinonen of the University of Texas Medical Branch in Galveston, confirmed that her hospital received a copy of the letter.

"We've checked with the attorney general's office, and they consider our response to that demand to be confidential," Kinonen said.

A similar letter was sent to the **Seton** network -- which operates **Seton** Medical Center and, under city contract, Brackenridge -- about one month ago, said Lin Hughes, an attorney who represents **Seton**. Hughes said she does not believe that **Seton** and Brackenridge themselves are targets of the investigation.

"It is our understanding that the hospitals are fact witnesses rather than targets,"

Hughes said. "What the attorney general would be looking for would be the competitors of the midwives to keep them out, and that would be the physicians."

Fennell said her office has received about 20 phone calls from midwives across Texas seeking information about the investigation after they were questioned by their bosses.

"Their CEOs have called them in and asked what this is about" after receiving the letters, Fennell said.

The investigation underscores ongoing tensions between Austin midwives -- who provide prenatal care and deliver babies, sometimes for women with no insurance or health-care options -- and some physicians who believe midwives are risky or cut into their practices.

It is not known what possible antitrust violations might be under investigation, Fennell said, but the questions surfaced after the decisions to end **midwife** programs at Brackenridge and **Seton**.

Brackenridge, citing financial losses, halted its **midwife** program in May. **Seton** has said it will end its program Dec. 31.

Before dropping its program, Brackenridge had a policy requiring that a sponsoring doctor be present at the hospital every time a **midwife** delivered a baby, said Libba Letton, a spokeswoman for the Austin chapter of Texans for Midwifery.

Seton Medical Center also has such a policy.

But no other hospitals in the state have such a requirement, and it is not a standard practice nationwide, Fennell said.

Brackenridge's policy was "unusual, and it's impossible to abide by," said Jackie Griggs, a Houston **midwife** who is vice president of the Association of Texas Midwives.

Requiring a doctor's presence, she said, may have been a back-door way for doctors to scuttle the Brackenridge program.

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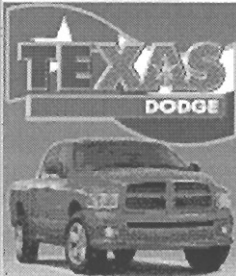
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Web posted **Sunday, August 4, 2002**
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Newspaper: Midwife programs investigated

AUSTIN (AP) - Doctors at Brackenridge Hospital and Seton Medical Center decided almost three months ago to end the only two programs in Austin that allowed midwives to deliver babies in local hospitals.

Now, the state attorney general's office is investigating possible antitrust violations "in the provision of obstetrical services by nurse midwives" and the inquiry apparently is focusing on Travis County, according to a document obtained by the Austin-American Statesman.

The exact target of the investigation is unclear, but the attorney general's office has sent "civil investigative demand" letters to some hospitals across Texas asking them for information on their midwife programs.

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Midwife advocates say the questions raise the possibility that investigators want to know if doctors at Brackenridge, Seton or other hospitals have compared notes on how to handle midwife programs in possible violation of the state antitrust laws.

"At this point we can only speculate that the attorney general is probably looking at the rights of nurse midwives," said Karen Fennell, a senior

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policy analyst with the Washington-based American College of Nurse-Midwives.

A spokeswoman for Attorney General John Cornyn did not immediately return a call from The Associated Press on Saturday. A spokesman declined to comment on the matter to the newspaper.

Judy Kinonen of the University of Texas Medical Branch in Galveston confirmed that her hospital received a copy of the letter.

"We've checked with the attorney general's office, and they consider our response to that demand to be confidential," Kinonen said.

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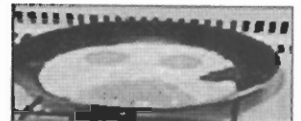
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Choices

Kari Ward spent 10 years as a registered nurse working on the labor and delivery floor. She monitored the health of pregnant women, determined how they were progressing and recommended when drugs should be given or when surgery, such as cesarean sections, should take place.

She would do this, report to a physician who would usually take her at her word as to what was happening even if he was never present to monitor the woman personally. Basically, the woman's care was in her hands. And no one had a problem with that setup.

Over a decade of doing this job, Ward received her bachelor's degree, the equivalent of two full-time years of schooling. She then went to midwifery school for two years and followed that up with a year in a master's program.

Now, after seven years of formal education and countless hours spent working in hospital delivery rooms, Ward is no longer allowed to do the work she once did as an RN after just two years of schooling.

Ward is now licensed by the state as an independent care provider. She is certified to work under her own license and take care of her own patients with no supervision. She is allowed to prescribe drugs, do physical assessments and just about everything else a practicing

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Yet to work in a hospital, as Iowa law says she is entitled to do, she must first sign her patients over to a physician and practice under that doctor's license. Doing so, believes Ward, negates her role as an independent practitioner and makes the choice of health care provider a hospital decision rather than the choice of a woman. In Des Moines, there were no midwives working at hospitals until 1996 when Methodist Hospital brought a small number on staff under the supervision of physicians at Integra Health Systems. The midwives here are considered dependent health care providers by the hospital because they must practice under the license of a physician.

Certified nurse midwives can also legally attend births at homes and in hotels, but before 1996 if something were to go wrong, no hospital access was allowed for the midwife, the woman who best knew the condition of the patient.

After Methodist introduced midwives to Des Moines, independent practitioners began applying for clinical privileges at the hospital so they could care for their patients who prefer, or need, such a setting. Iowa law states that hospitals must allow clinical privileges to a registered nurse practitioner, of which nurse midwives are a category, so long as they can prove they've met the requirements - the license, insurance etc. But hospitals have managed to shut out many independent practitioners by not allowing them admitting privileges. Though midwives would argue that admitting a patient to the hospital is the very first clinical act of a care provider, the hospitals argue -successfully so far - that the two are separate issues.

In order to admit a patient into a hospital to provide the care they are fully licensed to provide, a nurse midwife must find a doctor willing to admit their patient under his or her own name, even though they've had nothing to do

with the patient up until that time.

The problem is that few doctors are willing to do this. And who can blame them? Given the already sky-high malpractice insurance rates they already pay, what doctor would agree to put his name on a patient's file with whom he will have no interaction. If something goes wrong, as things often do in hospitals, the admitting doctor could be held legally responsible for the problem, even without ever seeing the patient.

"That's really their patient," says Cheryl Puderbaugh, a certified nurse midwife and founder of Heart and Hand Women and Children's Health Care Clinic.

"It's really asking of physicians an impossible thing, but that's what they do."

This setup, claim area midwives, actually prevents them from having the privileges they are entitled to by law. Some, including the Iowa Nursing Association, says this may even be illegal.

"It's all about physician control of the hospitals," says Linda Goeldner, executive director of the Iowa Nursing Association. "Administrators usually go along with this because they see physicians as a revenue stream. You run right up against physicians making those decisions and keeping them from practicing. We call it restraint of trade."

In contrast to what the state license says, Methodist hospital considers all certified nurse midwives to be dependent health care providers and mandates that every patient they have in a hospital be directly seen and reviewed by a doctor every day, to basically check the work of the midwife. But, practically speaking, the RN with just two years of schooling has no such restriction.

"What they are saying is they'd rather have a person doing this with just two years of school than having a certified nurse midwife with three

times the training and education," says Ward.

This situation exists, says Puderbaugh, simply because of the ignorance of the medical community concerning the practice of midwifery. "Many physicians simply are not well-informed about midwives and our scope of practice," she says.

During midwifery school, she was required to send a questionnaire to every OB practicing in Des Moines, to gauge their knowledge of what is required to be a certified nurse midwife. Of the 60 to 70 doctors she sent it to, about 60 percent returned the poll and only two answered the questions correctly. "People have a preconceived notion of who we are and what we do and they base decisions on that," says Puderbaugh.

While most physicians are trained to view pregnancy as a medical condition, and birth as a process wrought with life-threatening complications, midwives view it as a natural event in the life of a woman that if monitored properly is, in most cases, fairly straightforward with few complications.

"The vast majority of pregnant women with safe pregnancies walk into a surgeon for care. And that's why we have a 25 percent Cesarean section rate," says Ward. "Surgeons are trained to deal with pregnancy surgically and that's what they do."

Puderbaugh's own daughter needed cardiac surgery within hours of birth. At that point, she says, she didn't care if the doctor was warm and fuzzy, only if he was the best cutter. There is a time and a place for each type, and that needs to be recognized.

"It's not about who is best," says Puderbaugh. "It's about who should do what and at what level. Pregnancy should be looked at as a normal thing. I firmly believe that doctors and midwives should be collaborative. There should be a relationship between us of mutual respect and

trust."

Hospitals elsewhere have recognized that there is a place for both approaches in their halls. In some states, midwives and physicians work side by side. In much of Europe, midwives are the norm, rather than the exception for healthy, pregnant women.

And research shows that this is the best approach. Numerous studies show that women who receive care from a certified nurse midwife are much more likely to have healthy babies with far fewer complications than those delivered under the care of a physician.

One such study from the Centers for Disease Control, published in the Journal of Epidemiology in 1998, found that the risk of infant death was 19 percent lower for certified nurse midwife attended births than for those attended by a physician. The risk of neonatal mortality was 33 percent lower. The risk of delivering a low birth weight infant was 31 percent lower.

The study concluded that "Certified nurse midwives provide a safe and viable alternative to maternity care in the United States, particularly for low to moderate risk women."

Despite the obstacles in their way, independently practicing midwives have still managed to get their foot in the door at Methodist and are currently catching babies in the hospital. Yet the obstacles are many and the problem seems to be growing worse. Only two local physicians will agree to be used as backups for midwives, and they cannot cover every practitioner in Des Moines.

Patients, and potential patients are feeling the ramifications of this system across Des Moines.

Puderbaugh opened the Heart and Hands clinic in 2000 on the city's North Side because that area has some of the highest infant mortality rates in the state. In some areas, 20 children,

out of every 1,000 born, sometimes many more, die within the first year of birth. Opening the clinic and offering the services of a midwife to the women in this area was an effort to stop these kids from dying at such an alarming rate.

The clinic sees anywhere from 20 to 25 patients a day on average. About half of those are OB patients; a third of them are Hispanic. Between Puderbaugh and Ward, they attend about 10 births every month. Currently, they have 54 women waiting to have their babies.

Ward had Dr. Paula Mahone, a doctor specializing in high-risk pregnancies who delivered the McCaughey septuplets and Dr. Michael Mintzer, an OB/GYN as her two backups. These are the only two doctors in Des Moines currently willing to take this risk.

But because Heart and Hands has so many hospital patients, Mintzer had to drop them. He doesn't want such a heavy workload. It's nothing personal, he just can't do it. Mahone's partner has agreed to be backup on a temporary basis, only until May 12.

Puderbaugh found a loophole that will allow her to practice at the hospital with just one backup until mid-September, but Ward will no longer be allowed to treat patients in the hospital after May 12.

What they could do, and will, is provide care for the woman for the nine months leading up to the actual birth and then send them to the hospital to have the baby with a doctor who is on call. The woman, though, will not receive care at the crucial moment of birth from the provider she'll have come to know over the previous months and will deal instead with a doctor who knows nothing about her, her family or the manner in which she would like to give birth.

And those statistics showing a midwife delivering the baby is, perhaps, the safest way to go, would no longer apply for these women.

Even though ward and Puderbaugh will have cared for the women for nine months, if the woman is a Medicaid recipient, as most of their patients are, they will not get paid a dime for their work. Only the doctor catching is reimbursed for the entire pregnancy.

"It would pretty much shut us down in terms of finances," says Puderbaugh. "Our chief money maker is maternity care."

Cosette Boone is a certified nurse midwife and founder of Willowsong, a private practice that provides both home and hospital births. It's a small practice that requires little from the back-up physicians, as she attends, at most, three births a month.

Boone also works as a nurse practitioner at La Clinica, a medical clinic on the East Side near the Fairgrounds that mainly serves the Hispanic population of Des Moines. She's working to establish a program for pregnant women at the clinic that would be the first of its kind in Iowa.

The program would involve group prenatal care overseen by Boone for women who are due at about the same time. Boone who would later catch the women's' babies at Iowa Lutheran hospital. This program, says Boone, would provide women at the clinic the opportunity to have better health care for them and their babies in the environment they are already familiar with from a midwife they already know.

"It's a fantastic thing," she says. "It's never been done in Iowa."

And it won't be any time soon.

"We're at a standstill because we can't find consulting physicians," says Boone. "The docs I've consulted with say it's a matter of liability."

If it weren't for the liability issues created by Iowa Health System's rules for nurse midwives, Boone believes the program would be up and running soon and the women receiving care.

Currently, La Clinica is turning away about 10 pregnant women every month.

"It's sad," says Boone. "It means that more women are going to be referred out. But they have a home at La Clinica. This is so important for this group that is so isolated in their community.

"I'm at a point where I'm just frustrated," she adds. "I'm not even sure if they realize what a huge project this is. I was almost in tears when the doc called me and said no."

When she first started her practice Boone wrote to every single doctor in Des Moines, looking for a backup physician, and found only Drs. Mintzer and Mahone willing to consult with her.

"It's a disaster," says Boone of the problems midwives face in Des Moines. "There are so many physicians who don't want to work with us and don't agree with the midwifery philosophy of care. It's just ignorance. They really don't understand the issues and why would they unless they've ever worked with midwives?"

Drastic changes to the admitting system are needed for Boone to open the La Clinica program. A committee is working at Methodist to change the requirements, but she is not optimistic.

"I'm not holding my breath on this," says Boone. "As much as I'd like to believe this community will change, my heart tells me the doctors are not interested. The statistics are behind us and the research is behind us. I just don't get it."

Ensuring the best possible care to the women who need it most should really be a simple thing, she insists. But it's just not being done.

"All it entails is people working together and we're just not doing that."

Jill Carlson, a registered nurse with a bachelor's degree in nursing, works at Lutheran Hospital as a labor and delivery nurse. She's part-time now,

but for almost a year served as team leader of the maternity center.

In that time, she watched babies being delivered with the help of a physician. She's seen things go perfectly and things go horribly wrong.

When Carlson became pregnant last year with her first child, she knew immediately that she did not want to give birth in the hospital where she worked. Or any other for that matter.

"There are so many reasons," she says. "Policies and procedure a lot of times dictate that care you are receiving. Not the choices a woman makes.

"I didn't want to see a group of doctors, just one provider," she adds. "You'd like to know who the person is at the end of your stirrups." But most importantly, in just the couple years she's been working at Lutheran, she's seen enough of what goes on behind the scenes in a hospital birth to feel she would be better off elsewhere.

"There are unnecessary interventions that are done," she says. "Doctors have dinner parties to get to, they have a hockey game to get to so they do a C-section on a woman whose labor is progressing perfectly because it doesn't fit their timeline. A lot of times things are done and they don't explain why. Those are not choices I want someone else to make for me and my family."

So she contacted a midwife.

But not just any midwife. Carlson called the one midwife that many in Des Moines' medical community might consider their archenemy.

She called Carey Ann Ryan, who, just five months ago, was escorted by security guards from the grounds of Methodist hospital.

Five months ago, Ryan took a woman to Methodist hospital who went into labor early and need to be transported. The woman chose to go to Methodist, even knowing that Carrie had received a letter just days before from Iowa

Lutheran Health Systems stating that she would be removed from the property if she brought in more patients because she does not have privileges.

Security guards walked Ryan to the front door and told her she'd have to go stand on the public sidewalk in the middle of a lightning and thunderstorm.

She told them they'd have to call the police, which they promptly did.

Luckily, her husband arrived first to pick her up and she left the hospital followed by three Des Moines Police squad cars. "This is not the way one group of professionals treats another," says Ryan.

Ryan is also the founder of the Almost Home Birth Center on Grand Avenue that cannot be opened because it has been denied a certificate of need from the state despite apparently fulfilling all requirements.

Carlson had hoped to have her baby in the birthing center, because she lives too far from Des Moines to feel comfortable with a home birth. But because the center won't be legal, Carlson will give birth in a Des Moines hotel room, accompanied by Ryan.

Ryan has resigned as the birth center's president and clinical director hoping that her removal from the business will encourage the state to allow it to open so that other midwives and doctors can make use of the space.

Methodist ahs formed a subcommittee to look at the rules governing certified nurse midwives practicing at the hospital.

Mintzer, the doctor heading the subcommittee, says the hospital is not required to grant midwives privileges and has the option of restricting their licenses, but hopes the situation will improve.

*JCAHO (Joint Commission on Accreditation of

Healthcare Organizations) says hospitals can choose to make their licensing more restrictive," he says. "A hospital can choose to make midwives dependent. But it undermines what a midwife is trained to do, to take care of healthy, low-risk women."

Dr. Mark Purtle, Chief Medical Officer for Iowa Health Systems says it is important to be cautious when allowing privileges because a hospital can not allow a practitioner to do more than their license allows.

"We have to, as an organization, assure the quality of our members," he says.

"Within the organization, we determine the privileges of everyone. What the license allows and what the credentials of the individual allow are different."

Meaning just because a doctor is licensed to perform surgery, doesn't mean he is capable of doing so.

And, he says, the reason that midwives are not allowed admitting privileges is basically because it's always been that way.

"This is historically set up this way, that the privilege of admitting has historically been with the physicians that hold unlimited license," Purtle says. "The medical staff would have to approve any changes."

The addition of a large number of nurse practitioners in Des Moines is a relatively new development that has only come to light in the last few years, says Purtle. And it's something they've never had to consider when talking about privileges.

Mintzer's subcommittee hopes to reverse the current requirements on midwives so that sponsoring doctors are not required to do daily work on the midwives' patients.

But even if successful, the problem would remain. Doctors would still maintain their liability

and could be sued by a patient that they didn't even know existed. And what doctor would do that?

"It means if they have a lawsuit involving a patient they took care of, if I happen to be the consulting physician, I am open to that lawsuit even if I never saw the woman or was never called about them," says Mintzer.

In his time as a backup physician, Mintzer never experienced or encountered a serious problem because of the midwife's practice.

Yet he doesn't hold much hope that midwives will be allowed to practice independently in the near future.

"We hope that eventually midwives will be able to practice independently at Methodist hospital," says Mintzer. "But we're trying to do a little at a time because if we do too much, I think it's likely to fail."

The OB department at Methodist will make a recommendation to change the bylaws, or ask to leave them as is, by the end of the month. It will then be up to the medical executive committee to make a decision and pass it on to the hospital board for a decision.

The final determination of how midwives will be allowed to practice will likely take some time. And even if the bylaws revert to the old method of signing in under a doctor's name and then practicing autonomously, midwives like Puderbaugh, Ward and Boone, who want to expand their reach in the community, will continue to be shut out.

Ryan is not hopeful that anything will change. She has applied for clinical privileges several times at Methodist Hospital but has been denied every time because she refuses in her application to list the names of two doctors under whose name she would admit her patients.

Unlike other midwives in town who do so and

are allowed to practice, Ryan refuses, believing her license to practice independently is enough and that no hospital should be allowed to prevent her from practicing what Iowa law says is her right.

"I look at my colleagues like Cheryl (Puderbaugh) who take on a slew of underserved patients hoping that being nice and playing along will eventually get them privileges, but it won't," says Ryan.

However, not all midwives agree with Ryan's approach.

Dana Ericson, a certified nurse midwife practicing at Methodist hospital couldn't agree less with Ryan's attempts to change the system.

"I think her approach for years has helped hold back the practice of midwifery in this community," says Ericson of Ryan.

Ryan, says Ericson, is not willing to negotiate, will not sit at the table to discuss compromise and doesn't understand that change takes time and won't happen without building relationships with the people who make these decisions.

This has been Ericson's approach since she began working as a midwife.

Ericson was the first nurse midwife to apply for privileges at Methodist. Her time there, she says, has been productive and rewarding.

"My own experience at Methodist the last five years has been positive," she says.

"The decision for me was where can I have the most influence in moving midwifery forward in this community."

She chose to do strictly hospital births with the idea that when doctors and nurses and other women see how she practices and come to understand that she is a qualified professional, they will begin to realize that a change needs to occur.

Ericson worked at Methodist for a full year before convincing the hospital to let her have water births in the hospital. They now allow that, the only hospital in Des Moines to do so.

And it took a year of meetings to make this happen, she says. A year of sitting with staff and discussing this with them and showing them the studies and statistics before they would allow her to do it. Now it's a fairly common occurrence. "The more we sit down with these people, the more trust develops," she says. "It makes a difference. We're latecomers here. It takes time."

And she believes that change will come soon, and midwives will be practicing independently in Des Moines before long.

"I totally believe it and I'm looking forward to it."

- Tim Schmitt

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ADDENDUM

**ACNM Testimony/Case Study F: New York-Presbyterian Hospital, New
York, New York**

Newspaper Releases

No midwives need apply

'Doctors only' sign hangs in delivery room

By Marie Villani

Janet Steinberg has delivered more than 1,500 healthy babies since becoming a midwife in 1984. But come Oct. 1, the Riverdalian will have to leave most of her expecting mothers at the labor room door.

Citing a large and growing number of high-risk pregnancies, New York Presbyterian Hospital has decided that it is no longer safe to allow the 28 midwives on staff at the Allen Pavilion to deliver most babies.

The hospital says so many of their obstetric patients at the hospital are low on the socio-economic scale, obese or over the age of 35 that only obstetricians can attend childbirth.

Midwives don't buy that rationale, although since they continue to have a relationship with the hospital, they asked not to be named. Said one, any hospital that serves poor people is going to have a high number of at-risk patients, as defined by the state Department of Health, since poverty is an indicator of risk. Midwives, she added, tend to have a better success rate with these types of patients.

"Two years ago we started to look at the changes in the women who were coming to Allen Pavilion," explained Cynthia Sparer, senior vice president and chief operating officer for the hospital's programs for women, children and community health. "We found that 87 percent of the women who were

(Continued on page A2)

ADDendum F

...and set on a nationwide... because of the size and fa... Presbyterian Hospital's mid... program.

Appalling decisio

"I would say that the len... time this institution has been... the volume of women serve... the rationale for this particula... sion makes this appalling to th... wifery community," said Dr... Williams, executive director... American College.

The change also ends a bi... collaboration between Col... University's School of Nursin... Midwifery and the midwifery... at New York Presbyterian — b... which opened in 1955. Forty pe... of Columbia's students train in.

Midwives method o

By Marie Villani

Like obstetricians, midw... see patients throughout a pregn... and screen for risk factors, in... ing nutrition, family history ar... tesses. But when it comes to... actual delivery, midwives and p... cians tend to go separate ways.

Working in a more holistic... ion than doctors, midwives tend... nature take its course, said Dr... Williams, executive director o... American College of Nurses... wifes. Hospitals, on the other h... tend to free up beds as quick... possible, she said.

Inducing labor and contin... electronic fetal monitoring —... mon medical practice in Amer... hospitals — are not in the... wife's toolbox for delivering ba... Midwives pride themselves on... contribution to decreasing the n... ber of Caesarean sections, whic... some hospitals have become v... ally routine.

"The majority of problems... pregnancy can be dealt with thro...

camp

Midwives fears the new restrictions will set off a nationwide trend, because of the size and fame of Presbyterian Hospital's midwifery program.

Appalling decision

"I would say that the length of time this institution has been open, the volume of women served and the rationale for this particular decision makes this appalling to the midwifery community," said Deanne Williams, executive director of the American College.

The change also ends a historic collaboration between Columbia University's School of Nursing and Midwifery and the midwifery service at New York Presbyterian — both of which opened in 1955. Forty percent of Columbia's students train in actual

Ms. Williams of the College of Nurses-Midwives said she believes that the catalyst for the change lies more in the size of physicians' pocketbook than in their capability. "I call it the physician land grab," she said.

Ms. Sparer denied that doctors' remuneration was an issue, saying there was no economic incentive for the change. She pointed out that more than half of the hospital's patients are insured through Medicaid, the government-funded program that insures those who can't afford it. The reimbursement from Medicaid is usually a tenth of what hospitals or doctors receive from private insurance.

Said Ms. Williams, "There is no data to say that this model isn't working. It is simply, 'We want all these patients and all this money to go to the physicians.'"

Midwives offer natural method of giving birth

By Marie Villani

Like obstetricians, midwives see patients throughout a pregnancy and screen for risk factors, including nutrition, family history and illnesses. But when it comes to the actual delivery, midwives and physicians tend to go separate ways.

Working in a more holistic fashion than doctors, midwives tend to let nature take its course, said Deanne Williams, executive director of the American College of Nurses-Midwives. Hospitals, on the other hand, tend to free up beds as quickly as possible, she said.

Inducing labor and continuous electronic fetal monitoring — common medical practice in American hospitals — are not in the midwife's toolbox for delivering babies. Midwives pride themselves on their contribution to decreasing the number of Caesarean sections, which in some hospitals have become virtually routine.

"The majority of problems of pregnancy can be dealt with through

education and getting healthy support systems for the expecting mothers," said Ms. Williams. "If you are seeing every patient as a walking disaster then all you're going to be doing are a lot of procedures that aren't necessary."

Although the number of American midwives is modest compared to their European counterparts, they have become an important factor in the city's hospitals. In 2001, the most recent year documented, midwives delivered 13,000 of New York City's babies — roughly 11 percent.

For midwife Janet Steinberg, who is originally from Britain where the midwives attend the majority of uncomplicated births, adjusting to Presbyterian Hospital's decision to stop midwives from attending most births at the Allen Pavilion in Inwood will not be easy.

"It's like telling a surgeon 'You can do the prepping, but you can't do the surgery.' That's part of our job," she said. "However, I think the focus should be what the women of this community are going to lose."

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June 15, 2003, Sunday

THE CITY WEEKLY DESK

NEIGHBORHOOD REPORT: WASHINGTON HEIGHTS; Midwives Fear for Their Role In Hospital Deliveries

By SETH KUGEL (NYT) 486 words

The midwives at New York-Presbyterian Hospital can easily keep in touch with former clients: a walk to the local playground is often enough to bump into a mother and child they served. Midwives like that. They pride themselves on long-term, holistic relationships with women before, during and after pregnancy.

But come October, the hospital will curtail midwives' role in the major event in these relationships, the actual delivery.

"Yes, this is about changing our jobs, but the real thing it's about is the community, and how it affects how they have their babies and how families get started," said Janet Brooks, one of 21 midwives directly affected.

Cynthia Sparer, senior vice president of the hospital, said the decision stemmed from an analysis showing that 85 percent of its pregnant patients have some risk factor.

"We needed to move to a model that would have our deliveries being performed by obstetricians," she said, stressing that midwives would still have some role in the delivery. "We value our midwives, and they are they are absolutely an essential element of the health care team here."

As for the issue of continuity of care, she noted that the midwife present at delivery is rarely the one who provided prenatal care.

A group of the midwives, some of whom say they were told they would play no part in delivery, have appealed to local officials and to the American College of Nurse-Midwives, based in Washington. Deanne Williams, the national group's executive director, said the change was "beyond comprehension" and a threat to "the survival of the profession." "Our concern is that this is a physician land grab, and they want to be able to bill physician rates for all the patients," she said.

Ms. Sparer disagreed, saying the levels of hospital billings would not change. She also said the new

policy was unrelated to a civil suit over obstetrical billings that Columbia University, whose medical employees work at the hospital, settled in December with federal prosecutors.

Although some hospitals have never allowed midwives to oversee deliveries, the percentage of American births attended by them increased to 7.3 percent from 3.2 percent between 1989 and 2000, according to the American College of Nurse-Midwives. In 2001, midwives attended at more than 13,000 births in New York City, 10.6 percent of the total.

New York-Presbyterian has one of the oldest hospital midwife programs in the country, dating to 1955. Under it, midwives see women with normal pregnancies but are trained to call in doctors at any sign of trouble. SETH KUGEL

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News Release

For Immediate Release
July 1, 2003

Contact: Shawn Farley
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A Setback to Latino Maternity Care in NYC

New York-Presbyterian Hospital will halt nurse-midwife attended births at Allen Pavilion, interrupting significant advances in Latino birth success rates, and raising the overall cost of healthcare.

The nurse-midwives at NYPH Allen Pavilion serve mostly patients of Dominican descent, along with African-Americans and low-income patients of other ethnicities. New York Presbyterian contends that nearly all of the expectant mothers served by this practice are considered high-risk and will only be attended by physicians as of October 1. However, New York Health Department statistics show that the infant mortality and low birth weight rates among Latinos in the area served by New York Presbyterian are far lower than, and in some cases, **half** that of the New York city average.

"After almost half a century of midwifery care, Presbyterian has not explained why this group of patients is too high risk for nurse-midwife assisted births. If they really believe that these women are at risk, why wait until October to make the change?" remarked **American College of Nurse Midwives Executive Director, Deanne Williams, CNM, MS**. *"Midwives offer women a model of care that places a high value on quality health care, accurate and timely information, shared decision making, respect and family involvement. Women want continuity of care from compassionate providers and it is hard to believe that that NY Presbyterian is putting the needs of the women first"*

This policy change at New York Presbyterian will deny Latinas access to nurse-midwives who have spent significant time with them prior to delivery. Information gleaned from prenatal visits may be lost in transition, as there will be much less familiarity between expectant mothers and physicians.

The new policy may also hamper the ability of midwifery students from The Columbia University School of Nursing to gain experience that may one day benefit their patients, and could magnify the already serious shortage of women's healthcare professionals.

The end of nurse-midwife attended births at New York Presbyterian may also place a larger financial burden on publicly sponsored healthcare programs such as Medicaid. Nationwide, women who see physicians experience nearly double the number of cesarean section births than those cared for by nurse-midwives.

"These procedures are more costly than traditional births and their incidence can be increased by excessive utilization of costly medical interventions such as induction of labor," said **ACNM Executive Director, Deanne Williams, CNM, MS**. The higher cost of these procedures may ultimately be paid by the American taxpayer.

The end of nurse-midwife attended births at Presbyterian benefits no one. Expectant mothers from lower income brackets, and the public at large, will be left with higher healthcare costs, fewer women's healthcare professionals, and a loss of trusted healthcare providers.

For more information, or to speak to an ACNM in New York, Please contact Shawn Farley at 202-728-9876 or sfarley@acnm.org.

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With roots dating to 1929, the American College of Nurse Midwives is the oldest women's health care association in the U.S. ACNM's mission is to promote the health and well being of women and infants within their families and communities through the development and support of the profession of midwifery as practiced by certified nurse midwives and certified midwives. Midwives believe every individual has the right to safe, satisfying health care with respect for human dignity and cultural variations. More information about ACNM can be found at www.midwife.org.

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ADDENDUM

Articles

Occupational Licensing of a Credence Good: The Regulation of Midwifery

A. Frank Adams III, * Robert B. Ekelund Jr., † and John D. Jackson‡

A general theoretical and empirical model of the impact of regulation on supply and demand (prices and quantities) is developed in this paper. The regulation of midwifery services—of certified nurse-midwives (CNMs)—relative to obstetricians (OBs) is analyzed within this framework. Demand-side (quality assurance) effects are distinguished from supply-side (Stigler-Peltzman) effects in the model. Since both unambiguously predict a price increase, we focus on the regulatory impact on quantity. We find, within the empirical model, that while both effects are present, supply-restricting effects dominate quality assurance in the U.S. market for CNM services. When mean regulations are compared to minimum regulations in the sample, CNM births increase from just under 6% of all births to a little over 11%. On net, regulation reduces the quantity of CNM births.

1. Introduction

Occupational licensing is as old as trade. Estimates are that in the United States alone, at least 800 occupations require some form of “license to practice” (Rottenberg 1980, p. 2). Midwifery is most certainly among the oldest occupations known to *Homo sapiens*, and, unsurprisingly, it has been the subject of licensing regulations over the 20th century. There has been, however, a marked reemergence of the practice over the past 20 years in the United States. After nearly being driven from existence by physicians in the early part of the 20th century, the percentage of midwife attended births has risen from 0.9% of all births in 1975 to 5.95% of all births in 1995. This latter figure translates into 231,921 midwife-attended births for the year 1995. Of this figure, CNMs attended 94.3%, or 218,613, births. A number of factors account for this resurgence, including women’s expression of their right to choose birth practitioners and place of birth, increased political expression of that right, and the escalating costs of traditional childbirth services by obstetricians (OBs) and hospitals (Butter and Kay 1988). In contrast, midwife-attended births account for a full 75% of all births in Europe, with far lower infant and maternal mortality rates reported (Cohurn 1997).

Midwives are classified into two basic categories in this country: lay midwife and certified nurse-midwife (CNM). Lay midwives typically receive no formal educational training but are clinically trained through apprenticeships. On the other hand, a CNM “is a registered nurse with advanced training in midwifery who possesses evidence of certification by the American College of Nurse-Midwives (ACNM)” (Adams 1989, p. 1038). The practice of nurse-midwifery, as defined by the ACNM, is “the independent management of care of essentially normal newborns and women, antepartally (before birth), intrapartally (during birth), postpartally (after birth) and/or gynecologically

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We are grateful to Michael Dueker and his coauthors for sharing their unpublished manuscript on advanced practice nurses with us. We are, of course, liable for any errors in our paper.

Received January 2001; accepted March 2002.

... within a health care system which provides for medical consultation, collaborative management, and referral" (Safriet 1992, p. 425).

The causes and effects of state regulation that determines the extent of professional independence from physicians of advanced practice nurses (APNs) has been analyzed by Ducker et al. (2000) for the same general period we employ. Advanced practice nursing, however, includes nurse practitioners, clinical nurse specialists, and nurse anesthetists as well as CNMs. Ducker et al. (2000) suggest that, for this larger category of nurse specialists, APN earnings are lower and physicians assistants earnings are higher in states where APNs have attained higher levels of professional independence (measured in part by prescriptive authority).¹ Midwifery has been included, along with other health care professions, in interesting studies of the impact of the composition of public licensing boards on particular occupational requirements (Graddy and Nichol 1989; Graddy 1991), but (to the best of our knowledge) midwifery has not been isolated in any study of effects of regulation(s).² The purpose of this paper is thus to analyze empirically the economic impact of alternative forms of regulation within the state markets for midwife services. Certified nurse-midwives are formally recognized by the American College of Obstetricians and Gynecologists (ACOG) and are now able to practice legally in all 50 states including the District of Columbia, but CNMs practice under significant and significantly different regulations that limit their scope of practice and constrain their use by women (DeVries 1985) within the 50 states. There are suggestions in the literature that the severity of regulations at the state level—a partial product of past pressure by the medical establishment (OBs in particular)—has had deleterious effects in the market for midwives' services. However, there has been (again to the best of our knowledge) no empirical support for such propositions or an analysis of the particular impact of alternative regulations.³

We believe that the market for midwives is particularly interesting from an economic perspective.⁴ Midwifery is, to a large extent, a credence good, as much certainly as many other medical services. Such goods, it is sometimes argued (Leland 1979; Shapiro 1986), "demand" regulation on the basis of quality certification. Consumers, it is often alleged, will tend to drift to the low-price, low-quality alternative in the absence of such regulation. Imposition of some regulation in such markets may, in effect, shift the quality-adjusted demand curve rightward, improving consumer welfare and increasing the quantity supplied of such services. We label the potential quality-improving aspect of regulation the "demand-side effect."

Alternatively, mandatory occupational licensing, along with restrictive regulations supported by OBs and other medical professionals, may restrict entry, competition, and consumer choice. In short,

¹ Ducker et al. (2000) suggest that this result may obtain because physicians substitute physician assistants for APNs for self-interested reasons.

² Graddy and Nichol (1989) explore the effects of public licensing board members on legislative regulatory reforms using four health-related occupations (chiropractors, licensed practical nurses, physicians, and registered nurses). Their results suggest that the more public members (not members of the occupation being licensed) an occupational licensing board has, the more effective the board is "in reducing the number of nonsense requirements (morality, age, residency/citizenship) that limit entry into the four health occupations studied" (1989, p. 623). Graddy's (1991) study covers dietitians, nurse-midwives, occupational therapists, physician assistants, psychologists, and social workers. See also Gaumer (1984), who reviews the empirical literature in the area.

³ The ACNM reports that the states with the most restrictive regulations have the lowest percentage of CNM-attended births, 1.7% (1991 figures), while those states that are moderately supportive and supportive of CNMs have 4.5% and 6.0%, respectively, of all births attended by CNMs.

⁴ Occupational regulations for credence goods, including some aspects of midwifery, have been explored. Sass and Nichols (1996), for example, explain why nonphysician health care professionals might demand less regulation (meaning less physician controls) in spite of income reductions for themselves. Using a "full-value" argument, they argue that, for some professionals, the nonmonetary rewards of independence may be high.

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a "supply-side" effect may be identified with restrictive regulations on CNMs that potentially reduces consumer welfare and redistributes wealth to competitors. The most important expressions of this view may be found in the work of Stigler (1971) and Peltzman (1976). In the case of CNMs, some regulations permitting certain benefits to the occupation, such as access to hospital facilities, granting prescriptive authority, or Medicare reimbursement, would put midwives on parity with OBs. These regulations, which would put midwives on a level competitive status are (generally) opposed by OBs (who wish to suppress a substitute and raise OB price), would shift the supply of CNM services rightward. Alternatively, regulations that limit the scope of midwives' activities would shift the supply curve of such services leftward, restricting supply and transferring income from CNMs and consumers to OBs with a deadweight loss.

Both the demand-side (quality enhancement) and the supply-side hypotheses unambiguously predict higher observed price increases, but the two diverge when predicting the quantity effects of more stringent occupational regulations. We therefore focus on quantity changes and regard our study of state midwifery regulations as one test of whether the dominant effect of regulation is to, on net, increase quantity through quality enhancement or to reduce the quantity consumed through a reduction in the quantity of services.⁵ In calculating the effects of both demand and supply shifts in the CNM market, we compare the net effect of average versus minimum state regulations, where minimum regulations would represent parity with OBs.

The paper opens with a discussion of the institution of midwifery in the United States and a brief accounting of the types of regulations on this "credence good" in the 50 states. Next, a theory and empirical model are established to test for the effects of regulation. Finally, we analyze our results and offer some conclusions concerning the outcome of regulations in the market for a service characterized as a "credence good."

2. The Regulation of Midwifery in the United States

Midwifery regulation in the United States takes place under a plethora of methods and means. Table 1 summarizes eight of these methods and identifies the states that use them. According to data obtained from the ACNM in Washington, DC, as of 1995 there are a variety of methods for establishing a regulatory board's authority over nurse-midwifery practice. We have constructed our variable, MEDICAL BOARD AUTHORITY OVER CNM'S, by combining the two states that regulate CNM practice using a board of medicine with the five states that use a department of public health/board of health. Further, there are presently 27 states plus the District of Columbia that require CNMs to meet continuing education and recertification requirements as a condition for license renewal, with seven of those states requiring continuing education as a requirement for prescriptive authority only.

Prescriptive authority, the ability of a CNM to have discretion in the prescribing and dispensing of drugs that are within the scope of practice, is essential for a CNM to function independently of a physician. Twenty-four states plus the District of Columbia grant CNMs full authority to prescribe drugs and medication within their scope of practice as defined by the appropriate regulatory authority. Sixteen states either grant CNMs limited prescriptive authority or require physician control of that authority, while 10 states grant no prescriptive authority to CNMs.⁶

⁵ While we do not formally develop an analysis of price effects in this paper, we estimate, using unique price data, an empirical model that allows us to make preliminary welfare calculations. The calculations are reported later in this paper, and the empirical underpinnings are available from the authors on request.

⁶ As will be seen, we construct our variable so as to lump full prescriptive and limited prescriptive authority together. Decomposing these variables yields less "robust" results.

Both state and federal laws discriminate against and limit the ability of CNMs to practice by failing to mandate that third parties (private insurers) reimburse CNMs for services that are within their scope of practice and for services that are identical to physician provided (and third-party reimbursable) services.⁷ In some states, Medicaid reimbursement status for CNMs is at a rate that is substantially less than that for physicians for the same service provided.⁸

Guaranteed clinical privileges are also potentially important CNM restrictions since states enact laws that regulated whether hospitals may permit or prohibit hospital facilities use.⁹ In addition, we provide a variable that measures CNM control, CNM'S SUPERVISED BY MD'S, that would substitute for the part about CNMs being named in the authorizing statutes.¹⁰

Table 2 defines and provides sample means for all of the variables used in our tests. All eight regulations described with the state restrictions in Table 1 are included in the test. These variables are largely self-explanatory. We have included the percent of the Hispanic population as an independent variable in order to tract the effects of a social tradition of using midwives in Hispanic cultures.

3. Model Specification

A brief recitation of existing state rules and regulations reveals a wide diversity in midwifery regulation. And such diversity is suggestive of the varying intensities of political and other pressures that provide form to particular regulations affecting that occupation. Interest group strength is a clear determinant explaining forms of regulation in states or regions. Midwives, both lay and CNMs, are certain competitors with OBs. Hospitals, moreover, are competitors with less structured birthing centers and used by both OBs and midwives in some locales. Physician-sponsored state regulation of entry and other market aspects of medicine have been in place for well over a century in most states. Thus, some of the different incarnations of state regulation of midwifery may be explained, in part, by a "tar-baby" effect whereby a strong interest group (physicians) bring a substitute under the umbrella

⁷ Twenty-one states mandate private insurance reimbursement of nurse-midwifery services, while nine states have enacted an "any willing provider" (AWP) law. According to the American College of Nurse-Midwives (1995), AWP laws include "CNMs, either specifically as CNMs or as ANPs (Advanced Nurse Practitioners) or ARNPs (Advanced Registered Nurse Practitioners). AWP laws typically require HMOs or other categories of managed care plans to permit any health care professional to become a participating provider in that plan, so long as s/he is willing to accept the terms and conditions the plan offers to its chosen participating providers. Variations on such laws are 'freedom of choice' statutes, which prohibit class-based discrimination against certain categories of health professionals."

⁸ Reimbursement rates vary as a percentage of the physician fee schedule or on the basis of services provided. For the states covered in this study, the range is between 70% and 100% of the physician fee schedule, with a full 27 states providing reimbursements at the highest level. (Utah reimburses CNMs according to a CNM schedule.) Table 1 includes only those states (17) that reimburse CNMs at lower levels.

⁹ According to the American College of Nurse-Midwives (1995), 45 states have "no statutory or regulatory provisions (that) either require hospitals to grant admitting or other clinical privileges to CNM's or prohibit discrimination against CNM's" (p. vi).

¹⁰ Regarding CNM supervision (CNMs supervised by MDs), the American College of Nurse-Midwives (1995) reports that there are certain "signs" that indicate whether the Nurse-Midwifery Practice Act in a state is supportive of ACNM guidelines and standards for CNM practice. The "signs" in the state's practice act that indicate reduced support for CNM independence include (i) whether the practice act refers to protocols rather than practice guidelines, (ii) whether the scope of nurse-midwifery practice uses terms such as "medical functions" or "delegated medical acts," and (iii) whether the practice act uses terms such as "supervision" or "direction" to describe the CNM's relationship with physicians. The Nurse-Midwifery Practice Act in 27 states indicates reduced support for CNM independence by including some or all of the preceding language in the "act." The ACNM says that you have a "good" Nurse-Midwifery Practice Act if "the practice act defines nurse-midwifery practice as independent (either directly or indirectly) and does not contain requirements for physician supervision or direction" or "the practice act references or directly quotes the ACNM definitions of consultation, collaboration and referral to describe the CNM relationship with physicians."

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Table 1. State-Mandated Regulatory Restrictions over Certified Nurse Midwives

CNM Restriction	States with Restriction
Medical board authority over CNMs	CT, DE, HI, NJ, NM, PA, RI
Continuing education requirement	AL, AK, AZ, AR, GA, ID, IN, IA, KS, ME, MD, MI, MS, MT, NV, NM, ND, OR, RI, SC, TX, UT, VT, WA, WV, WI, WY
Insurance reimbursement mandated or any willing provider laws	AK, CA, CO, CT, DE, FL, GA, ID, IL, IN, KY, LA, MD, MA, MI, MN, NV, NH, NJ, NM, NY, OH, OK, OR, PA, SD, UT, WA, WV, WY
Clinical practice privileges guaranteed	FL, GA, OH, OR, VA
Prescriptive authority for CNMs	AK, AZ, AR, CA, CO, CT, FL, ID, IN, IA, KS, ME, MD, MA, MI, MN, MS, MO, MT, NE, NV, NH, NJ, NM, NY, NC, ND, OR, RI, SC, SD, TN, TX, UT, VT, VA, WA, WV, WI, WY
Supervised by MDs	AL, AR, CA, CO, CT, FL, HI, ID, KS, LA, ME, MD, MA, MS, MO, NE, NV, NJ, NM, NY, NC, OH, PA, SC, SD, VA, WI
Lay midwives permitted in state	AL, AK, AZ, AR, CA, CO, FL, GA, KY, LA, ME, MA, MI, MN, MS, MO, MT, NE, NH, NJ, NM, NY, OK, OR, PA, RI, SC, TN, TX, UT, VT, VA, WA, WV, WI, WY
Medical reimbursement 80% or lower than MD rate	AL, AZ, AR, FL, HI, IL, IN, IA, KS, KY, MD, MT, NV, NJ, ND, RI, SC

of monopoly. Birthing services are made, at least in some states, more complementary and less substitutable in the interests of integrated monopoly—a tactic long recognized in economic literature (McKie 1970).¹¹ There is also the strong possibility that physicians, once in charge of the certification board of CNMs, add credence as to the quality of certified midwifery along with lowered credence in lay midwives. (Our test includes the latter possibility.)

But the wide disparity in the strength of regulations—such as the significant difference in insurance reimbursement rates and the stringency of regulation generally across states—also reflect particular and, it would seem, effective consumer interest groups. Some of this effectiveness, again in particular locales, may be based on customs and practices of ethnic populations.¹² The theoretical model we select to analyze midwifery is a simple adaptation of supply and demand. As noted in the introduction, the credence characteristics of midwifery, whereby severe information problems mean that quality is unknown before and (sometimes) after the purchase (Darby and Karni 1973), can lead to “underconsumption” of the good. Price competition exacerbates that condition, and, in the “lemons” world of asymmetric information, higher-quality services may be driven from the market (Akerlof 1970). Occupational regulations, in this view, would have the effect of quality assurance, increasing the demand for midwife services and permitting quality enhancement.

The credence characteristic is of particular importance in the medical fields. An element of

¹¹ Our tests treat OB prices as independent of midwifery charges, however. A more elaborate test—given data availability, of course—would account for the possibilities of a “tar-baby” effect and their joint determination. Further, it would clearly be in the interest of both OBs and CNMs to pass regulations suppressing lay midwives. Our empirical findings support the fact that CNMs are substitutes for lay midwives.

¹² An interesting and valid avenue of inquiry—one not addressed in this paper—would be to explain why regulations are as they are in each of the 50 states. The state of Texas, for example, with a large Hispanic population that carry traditions of midwifery, would be expected to experience less stringent regulations on midwife practices. Our more limited concern, however, is with the effects of these regulations on efficiency and economic welfare once they are in place.

Table 2. Variable Names, Sample Means, and Descriptions

Variable Name	Sample Mean	Description
CNM BIRTHS	5.76%	CNM attended births as a percentage of total births in each of the 50 states for 1995.
MEDICAL BOARD AUTHORITY OVER CNM'S	0.14	Indicates the committee, board, or agency that regulates nurse-midwifery practice in a particular state. A dummy variable is used with a 1 indicating that CNMs are regulated by a board of medicine or a department of public health/board of health in a particular state. A value of 0 indicates that CNMs are regulated in a particular state by any of the following: board of nursing, board of nursing with board of medicine input, certified nurse-midwifery board, board of midwifery, or jointly by a board of nursing and a board of medicine.
CONTINUING EDUCATION	0.54	Indicates whether a state requires continuing education units for CNMs to renew their license to practice in that state. A dummy variable is used with a 1 indicating that the state requires this or a 0 indicating if it does not.
NO MANDATED INSUR. REIMBURSEMENT	0.40	Indicates whether a state mandates private insurance reimbursement for CNM services or if the state has enacted an "any willing provider" (AWP) law. A dummy variable is used with a 1 indicating that the state does not have this mandate or AWP law or a 0 indicating that it does have this mandate or AWP law.
CLINICAL PRIVILEGES NOT GUARANTEED	0.90	Indicates whether a state has enacted statutes that either permit hospitals to grant CNMs clinical practice privileges or prohibits hospitals from discriminating against CNMs in the granting of these privileges. A dummy variable is used with a 1 indicating that the state does not have either statute or a 0 indicating that it has one or the other statute.
NO PRESCRIPTIVE AUTHORITY	0.20	Indicates whether a state grants prescriptive authority to CNMs. A dummy variable is used with a 1 indicating that a state does not grant either full or limited prescriptive authority to CNMs or a 0 indicating that it does grant CNMs full or limited prescriptive authority.
CNM'S SUPERVISED BY MD'S	0.54	Indicates reduced support for CNM independence in a particular state. A dummy variable is used with a 1 indicating that a state's nurse-midwifery practice act includes, uses, or refers to (i) protocols rather than practice guidelines, (ii) terms such as "medical functions" or "delegated medical acts," or (iii) terms such as "supervision" or "direction" to describe the CNM's relationship with physicians. A 0 is used to indicate that CNMs have greater independence from physicians in a particular state.
LAY MIDWIVES NOT PERMITTED	0.28	Indicates whether lay midwives are allowed to practice in the state. A dummy variable is used with a 1 indicating that the state outlaws lay midwives or a 0 indicating if it does not.

Table 2. Continued

Variable Name	Sample Mean	Description
LOW CNM MEDICAID REIMBURSEMENT	0.34	Indicates the extent to which Medicaid reimburses CNMs for delivery services compared to physicians. A dummy variable is used with a 1 indicating that the Medicaid reimbursement rate for CNMs is 80% or lower than the physician reimbursement rate in a particular state. A 0 indicates that CNMs are compensated for delivery services by Medicaid at a rate higher than 80% of the physician reimbursement rate.
RATIO OF OBPRICE/HOSPCOSTS	.6867	The ratio of average obstetrician prices to average total hospital charges for an uncomplicated vaginal delivery in each of the 50 states for 1993, inflated to 1996 price levels by the medical cost of living index.
URBAN	68.18%	Percentage of the population that is urban in each of the 50 states.
REAL STATE PER CAPITA INCOME	22,384	State per capita income adjusted by the cost of living index for each state.
% HISPANIC POPULATION	5.2802%	Percentage of the population that is Hispanic in each of the 50 states.

"belief" that a correct quality and/or quantity of the good or service will be or has been obtained is demanded of the consumer. Moreover, for midwife services, as with many medical credence goods, such as brain surgery or psychiatry, the full cost of ultimately discovering a "mistake" is apt to be far higher than nominal costs to consumers. The level of quality assurance demanded may well be significantly higher for consumers of these goods than for goods of other types.¹³ If licensure and other forms of regulation are successful in improving quality, the demand for these services would be expected to increase.¹⁴ Nelson (1974) provides an important counterpoint to this view, arguing that, under certain conditions, regulation or "certification" of a good or service provides a false sense of security in the purchase leading to a high number of type II errors by consumers.

The well-known alternative view of regulation is that mandatory licensing through a political process restricts entry, competition, and consumer choice. Deleterious supply-side effects reduce consumer welfare and redistribute wealth to members of the occupation—in our case to OBs. Reduced supply would be engendered in this familiar scenario of the effects of more stringent occupational regulations on the scope of midwifery practice.

Predicted effects of the two models have both a common and a divergent characteristic. More stringent occupational regulations will lead to higher observed prices under both the supply-side and the demand-side hypotheses regardless of the level of credence characteristics of the occupation. But, as noted in the introduction, the two hypotheses diverge when predicting the quantity effects of more stringent occupational regulations, and it is at this point that the level of credence characteristics exhibited by the occupation come into play. The supply-side hypothesis suggests that more stringent occupational regulations reduce the quantity consumed of a particular service through a shift in supply, while the demand-side hypothesis suggests that the regulations increase the quantity consumed of the service by eliminating or reducing the low-quality/low-price sector of the market, thereby increasing the demand for the service. Our theoretical model is a test of the dominant, net effect of the alternative regulations on the licensing of nurse-midwives. The details of this simple test follow.

Structural Equations

To test the theoretical model empirically, a demand-and-supply model of CNM services is specified as follows:

$$Q_d = f(\text{CNMPRICE}, R_i, \text{URBAN}, \text{REAL STATE PER CAPITA INCOME}, \% \text{ HISPANIC POPULATION})^{15}$$

so that

¹³ Little empirical evidence has been produced in this area, but see Ekelund, Mixon, and Ressler (1995), where evidence is provided on relative intensities of information for credence and experience goods vis-à-vis search goods in Yellow Pages advertising. For some categories, such as child day care, chiropodists, optometrists, psychologists, and marriage/family counseling, information intensities (measured by licensing, certification, and other quality attributes) were not significantly different from "experience" goods but of (statistically) greater intensity than for search goods. This result was perhaps quite significant given the traditional prohibitions against advertising in "medical" fields.

¹⁴ Some evidence exists which links quality measures to what may be termed "credence" services. Carroll and Gaston (1981b) found that states with more restrictions in the legal profession had higher quality rankings. Holden (1978) found that higher failure rates on entry exams for dentists was associated with better service quality. However, Carroll and Gaston (1981a) found contrasting results for dentists.

¹⁵ The term R_i is a vector of restrictions, MEDICAL BOARD AUTHORITY OVER CNM'S, CONTINUING EDUCATION, NO MANDATED INSUR. REIMBURSEMENT, CLINICAL PRIVILEGES NOT GUARANTEED, NO PRESCRIPTIVE AUTHORITY, CNM'S SUPERVISED BY MD'S, LAY MIDWIVES NOT PERMITTED, LOW CNM MEDICAID REIMBURSEMENT, which is included in both the demand and the supply functions (see Table 1).

$$Q_d = \alpha_1 + \alpha_2$$

$$+ \alpha_{12} R_i$$

$$+ \varepsilon_d$$

$$\alpha_1 > 0, \alpha_2 < 0$$

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¹⁶ Leland (1981) and patient relative to medical services since the average of suggests it informative

$$Q_d = \alpha_1 + \alpha_2 \text{CNMPRICE} + \sum_{j=3}^{10} \alpha_j R_{j-2} + \alpha_{11} \text{URBAN} \\ + \alpha_{12} \text{REAL STATE PER CAPITA INCOME} + \alpha_{13} \% \text{ HISPANIC POPULATION} \\ + \varepsilon_d$$

$$\alpha_1 > 0, \alpha_2 < 0, \alpha_j > 0 \ (j = 3, \dots, 10), \alpha_{11} < 0, \alpha_{12} > 0, \alpha_{13} > 0 \quad (1)$$

and

$$Q_s = f(\text{CNMPRICE}, \text{POBPRICE}/\text{HOSPCOSTS}, R_i)$$

so that

$$Q_s = \gamma_1 + \gamma_2 \text{CNMPRICE} + \gamma_3 \text{OBPRICE}/\text{HOSPCOSTS} \\ + \sum_{j=4}^{11} \gamma_j R_{j-3} + \varepsilon_s$$

$$\gamma_1 < 0, \gamma_2 > 0, \gamma_3 < 0, \gamma_j < 0 \ (j = 4, \dots, 11) \quad (2)$$

The variables used in the model are defined in Table 2.

Demand Function (Q_d)

Following the law of demand, the quantity demanded of CNM services is assumed to be inversely related to the price of CNM services, CNMPRICE. The expected sign of the parameter α_2 is therefore negative. The term R_i is included in the demand function based on the quality certification demand-side hypothesis. This hypothesis suggests that more stringent regulations (discussed later) will increase the quantity demanded of CNM services at all price levels by eliminating the low-quality/low-price sector of the market.¹⁶ Therefore, the expected sign of the parameter α_j ($j = 3, \dots, 10$) is positive.

URBAN, the percentage of a state's population that lives in urban areas, is included in the demand function based on the assumption that higher population densities can support a wider variety of services, such as those provided by CNMs. Nurse-midwives have for decades provided care for underserved women in rural and inner city areas (American College of Nurse-Midwives 1994). Yet another study (Scupholme et al. 1992) concluded that twice as many CNMs (attending at least 22% of rural women) are practicing in rural areas than was reported in a limited Health and Human Services sample (Department of Health and Human Services 1992). Therefore, the expected sign of the parameter α_{11} is negative. REAL STATE PER CAPITA INCOME is included in the model on the assumption that CNM services are a normal good; the higher the income level, the greater the demand for these services, *ceteris paribus*, at any price level. Therefore, the expected sign of the parameter α_{12} is positive. % HISPANIC POPULATION is included in the model based on the assumption that the greater the number of Hispanics in a particular state, the greater the demand for CNM services, *ceteris*

¹⁶ Leland (1979) uses as an example the market for physicians, arguing that there is informational asymmetry between doctor and patient concerning the quality of medical services rendered. Since "patients . . . have difficulty in distinguishing the relative qualities of physicians . . . all doctors must therefore command the same fees, which will reflect the average quality of medical services. Doctors with above-average opportunities elsewhere may not be willing to remain in (or enter) the market, since the price they receive will reflect the lower average quality of service. Their withdrawal from the market lowers the average quality of medical services, the price falls, and further erosion of high-quality physicians occurs" (p. 1329). Leland suggests that licensing, or other forms of minimum quality standards, may be a relatively inexpensive way of eliminating this informational asymmetry resulting in the elimination of the low-quality/low-price sector of the market.

paribus, at all price levels. (Hispanics have a tradition of utilizing the services of midwives.) Therefore, the expected sign of the parameter α_{13} is positive.

Supply Function (Q_s)

Following the law of supply, the quantity supplied of CNM services is assumed to be directly related to own price, CNMPRICE, and hence the expected sign of the parameter γ_2 is positive. OBPRICE/HOSPCOSTS, the average OB price in a state as a percentage of hospital costs in that state, is included in the supply side of the model as a proxy for the cost of production. The hospital costs in each state includes room and board and all ancillary services for an uncomplicated vaginal delivery. The expected sign of the parameter γ_3 is therefore negative. The term R_i is included in the supply function based on the interest group supply-side hypothesis. This hypothesis suggests that regulations will decrease the quantity supplied of CNM services at all price levels by increasing the cost of entry to prospective CNMs. Therefore, the expected sign on each of the parameters γ_j ($j = 4, \dots, 11$) is negative.

4. Empirical Estimates

Appealing to simple supply-and-demand analysis, the quality-enhancing effect of regulation would shift the demand curve rightward, increasing equilibrium price and quantity. If supply restriction occurs, the supply curve shifts leftward, increasing equilibrium price and reducing quantity. Clearly reduced-form equations for price will not allow us to distinguish between the two hypotheses since restrictions increase price in both cases. However, in reduced-form quantity equations, a dominance of the supply effect will reduce quantity, while quality enhancement will positively affect quantity. We therefore concentrate on this fundamental equation.

From an econometric perspective, it should be clear that we wish to estimate a reduced-form quantity equation for CNM services. The parameters for the reduced-form quantity equation are purged of statistical biases resulting from the joint determination of prices and quantities and can therefore be estimated using ordinary least squares (OLS) (Gujarati 1988):

$$\begin{aligned} \text{CNMBIRTHS}_i = & \pi_1 + \pi_2 \text{ MEDICAL BOARD AUTHORITY OVER CNM'S}_i \\ & + \pi_3 \text{ CONTINUING EDUCATION}_i \\ & + \pi_4 \text{ NO MANDATED INSUR. REIMBURSEMENT}_i \\ & + \pi_5 \text{ CLINICAL PRIVILEGES NOT GUARANTEED}_i \\ & + \pi_6 \text{ NO PRESCRIPTIVE AUTHORITY}_i + \pi_7 \text{ CNM'S SUPERVISED BY MD'S}_i \\ & + \pi_8 \text{ LAY MIDWIVES NOT PERMITTED}_i \\ & + \pi_9 \text{ LOW CNM MEDICAID REIMBURSEMENT}_i \\ & + \pi_{10} \text{ OBPRICE/HOSPCOSTS}_i + \pi_{11} \text{ URBAN}_i \\ & + \pi_{12} \text{ REAL STATE PER CAPITA INCOME}_i \\ & + \pi_{13} \% \text{ HISPANIC POPULATION}_i + \varepsilon_i, \end{aligned} \quad (3)$$

where the variables are as defined in Table 2. Simple algebra and the hypothesized signs from the structural equations indicate that reduced form coefficients π_{10} through π_{13} are unambiguously positive or unambiguously negative. Reduced form coefficients on the regulatory variables, π_2 through π_9 , will be signed in accordance with which view dominates: positive if the demand side view

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dominates and negative if the supply side view dominates. The data for the quantity of CNM services, CNMBIRTHS, consist of a single observation for each of the 50 states in the survey.¹⁷

Estimation with Regulatory Sector Exogenous

Table 3 presents maximum likelihood estimates of the reduced-form quantity equation under two conditions: (i) when the regulatory sector is exogenous and (ii) when the regulatory sector is endogenous.

Cross-sectional studies often encounter problems with heteroscedasticity, and our results in Table 3 are no exception. Preliminary OLS estimates of the regulatory sector exogenous model indicated a Breusch-Pagan statistic of $\chi^2 = 16.96$, and preliminary instrumental variables (IV) estimates of the regulatory sector endogenous model revealed a Breusch-Pagan statistic of 8.03. Clearly, heteroscedasticity is a problem that we must address.

Traditionally, a generalized least squares (GLS) procedure in which the nonconstant variance is assumed to be proportional to, say, the square of some given explanatory variable is employed to attack this problem. Under this assumption, the GLS transformation amounts to simply weighting all variables by the reciprocal of the given variable. Recently, however, analysts have become more sophisticated in their assumptions concerning the form of the variance function. One popular assumption is one of "multiplicative heteroscedasticity," in which the logarithm of the nonconstant disturbance variance σ_i^2 is assumed to be a linear function of some key variables. Preliminary analysis of the relationship between the squared OLS residuals obtained from estimating Equation 3 and some potential explanatory variables suggested that, for our problem, a variance function of the form

$$\ln \sigma_i^2 = \phi_0 + \phi_1 \text{ STATE COST OF LIVING INDEX} \\ + \phi_2 \text{ STATE PER CAPITA INCOME IN 1995} + \zeta_i \quad (4)$$

might be appropriate.¹⁸ It is worth noting that estimating this variance function itself provides a direct test of heteroscedasticity: Statistically insignificant estimates of ϕ_1 and ϕ_2 imply a constant variance (estimated by the antilog of ϕ_0), and statistically significant estimates of ϕ_1 and ϕ_2 clearly indicate a nonconstant variance.

Greene (2000) shows that, since the Hessian of the likelihood function is block diagonal, maximum likelihood estimates of the π 's in Equation 3 and the ϕ 's in Equation 4 can be found through a simple iterative process. We begin by estimating Equation 3 by OLS. The logs of the squared residuals from Equation 3 are then used to proxy $\ln \sigma_i^2$ in Equation 4 so that the ϕ 's in that equation can then be consistently estimated by OLS.¹⁹ The antilog of the estimated variance function provides estimates of σ_i^2 that can be used to obtain GLS estimates of Equation 3. The log of the squared GLS residuals can then be used to new estimates of Equation 4, which can then be used to obtain new GLS estimates of Equation 3 and so on. The iterations continue until the estimates of both parameter vectors, π and ϕ , stabilize. This is the procedure that we used to obtain the parameter estimates presented in Table 3.

¹⁷ Data for this variable have been obtained from the Statistical Resources Branch Division of Vital Statistics of the U.S. Department of Health and Human Services for 1995. The data are for total CNM-attended births as a percentage of total births in each of the 50 states. Sources of other data are the Council of State Governments, the Census Bureau, the Department of Commerce, the Department of Labor, and the *Statistical Abstract of the United States* listed at the end of the references to this paper.

¹⁸ State cost of living indices are not as easy to find as one might think. The measure we use comes from a paper by Izraeli and Murphy (1997).

¹⁹ Technically, consistent estimation of the complete parameter vector ϕ requires adding a constant (1.2704) to the constant term.

Table 3. Reduced-Form Quantity Estimates (Assuming Multiplicative Heteroscedasticity)

Variable	Maximum Likelihood Estimates			
	Regulatory Sector Exogenous		Regulatory Sector Endogenous ^a	
	Coefficient	t-ratio	Coefficient	t-ratio
INTERCEPT	0.00134742	0.022466	-0.0738628	-1.1594
MEDICAL BOARD AUTHORITY OVER CNM'S	0.0448621	3.5665	0.0577459 ^b	4.30184
CONTINUING EDUCATION	0.00920926	1.32656	0.0142667 ^b	1.99793
NO MANDATED INSUR. REIMBURSEMENT	-0.02355	-3.06799	-0.0182948 ^b	-2.16778
CLINICAL PRIVILEGES NOT GUARANTEED	-0.0363571	-3.79327	-0.0391105 ^b	-2.85241
NO PRESCRIPTIVE AUTHORITY	-0.0149473	-1.70286	-0.00267303 ^b	-0.25134
CNM'S SUPERVISED BY MD'S	-0.0119984	-1.88629	-0.0412903 ^b	-5.84603
LAY MIDWIVES NOT PERMITTED	-0.0235863	-3.10315	-0.0299316 ^b	-3.68219
LOW CNM MEDICAID REIMBURSEMENT	0.00839065	1.12452	0.0100652 ^b	1.1973
RATIO OF OBPRICE/HOSPCOSTS	0.0615535	2.85874	0.0271361	1.32729
URBAN	-0.00123594	-3.00491	-0.00110181	-2.87024
REAL STATE PER CAPITA INCOME	0.000570785	1.93224	0.00102681	3.30707
% HISPANIC POPULATION	0.00172976	2.94605	0.00221497	4.0252
	Variance Function Estimates			
Sigma	0.000594417	1.10661	0.00296663	1.10661
State cost-of-living index	0.157043	5.18109	0.099501	3.2827
State per capita income	-0.00036956	-3.37809	-0.000274214	-2.50655
	Summary Statistics ^c			
N	50		50	
R ²	0.46		0.69	
$\chi^2(16)$	47.0844		67.0874	

^a Exogenous variables in the probit models used to determine the predicted values for the regulatory variables include hospital costs, percentage urban, state population (1995), political variables (the ratio of House size to Senate size, whether the state had a Republican governor, and the percentage of Democrats in the Senate), and variables indicating the size of competing interest groups (the number of midwives per capita and the percentage of total births conducted by MDs). The variable UNKNOWN was also included in the NOCLINPP probit in order to avoid perfect multicollinearity between its predicted value with the constant term.

^b The coefficients arise when we use the predicted values from the estimated probit equations outlined in note a as instrumental variables to avoid potential simultaneity problems.

^c Summary statistics: N is the sample size; R² is the coefficient of determination (its meaning is unclear in instrumental variables models); $\chi^2(16)$ is the statistic for testing the joint significance of the slope coefficients (its critical value for 16 degrees of freedom at the 5% level of significance is 26.2923).

The signs on the coefficient estimates in Table 3 conform to our *a priori* expectations. When the regulatory sector is assumed exogenous, only two of the eight regulatory variables are statistically insignificant, CONTINUING EDUCATION and LOW CNM MEDICAID REIMBURSEMENT, while all four of the nonregulatory variables are statistically significant at traditional levels. These results are not totally satisfactory, however. Sass and Sauman (1995) make a convincing argument that in models such as the one we posit here, the licensing variables are likely to be jointly determined with price and quantity. If this is the case, our reduced-form coefficient estimates in Table 3 (regulatory sector exogenous) are biased and inconsistent. It is therefore essential that we test for the presence of an endogenous political sector. The test introduced by Hausman (1978) has become the standard for evaluating such questions. But Hausman's test requires instruments for the political variables. While there are numerous approaches to obtaining "acceptable" instruments, they are

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available on a systematic basis only from estimated political models. Thus, we adopt the following procedure to create our instruments.

We begin by supposing that the parameters of the structural equations explaining MEDICAL BOARD AUTHORITY OVER CNM'S, CONTINUING EDUCATION, NO MANDATED INSUR. REIMBURSEMENT, CLINICAL PRIVILEGES NOT GUARANTEED, NO PRESCRIPTIVE AUTHORITY, CNM'S SUPERVISED BY MD'S, LAY MIDWIVES NOT PERMITTED, and LOW CNM MEDICAID REIMBURSEMENT are jointly determined in an eight-equation system.²⁰ In principle, these eight equations are part of a larger (10-equation) system that also determines the price and quantity of CNM services. But since we are interested only in whether potential endogeneity of the regulatory variables with equilibrium quantity of CNM service biases the reduced-form coefficient estimates of Table 3, we need to construct instruments only for the eight regulatory variables. Thus, we confine our attention to the smaller system composed of the eight structural equations explaining these regulatory variables.

In any event, we make no attempt to precisely specify any of these structural relationships; there is no need. Recalling that the criteria for an "appropriate" instrument are that it be highly correlated with the variable it purports to measure and uncorrelated with the corresponding disturbance, the reduced-form equations of the system are sufficient to generate satisfactory instruments for the regulatory variables, as is the case in typical two-stage least squares procedures. Consequently, we estimate probit regressions explaining each of the eight regulatory variables with (the same) nine independent variables using data for the 50 states included in our sample (i.e., $N = 50$). Specifically, the nine explanatory variables include the percentage of the state's senate and of the state's house held by the Democratic Party, the ratio of the state's house to the state's senate, the political party of the governor, the average hospital charges for an uncomplicated vaginal delivery in each state, the percentage of the state's population that lives in urban areas, the number of CNMs per capita, physician deliveries as a percentage of total deliveries in each state, the state's population in 1995, and a constant term. These variables can be taken as all the exogenous variables in the regulatory equation system; all that is required is that each one enters at least one of the eight structural equations. As such, the eight estimated equations comprise the reduced-form equations of the structural system. The predicted values of the dependent variable in each probit regression become the instruments for the corresponding regulatory variables to be used in the reduced form for CNMBIRTHS to perform the Hausman test for endogeneity.

Before turning to the conduct, outcome, and implications of this test, we note that all the explanatory variables in the reduced forms are well grounded in a public choice approach to modeling the supply and demand for CNM regulations.²¹ Each variable is a measure of the extent to which some factor affects the incentives of legislators to bargain among themselves, the accountability of legislators to the public, or the size of some interest group that might wish to influence

²⁰ Assuming that the political variables are (contemporaneously) jointly determined may gloss over some important dynamics intrinsic to the implied relationships. Both legislative and constitutional values change over time, the latter far less frequently. Unfortunately, no adequate or well-specified model of regulatory change yet exists with which to explain institutional evolution. While we look forward to such a model, a potential gap in our specification is that we use current rather than original magnitudes to explain our regulatory variables in our subsequent reduced-form regressions. Legislators can modify (or eliminate) regulations if they choose, but cost levels suggest that licensing requirements change infrequently. Our use of current values implicitly suggests that legislative change is costless. In that sense, we assume away potentially important problems.

²¹ A more complete description of the explanatory variables (along with sample means) and the empirical results from estimating the regulatory reduced-form equations (accompanied by a behavioral analysis of the results) is available from the authors on request.

regulation-related legislation. Previous studies have found these types of variables significant in explaining the existence of various regulations.²²

Our point is that it is quite possible to specify a set of reduced-form equations, well grounded in theory and precedence, without specifically positing the underlying structural system. Since our sole object in developing a political model is to obtain legitimate instruments for the regulatory variables in our CNM market model, we choose to follow this course of action.

Estimation with Regulatory Sector Endogenous

Table 3 (regulatory sector endogenous) presents IV estimates of Equation 5 using the instruments for the political variables developed in the previous section. Based on the OV (omitted variables) version of the Hausman test (Kennedy 1992), the test statistic was a chi-square (8) of 52.4828. This exceeds the critical value of a chi-square (8) at the .05 level of 15.5073. Therefore, the null hypothesis of consistent estimation of the parameters of the reduced-form quantity equation is rejected at any reasonable level. This result suggests that our initial estimates of the quantity equation must be corrected for simultaneity bias. Therefore, we now shift our focus to the IV estimates.

Our results for the quantity equation bear directly on the competing demand- and supply-side hypotheses concerning the effects of CNM regulations. The result for the nonregulatory variable OBPRICE/HCOSTS suggests that the higher the ratio of OB prices to total hospital costs, the higher the quantities consumed of CNM services, although the parameter estimate is not statistically significant. Higher income levels and the greater the percentage of a state's population that is Hispanic have a positive effect on the number of CNM deliveries. The parameter estimates for both of these variables, REAL STATE PER CAPITA INCOME and % HISPANIC POPULATION, are positive and significant at the .01 level. For each thousand-dollar increase in real per capita income in a state, CNM deliveries increase by about 1 percentage point, or about 18%.²³ In addition, for each percentage-point increase in the Hispanic population in a state, CNM deliveries increase by approximately .22 percentage points, or about 4%.

The parameter estimates for two of the eight regulatory variables, NO PRESCRIPTIVE AUTHORITY and LOW CNM MEDICAID REIMBURSEMENT, are not statistically significant. It appears that allowing CNMs either full or limited prescriptive authority in a particular state has no bearing on the number of CNM deliveries in each state. A low level of Medicaid reimbursement for CNMs, as compared to physicians, also appears to have no effect on the number of CNM deliveries in each state.

The parameter estimates of the regulatory variables MEDICAL BOARD AUTHORITY OVER CNM'S and CONTINUING EDUCATION support the demand-side hypothesis. Both parameter estimates are positive and are statistically significant at the .01 and the .05 level, respectively. If CNMs are supervised by a regulatory board other than a board of nursing, midwifery, or certified nurse midwifery or a board that includes nurses or has nurse input, then the number of CNM deliveries roughly doubles in that particular state. As suggested earlier, this regulation (as measured by our variable) provides "credence" to the services of CNMs while simultaneously reducing perceived quality of lay nurse-midwives. Requiring CNMs to enhance their practice skills through

²² For example, McCormick and Tollison (1981) found that variables such as the size of the legislature, the relative size of the two houses, and the percentage of the population living in urban areas affect the ease with which special interests can accomplish their lobbying goals. Jackson, Saurman, and Shughart (1994) showed that election term length affects legislative action to institute legal change. Maurizi (1974) and Graddy and Nichol (1989) found that state occupational licensing board members have an influence on the legislative process.

²³ Recall from Table 2 that CNMBIRTHS are 5.76% of total births so that a 1-percentage-point increase would amount to an 18% increase in CNMBIRTHS. Subsequent analysis makes use of this type of calculation.

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continuing education requirements for license renewal increases CNM deliveries by approximately 1.4 percentage points, or 29%, compared to those states that do not have such requirements.

The parameter estimates of the four remaining regulatory variables, NO MANDATED INSUR. REIMBURSEMENT, CLINICAL PRIVILEGES NOT GUARANTEED, CNM'S SUPERVISED BY MD'S and LAY MIDWIVES NOT PERMITTED are all negative in sign and statistically significant at either the .05 or the .01 level. The signs and significance of these estimates lend support to the supply-side hypothesis. Private insurance reimbursement mandates or AWP laws increase CNM deliveries by about 1.8 percentage points, or 40%, compared to those states that have no such mandates. Both the guarantee of hospital admitting privileges to CNMs and their ability to practice independently of physicians have a dramatic impact on the number of CNM deliveries in a particular state, resulting in an increase in CNM deliveries of approximately 73% and 109%, respectively.²⁴ The ban on the practice of lay midwifery results in a decrease in CNM deliveries of about 3 percentage points, or about 46%, compared to those states that do not ban this practice. While this seems contrary to *a priori* expectations, as lay midwives can be viewed as competitors to CNMs, it appears that this variable is a proxy for the tendency to oppose midwife practice (both lay and CNM) in general in a particular state.

5. Summary and Conclusion

The theory and empirical model developed in this paper analyzes the theoretical effects of regulation through supply and demand on prices and quantities and develops an empirical model to analyze the quantity of CNM services. Regulation of CNMs is a specific case of regulation that must be analyzed and interpreted relative to the regulation of OBs. Since the use of either supply-side (Stigler-Peltzman) or demand-side (quality assurance) hypotheses predicts higher prices from increased regulation of CNMs, we focus on the quantity effects from increased regulation.

The two hypotheses diverge in their predictions concerning the effects of increased regulation of CNMs when it comes to the quantities consumed of CNM services. Our results suggest that the supply-side (quantity-reducing) effects dominate the demand-side (quality assurance and quantity enhancement) effects. When evaluated at their respective means and at their sample minimums, the resulting effect of minimum regulations versus mean regulations on CNMs is to increase the percentage of CNM births from approximately 5.76% to 11.12% of all births in the 50 states. The results support the hypothesis that the more restrictive a state's statutes concerning CNM regulations, that is, those that reduce parity with OBs, the less will be the quantities consumed of those services in that state. Although CNM services can clearly be regarded as having some fairly significant credence characteristics—and these effects are important to exchange in the CNM market—it appears that regulation of this type of service has detrimental consumer welfare effects.²⁵ In a time when many medical service delivery systems are in chaos, the advantages to deregulation of such fundamental activities should not be minimized.

²⁴ These increases, percentage-point-wise, are 3.9 and 4.1, respectively.

²⁵ Price equations were estimated, in part by using phone survey data, in preparatory econometric modeling for this study. In a supply-and-demand model, we found that when all regulatory variables (seven in that model) were evaluated at their respective means and at their sample minimums, the resulting effect of mean regulations (average price at about \$2041) versus minimum regulations (average price about \$1149) on CNMs is to decrease the average price of CNM services for an uncomplicated vaginal delivery by about \$892, roughly a 44% decrease. Losses to CNMs and consumers as a result of mean regulations versus minimum regulations are approximately \$184 million per year with deadweight losses estimated at \$6.5 million per year. While small, such deadweight losses are not unexpected given the lowered price sensitivity engendered by third-party payments. These results are available from the authors on request.

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**Midwifery care, social and medical risk factors,
and birth outcomes in the USA**

Marian F MacDorman, Gopal K Singh

*(Reprinted from JOURNAL OF EPIDEMIOLOGY & COMMUNITY HEALTH, May 1998,
Vol 52, No 5, p 310-317)*

Midwifery care, social and medical risk factors, and birth outcomes in the USA

Marian F MacDorman, Gopal K Singh

Abstract

Study objective—To determine if there are significant differences in birth outcomes and survival for infants delivered by certified nurse midwives compared with those delivered by physicians, and whether these differences, if they exist, remain after controlling for sociodemographic and medical risk factors.

Design—Logistic regression models were used to examine differences between certified nurse midwife and physician delivered births in infant, neonatal, and postneonatal mortality, and risk of low birthweight after controlling for a variety of social and medical risk factors. Ordinary least squares regression models were used to examine differences in mean birthweight after controlling for the same risk factors.

Study setting—United States.

Patients—The study included all singleton, vaginal births at 35–43 weeks gestation delivered either by physicians or certified nurse midwives in the United States in 1991.

Main results—After controlling for social and medical risk factors, the risk of experiencing an infant death was 19% lower for certified nurse midwife attended than for physician attended births, the risk of neonatal mortality was 33% lower, and the risk of delivering a low birthweight infant 31% lower. Mean birthweight was 37 grams heavier for the certified nurse midwife attended than for physician attended births.

Conclusions—National data support the findings of previous local studies that certified nurse midwives have excellent birth outcomes. These findings are discussed in light of differences between certified nurse midwives and physicians in prenatal care and labour and delivery care practices. Certified nurse midwives provide a safe and viable alternative to maternity care in the United States, particularly for low to moderate risk women.

(*J Epidemiol Community Health* 1998;52:310–317)

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Accepted for publication
26 August 1997

Currently the United States ranks 22nd in the world in infant mortality, behind such other countries as Japan, Singapore, Finland, Sweden, and Switzerland. In 1992, the infant mortality rate for number one ranked Japan was 4.5 infant deaths per 1000 live births, nearly half the rate of 8.5 for the United States.¹

Despite skyrocketing health care expenditures for obstetric and neonatal care (estimated

at \$26.5 billion in 1987,² up from \$16 billion in 1985³), numerous barriers in access to prenatal and perinatal care still exist for many pregnant women.^{3–5} This is reflected in the fact that only 76% of women in 1991 began prenatal care in the first trimester, a proportion that had been essentially unchanged since 1979.⁶ This proportion increased to 80% in 1994.⁷ Many studies have focused on ways to reduce the infant mortality rate in the US while controlling costs, expanding coverage, and improving the quality of prenatal and perinatal care.^{2–5, 8, 9}

A number of studies have advocated the increased involvement of midwives in US maternity care, as women whose pregnancies are managed by midwives generally receive excellent care with lower rates of costly medical interventions such as caesarean section, vacuum and forceps deliveries, induction of labour, ultrasound, and continuous fetal monitoring.^{2, 10–17} The number of births delivered by midwives has increased rapidly in recent years, from 29 413 (0.9%) in 1975^{18, 19} to 182 461 (4.4%) in 1991 and 218 466 (5.5%) in 1994.²⁰ Of these births the per cent born in hospital has increased from 67% in 1975 to 88% in 1991 and 90% in 1994. For certified nurse midwives, the proportion is even higher—more than 94% of all certified nurse midwife delivered births in 1991 were born in hospitals (95% in 1994). With increased hospital privileges and more active collaborative arrangements with physicians, certified nurse midwives have been able to offer their services to a more diverse group of women. A recent national study has demonstrated that the overall risk profile for births delivered by certified nurse midwives in hospital is similar to the risk profile for physician delivered hospital births.²⁰ In addition, certified nurse midwives tend to handle a higher proportion of women in certain sociodemographic risk categories, such as teenage mothers, those living in poverty, women who have not completed high school, and ethnic minorities.^{2, 20–23}

This study compares birth outcomes and infant mortality rates for births in the United States delivered by physicians (MDs and DOs) and certified nurse midwives. Births delivered by other midwives are excluded because of the small percentage of overall births (0.4%), and also because of the diverse backgrounds and training of midwives in this group caused in part by large variations in state law regarding the training and licensing of other midwives.²⁴ The purpose of this study is to examine whether there are significant differences in birth outcomes for infants delivered by certified nurse midwives compared with those

Table 1 Characteristics of physician and certified nurse midwife delivered births: United States, 1991

	All deliveries		Singleton, vaginal deliveries 35-43 weeks gestation	
	Physician	Certified nurse midwife	Physician	Certified nurse midwife
Number of births	3892192	167706	2634550	153194
Per cent of total births*	94.7	4.1	93.2	5.4
Infant mortality rate†	8.8	4.1	3.6	3.1
Neonatal mortality rate‡	5.6	1.6	1.2	0.8
Postneonatal mortality rate‡	3.2	2.5	2.4	2.3
Low birthweight (<2 500 g) (%)	7.3	3.2	3.5	2.5
Mean birthweight	3333	3404	3390	3416
Preterm birth (%)	11.0	7.2	6.0	5.0
Mean weeks of gestation	39.1	39.5	39.4	39.5
Delivered in hospital (%)	99.7	94.3	99.6	94.1
Single births (%)	97.5	99.6	100.0	100.0
Vaginal deliveries (includes vaginal births after caesarean section) (%)	76.2	99.4†	100.0	100.0
Non-Hispanic white (%)	64.5	51.4	65.3	52.0
Non-Hispanic black (%)	16.3	18.8	15.5	18.4
Asian and Pacific Islander (%)	3.5	3.7	3.7	3.7
American Indian (%)	0.9	3.1	0.9	3.1
Hispanic (%)	14.9	23.1	14.8	23.0
Maternal age <20 years (%)	12.7	17.2	13.3	16.9
Maternal age 35+ years (%)	9.4	8.3	8.6	8.5
Birth order 4+ (%)	10.4	12.9	10.7	12.8
Unmarried (%)	29.1	38.5	29.0	38.0
Smokers (%)	17.8	18.3	17.7	18.0
Maternal education <12 years (%)	23.3	32.3	23.6	31.8
Maternal education 16+ years (%)	18.3	14.3	18.4	14.8
Prenatal care began in 2nd or 3rd trimester (%) or no care	23.1	34.2	23.1	33.4
No prenatal care (%)	1.8	2.2	1.7	2.0
Medical risk factors/delivery complications				
Abruptio placenta (%)	0.6	0.2	0.2	0.1
Breech/malpresentation (%)	4.0	0.4	0.5	0.3
Fetal distress (%)	4.4	1.7	2.1	1.6
Hydramnios/oligohydramnios	0.7	0.5	0.5	0.5
Precipitous labour (<3 hours) (%)	1.8	2.8	2.2	2.8
Premature rupture of membrane (>12 hours) (%)	3.3	3.4	2.4	3.3
Seizures during labour (%)	0.04	0.02	0.02	0.02

Missing data were excluded when computing percent distributions. Source: National Linked Birth/Infant Death data set, 1991 birth cohort. *An additional 51 161 births or 1.2% of the total were delivered by attendants other than physicians and certified nurse midwives. These included other midwives (0.4%), and other and unknown persons. †Rate per 1000 live births. ‡In 1991, 959 births were reported with attendant at birth as certified nurse midwives and method of delivery as caesarean section. These probably refer to births where the initial attendant was a certified nurse midwife, but because of complications the birth had to be transferred to a physician to perform a caesarean section, and the attendant item on the birth certificate was not updated. As the multivariate analysis is limited to vaginal deliveries, the results of the study are not affected.

delivered by physicians, and whether these differences, if they exist, remain even after controlling for sociodemographic and medical risk factors.

Methods

DATA

This study uses data from the national linked birth/infant death data set for the 1991 birth cohort. In this data set, the death certificate is linked with the corresponding birth certificate for each infant who dies in the United States. The purpose of the linkage is to use the many additional variables available from the birth certificate in infant mortality analysis. Information on all of the approximately 4 million live births in the US each year is also included. For the 1991 birth cohort, 97.7% of US infant death certificates were successfully matched to their birth certificates.²⁵

The descriptive analysis examines all US births as well as singleton, vaginal deliveries at 35-43 weeks gestation, to provide a comparison group between the US population as a whole, and the subset of this population used for the logistic and ordinary least squares (OLS) regression models. For the logistic and OLS regression models, the analysis was restricted to singleton, vaginal deliveries at 35-43 weeks gestation. As certified nurse midwives do not

perform caesarean sections and perform fewer multiple deliveries than physicians (table 1), limiting the analysis to singleton, vaginal deliveries provided a more meaningful comparison of outcomes between physician and certified nurse midwife delivered births. A period of gestation of 35-43 weeks includes all term births as well as those ± 2 weeks from term. Although midwifery protocols vary, in general women who present in labour at gestational ages remote from term are transferred to physician care.^{16 26-28} The restriction of the multivariate analysis to 35-43 weeks of gestation was carried out to minimise possible bias resulting from high rates of patient transfer at gestational ages remote from term, and to provide a comparison group of physician delivered births that would be more similar to the types of cases midwives typically handle.

A sample of births was used for the multivariate analysis, as it is impractical and costly (in terms of computer processing time) to perform a multivariate regression analysis on all 4.1 million birth records given that this large a data set is not needed to explore the required statistical relations. Thus a smaller data set was created which included 100% of the eligible certified nurse midwife delivered births (153 194), together with a 25% random sample of physician delivered births (686 644).

VARIABLES

The dependent variables in this study were infant, neonatal, and postneonatal mortality, low birthweight, and mean birthweight. Differences in these five dependent variables were modelled as functions of sociodemographic, health, and medical risk factors and complications. Sociodemographic and health risk factors examined included birth attendant, maternal age, race, education, marital status, birth order, month of pregnancy prenatal care began, and gestational age. Medical risk factors and complications refer to a number of new checkbox items added to the US birth certificate in 1989, eliciting information on medical risk factors of the pregnancy and complications of labour or delivery, or both. Only those risk factors that had a statistically significant effect on birth outcomes were included in the models. Factors included were hydramnios/oligohydramnios, abruptio placenta, breech/malpresentation, fetal distress, precipitous labour (<3 hours), premature rupture of membrane (>12 hours), and seizures during labour. All variables were measured as categorical variables as shown in table 2.

Data on birth attendant comes from the "Attendant's name and title" item from the birth certificate, and is designed to elicit the name and title of the person who actually delivered the baby. The person who provided the prenatal care may or may not be the same person, although in many instances they are one and the same. Under reporting of midwife attended births has also been found, particularly among midwives who work for physicians. About six per cent of certified nurse midwives who attended births reported that they were not listed as the birth attendant on the birth certificate.²⁹

All variables were reported by all US states except for maternal education and maternal smoking during pregnancy. In 1991, data on maternal educational attainment was reported for all areas except Upstate New York (excluding New York City) and Washington State. These two areas taken together comprised 5.8% of total US births. Data on maternal smoking during pregnancy was reported for all areas except California, Indiana, New York, and South Dakota (26.9% of total US births). For educational attainment, separate multivariate analyses were conducted excluding the non-reporting states, and including all US states, but with missing values for maternal education coded to a separate covariate category. As the results from the two analyses were very similar, it was decided to include all US states in the final analysis. For the smoking variable, the per cent of records with unknown responses was deemed to be too high, and the variable was excluded from the final multivariate analyses, although it was included in preliminary analyses (data not shown). As the proportion of women who smoked during pregnancy was quite similar between the physician and certified nurse midwife groups, the exclusion of this variable from the final analysis did not significantly change the relations

KEY POINTS

- Adjusted infant and neonatal mortality odds ratios were lower for certified nurse midwife than for physician delivered births.
- The risk of low birthweight was lower, and mean birthweight was higher for certified nurse midwife than for physician delivered births.
- Differences between physicians and certified nurse midwives in prenatal, labour, and delivery care practices may explain in part the differential outcomes.

between birth attendant and birth outcomes shown below.

Although the quality of data reported on birth certificates is generally considered to be quite reliable, questions have been raised about data accuracy for a few specific variables. Although questions have been raised in the past about the quality of gestational age data from birth certificates,³⁰ data quality has improved substantially since 1989 when a separate item on clinical estimate of gestation was added to the birth certificate, and a consistency check between period of gestation computed from the date of last menstrual period, period of gestation based on the clinical estimate, and birthweight was implemented.³¹ Because of these and other measures, the per cent of birth records with not stated gestational age fell from 4.3% in 1988 to 1.0% in 1991,³² and records with highly implausible values (that is, 20 weeks gestation and 4000 grams birthweight) have been either corrected or assigned to not stated.³¹ Any remaining inaccuracies are unlikely to be differentially reported by birth attendant.

Studies comparing the reporting of the checkbox items on medical risk factors and complications of labour/delivery to medical records have found substantial under reporting of these variables.³²⁻³⁵ However, all of these studies were conducted within the first year or two of the implementation of the new birth certificate, and some authors felt that reporting was likely to improve as medical personnel became more familiar with the new form.³¹ Still, some degree of under reporting of these items is likely in the current analysis. However, as the birth certificates for hospital deliveries, which comprise the vast majority of physician and certified nurse midwife births, are probably filled out by the same medical records staff regardless of birth attendant, there is no evidence to support the notion of substantial bias between physician and certified nurse midwife groups in completeness of reporting of these items.

STATISTICAL METHODS

Multivariate logistic regression was used to examine the risk of infant, neonatal, and postneonatal mortality and low birthweight for singleton, vaginal births at 35-43 weeks gestation delivered by physicians and certified nurse

midwives, while controlling for sociodemographic and medical risk factors. Ordinary least squares regression was used to examine birthweight differences for births delivered by physicians compared with certified nurse midwives, while controlling for the same sociodemographic, health and medical risk factors, and complications. The parameters in the logistic model were estimated by the maximum likelihood method using the LOGISTIC procedure; those in the ordinary least squares

model were estimated using the REG procedure of SAS, Version 6.

For each of the five dependent variables, three sets of regression models are presented. Model 1 presents the unadjusted odds ratios for each of the predictors (including birth attendant). Model 2 shows the effect of birth attendant when race/ethnicity, maternal age, birth order, marital status, maternal education, prenatal care, and gestational age are included in the model. Model 3 shows the adjusted dif-

Table 2 Logistic regressions showing crude and adjusted differentials in risk of infant mortality between physician and certified nurse midwife delivered singleton, vaginal births 35–43 weeks gestation: United States, 1991 (n=810 790)

Covariate	Model 1†		Model 2‡		Model 3§	
	OR	95% CI	OR	95% CI	OR	95% CI
Attendant at delivery						
Physician	1.00		1.00		1.00	
Certified nurse midwife	0.87	(0.73, 1.03)	0.80*	(0.67, 0.95)	0.81*	(0.68, 0.96)
Race/ethnicity						
Non-Hispanic White	1.00		1.00		1.00	
Black	1.71**	(1.56, 1.87)	1.12*	(1.01, 1.24)	1.13*	(1.02, 1.25)
American Indian	2.03**	(1.58, 2.60)	1.54**	(1.17, 2.01)	1.52**	(1.16, 1.99)
Asian	0.97	(0.78, 1.20)	0.92	(0.75, 1.14)	0.94	(0.76, 1.16)
Hispanic	0.93	(0.83, 1.04)	0.67**	(0.59, 0.75)	0.68**	(0.61, 0.77)
Maternal age, (y)						
<20	1.67**	(1.53, 1.84)	1.33**	(1.19, 1.49)	1.35**	(1.21, 1.51)
20–34	1.00		1.00		1.00	
35+	0.90	(0.78, 1.03)	0.90	(0.78, 1.04)	0.89	(0.77, 1.03)
Live birth order						
1	0.75	(0.69, 0.81)	0.65**	(0.60, 0.71)	0.65**	(0.59, 0.70)
2–3	1.00		1.00		1.00	
4+	1.31**	(1.17, 1.45)	1.19**	(1.06, 1.32)	1.18**	(1.06, 1.32)
Unknown	1.18	(0.68, 2.04)	1.01	(0.58, 1.74)	1.00	(0.58, 1.73)
Marital Status						
Married	1.00		1.00		1.00	
Unmarried	1.81**	(1.68, 1.95)	1.32**	(1.21, 1.45)	1.31**	(1.20, 1.44)
Maternal education, (y)						
0–11	1.48**	(1.36, 1.61)	1.28**	(1.16, 1.41)	1.28**	(1.16, 1.40)
12	1.00		1.00		1.00	
13+	0.63**	(0.57, 0.70)	0.73**	(0.66, 0.81)	0.73**	(0.66, 0.81)
Unknown	3.27**	(1.20, 1.74)	1.42**	(1.18, 1.71)	1.39**	(1.15, 1.67)
Prenatal care began						
In trimester	1.00		1.00		1.00	
Late or no prenatal care	1.66**	(1.53, 1.79)	1.27**	(1.17, 1.38)	1.26**	(1.16, 1.37)
Unknown	1.42**	(1.19, 1.70)	1.34	(1.06, 1.70)	1.32*	(1.04, 1.67)
Gestational age						
35–36 weeks	3.05**	(2.74, 3.40)	2.61**	(2.34, 2.91)	2.50**	(2.23, 2.79)
37–38 weeks	1.53**	(1.40, 1.67)	1.45**	(1.32, 1.58)	1.43**	(1.31, 1.56)
39–41 weeks	1.00		1.00		1.00	
42–43 weeks	1.24**	(1.09, 1.42)	1.16*	(1.01, 1.33)	1.15	(1.00, 1.32)
Hydramnios/oligohydramnios						
No	1.00				1.00	
Yes	5.99**	(4.74, 7.56)			5.07**	(4.00, 6.43)
Unknown	0.99	(0.84, 1.16)			1.02	(0.85, 1.21)
Abruptio placenta						
No	1.00				1.00	
Yes	4.05**	(2.76, 5.94)			2.83**	(1.92, 4.17)
Unknown	1.15	(0.86, 1.54)			1.19	(0.84, 1.68)
Breech/malpresentation						
No	1.00				1.00	
Yes	3.50**	(2.64, 4.64)			3.21**	(2.42, 4.25)*
Unknown	1.15	(0.86, 1.55)				
Fetal distress						
No	1.00				1.00	
Yes	1.69**	(1.37, 2.07)			1.59**	(1.29, 1.96)
Unknown	0.99	(0.86, 1.13)			1.00	(0.85, 1.17)
Precipitous labour (<3 hours)						
No	1.00				1.00	
Yes	1.52**	(1.24, 1.86)			1.25	(1.02, 1.54)*
Unknown	1.15	(0.86, 1.55)				
Premature rupture of membrane (>12 hours)						
No	1.00				1.00	
Yes	1.50**	(1.23, 1.82)			1.28*	(1.05, 1.57)*
Unknown	1.15	(0.86, 1.55)				
Seizures during labour						
No	1.00				1.00	
Yes	5.06**	(1.75, 14.58)			4.65**	(1.61, 13.48)*
Unknown	1.14					
Model χ^2			1013.34**		1238.81**	
df			19		29	

OR=odds ratio; CI=confidence intervals; *p ≤ 0.05; **p ≤ 0.01. Source: National Linked Birth/Infant Death Data Set, 1991 birth cohort. †Unadjusted for the effects of other covariates. ‡Adjusted for the effects of attendant at delivery, maternal age, race/ethnicity, marital status, education, live birth order, prenatal care, and gestation. §Adjusted for the effects of attendant at delivery, maternal age, race/ethnicity, marital status, education, live birth order, prenatal care, gestation, and medical risk factors. ¶The unknown categories for breech/malpresentation, meconium moderate/heavy, precipitous labour, premature rupture of membrane, and seizures during labour were a linear combination of the unknown category for abruptio placenta and were set to 0 in Model 3.

ferentials in outcomes between physician and certified nurse midwife delivered births, when the medical risk factors and complications are included in addition to all of the covariates included in Model 2.

Results

Table 1 shows the characteristics of US births by attendant at delivery. Overall, 94.7% of US births in 1991 were delivered by physicians, 4.1% by certified nurse midwives, 0.4% by other midwives, and 0.8% by other and unknown attendants. Certified nurse midwives delivered 94.3% of their births in hospital compared with 99.7% for physicians. The infant mortality rate was 53.4% lower for births delivered by certified nurse midwives than for births delivered by physicians, although this differential was reduced to 13.9% when the analysis was restricted to singleton, vaginal deliveries at 35–43 weeks of gestation. This subgroup included 67.7% of the physician attended births and 91.3% of the midwife delivered births in the US.

The per cent of low birthweight and preterm births was substantially higher for physician than for certified nurse midwife deliveries although the difference was greatly reduced when only singleton vaginal deliveries at 35–43 weeks of gestation were examined. For this subgroup, mean birthweight was 26 grams higher, and mean gestational age 0.1 week longer for certified nurse midwife than for physician deliveries.

When the sociodemographic characteristics of births are examined, a greater percentage of certified nurse midwife than physician deliveries involve mothers who are at increased risk for poor birth outcomes. A higher proportion of the certified nurse midwife deliveries occur among black women, American Indians, teenagers, women with three or more previous births, unmarried women, those with less than a high school education, and those with late or no prenatal care. Certified nurse midwives also attended a higher percentage of births to Hispanic origin mothers than did physicians. These mothers generally have relatively good outcomes despite a higher prevalence of sociodemographic risk factors.^{16, 17}

When the medical risk profile of physician and certified nurse midwife delivered births was examined, physicians attended more births with abruptio placenta, breech/malpresentation, fetal distress and hydramnios/oligohydramnios, while certified nurse midwives attended more women with precipitous labour and premature rupture of membrane. However, these differentials were greatly reduced when the analysis was restricted to singleton, vaginal deliveries 35–43 weeks of gestation. For this group, physicians attended a slightly higher proportion of births with abruptio placenta, breech/malpresentation, and fetal distress, while certified nurse midwives attended a slightly higher percentage of births with precipitous labour, and premature rupture of membranes.

DIFFERENTIALS IN INFANT MORTALITY

Table 2 shows the results of logistic regression analyses examining the effect of birth attendant and other covariates on infant mortality. In Model 1 the unadjusted risk of infant mortality was 13% lower for births delivered by certified nurse midwives than for births delivered by physicians. However, when the sociodemographic variables were controlled for in Model 2, the difference in infant mortality risk between physician and certified nurse midwife deliveries actually increased to 20% (that is, the risk of infant mortality was 20% lower for certified nurse midwife delivered births). This probably relates to the higher sociodemographic risk profile of the certified nurse midwife attended group (see table 1). In Model 3, this differential between certified nurse midwife and physician infant mortality risk was reduced to 19%, reflecting the slightly higher medical risk profile of physician attended births.

At the suggestion of an anonymous reviewer, an additional model was computed with terms for very low birthweight (<1500 g) and moderately low birthweight (1500–2499 g) substituted for the period of gestation terms in table 2-Model 3. Results were similar to those shown in table 2-Model 3 (odds ratio=0.83, 95% confidence intervals = 0.70, 0.98). As period of gestation is conceptually antecedent to birthweight, and as the models yielded similar results, the model shown in table 2 was retained in the final analysis.

When the effects of the other covariates on infant mortality were examined, the following characteristics were associated with increased risk of infant mortality in both unadjusted and adjusted models: black or American Indian race, teenage pregnancy, fourth or higher order births, non-marital childbearing, maternal education <12 years, late or no prenatal care, gestational age <39 weeks, hydramnios/oligohydramnios, abruptio placenta, breech/malpresentation, fetal distress, precipitous labour, premature rupture of membrane, and seizures during labour. The increased risk of infant mortality associated with several of these variables was reduced substantially in Models 2 and 3 because of the combined effects of attendant and the other covariates. Gestational age of 42–43 weeks was associated with an increased risk of infant mortality in Model 1, but became statistically insignificant after other covariates were controlled in Model 3.

The unadjusted risk of infant mortality for Hispanic origin mothers was not initially different from that for white mothers. However, after covariates were adjusted in Models 2 and 3, the risk of infant mortality was about one third lower for Hispanic origin mothers. This is consistent with the empirical literature that reports favourable birth outcomes for Hispanic-Americans despite an increased prevalence of sociodemographic risk factors.^{16, 17} Characteristics associated with a reduced risk of infant mortality in both unadjusted and adjusted models included primiparity, and maternal educational attainment of 13 years or more.

Table 3 Unadjusted and adjusted risks of adverse birth outcomes between physician and certified nurse midwife (CNM) delivered singleton, vaginal births 35-43 weeks gestation: United States, 1991

	Model 1†		Model 2‡		Model 3§	
	OR	95% CI	OR	95% CI	OR	95% CI
Infant mortality (logistic regression)						
Physician	1.00		1.00		1.00	
CNM	0.87	(0.73, 1.03)	0.80*	(0.67, 0.95)	0.81*	(0.68, 0.96)
Neonatal mortality (logistic regression)						
Physician	1.00		1.00		1.00	
CNM	0.68*	(0.49, 0.95)	0.66*	(0.47, 0.93)	0.67*	(0.48, 0.94)
Postneonatal mortality (logistic regression)						
Physician	1.00		1.00		1.00	
CNM	0.95	(0.78, 1.16)	0.86	(0.71, 1.05)	0.86	(0.71, 1.05)
Low birthweight (logistic regression)						
Physician	1.00		1.00		1.00	
CNM	0.71**	(0.67, 0.76)	0.69**	(0.65, 0.74)	0.69**	(0.65, 0.73)
	B	SE(B)	B	SE(B)	B	SE(B)
Mean birthweight (OLS regression)						
CNM	26.97**	1.39	36.14**	1.30	36.57**	1.30
(Physician=reference)						

OR=odds ratio; CI=confidence intervals; B=unstandardised regression coefficient; * $p<0.05$; ** $p<0.01$. †Unadjusted for the effects of attendant at delivery, maternal age, race/ethnicity, marital status, education, parity, prenatal care, and gestation. ‡Adjusted for the effects of attendant at delivery, maternal age, race/ethnicity, marital status, education, parity, prenatal care, and gestation. §Adjusted for the effects of attendant at delivery, maternal age, race/ethnicity, marital status, education, parity, prenatal care, gestation, and medical risk factors/complications.

DIFFERENTIALS IN NEONATAL AND POSTNEONATAL MORTALITY, LOW BIRTHWEIGHT, AND MEAN BIRTHWEIGHT

The first and second panels in table 3 examine neonatal and postneonatal mortality risks for physician and certified nurse midwife delivered births. As expected, the effect of attendant at delivery on birth outcome is more pronounced during the neonatal than the postneonatal period. In Model 1, the risk of neonatal mortality was 32% lower for births delivered by certified nurse midwife than for physician delivered births. This differential increased slightly to 33-34% when the various risk factors were controlled in Models 2 and 3. For postneonatal mortality, the unadjusted risk of 0.95 decreased to 0.86 in the adjusted models (see table 3), although the difference was not statistically significant in either model. The unadjusted risk of delivering a low birthweight infant was 29% lower for certified nurse midwife than for physician delivered births. This differential increased slightly to 31% in Models 2 and 3.

Table 3 also includes the results of ordinary least squares regressions examining the effects of birth attendant and other covariates on mean birthweight. In Model 1, the mean birthweight was 27 grams higher for certified nurse midwife delivered than for physician delivered births. This differential in mean birthweight increased to 36 grams in Model 2, and to 37 grams in Model 3.

Discussion

Many studies have reported excellent birth outcomes for births delivered by midwives compared with physician delivered births. Many of these studies have shown the results for particular hospitals or birthing centres^{10-12 14 16 36} while others have covered a wider geographical region.^{2 13 18-21 28} However, this is the first study known to us that examines mortality risks for all certified nurse midwife delivered births in the United States. For singleton, vaginal births at 35-43 weeks of gestation, the adjusted risk of

infant mortality was 19% lower for certified nurse midwife than for physician attended births, the risk of neonatal mortality was 33% lower, and the risk of delivering a low birthweight infant was 31% lower. Mean birthweight was 37 grams higher for certified nurse midwife than for physician attended births. Differences in postneonatal mortality were not statistically significant.

STRENGTHS AND LIMITATIONS OF THE STUDY

Strengths of this study include the comprehensive population based nature of the data set, which includes all births in the United States in 1991, and the large number of sociodemographic and medical risk factors examined. Limitations include the cross sectional nature of the data set, which provides information on the attendant who actually delivered the baby, but not a complete history of prenatal care and labour and delivery care providers. For the certified nurse midwife births it is probable that a midwife also provided much or all of the prenatal care, as transfers from physician to midwife care are rare. However, patients might be transferred from midwife to physician care during prenatal care or during labour if the midwife felt that the woman's medical condition necessitated a physician's care. The single datum available on birth attendant also fails to take into account the possibility of copractice or joint case management of births between physicians and certified nurse midwives. Although the vast majority of physicians who deliver babies are engaged in physician only practices,³⁰ a substantial minority of midwives are engaged in copractice with physicians.²⁹ In these cases it may be the involvement of the midwife, with her excellent patient education and emotional support,^{2 12 13 16} which is important to better outcomes, rather than whether that involvement is exclusive of all other care providers. Still, the inability to account for the entire history of care providers has the potential to create bias in the comparison of

birth outcomes between physician and certified nurse midwife groups.

Where possible, steps were taken to reduce the potential bias because of this lack of data. Besides statistical controls for many variables associated with patient transfer, the main step was to restrict the multivariate analysis to singleton, vaginal deliveries at 35–43 weeks of gestation, because rates of patient transfer are higher for multiple pregnancies and women delivering substantially before or after term.^{16 20–25} The exclusion of caesarean births from the sample also helps to reduce potential bias, because a high proportion of patients transferred from midwifery to physician care undergo caesarean section.²⁵ Although steps were taken where possible to minimise potential bias, some degree of bias may still be present, and may in part account for the differences in birth outcomes found in this study. It is reassuring to note, however, that many of the hospital or clinic-based studies in the literature were able to attribute outcomes for transferred patients to the attendant who provided the prenatal care, and still reported birth outcomes for certified nurse midwives that were as good as or better than those for physicians.^{11 14 28 38 40 42}

PRACTICE DIFFERENCES

Data limitations notwithstanding, there are also real differences in the approach to patient care between certified nurse midwives and physicians that might also help to explain the differences in birth outcomes found in this study. These can be divided into two areas: those relating to the provision of prenatal care services, and those relating to labour and delivery practices, although differences in prenatal care practices cannot account for the differences in birth outcomes for the 1.7% of physician attended and 2.0% of midwife attended births with no prenatal care.

As regards prenatal care, certified nurse midwives generally spend more time with patients during prenatal visits, and put more emphasis on patient counselling and education, establishing trust, and providing emotional support and empowerment to the pregnant woman.^{2 12 13 16 43–45} Although time use data on prenatal care are sparse, a recent small scale study found that certified nurse midwives spent an average of 49.3 minutes for an initial visit, and 29.3 minutes for return visits, compared with 29.8 and 14.6 minutes, respectively, for physicians.⁴⁵ A substantial portion of the increased time spent by nurse midwives in prenatal visits relates to patient counselling and education, as demonstrated in a study by Sculphome *et al* in which certified nurse midwives spent an average of eight minutes per visit on patient counselling and education, nine minutes on history and physical, six minutes on record review and charting, and 0.5 minutes on consultation.⁴⁴

Recent studies have increasingly questioned the effectiveness of a purely biomedical model of prenatal care as a series of laboratory tests and interventions given at specified weeks of gestation.^{5 46} More important components of prenatal care seem to be lifestyle and behav-

oural advice, education about the birthing process, and emotional support.^{8 44 46–48} A recent study on the relation of the content of prenatal care to the risk of low birthweight found that women who did not receive adequate prenatal advice and counselling were at an increased risk of delivering a low birthweight infant, but that no increased risk was associated with women who did not receive all of the recommended prenatal care procedures.⁴⁷ In the results of an exhaustive literature review, the Office of Technology Assessment of the US Congress concluded that “Certified nurse midwives are more adept than physicians at providing services that depend on communication with patients and preventive actions.”⁴³ Another recent study on the content of prenatal care demonstrated that while all types of providers adhered closely to American College of Obstetricians and Gynecologists (ACOG) guidelines for the content of prenatal care visits, certified nurse midwives adhered most closely to the guidelines.⁴⁹

Certified nurse midwives more often than physicians foster a more personalised approach to labour and delivery including encouraging women to ambulate during labour, encouraging alternative positions for delivery, allowing for intermittent rather than continuous fetal monitoring (necessary to allow for ambulation during labour), allowing food and drink during labour, and allowing women to deliver in a more relaxed non-clinical environment with the presence of family and friends.^{2 10 19} An integral part of nurse midwifery care is providing emotional support and empowerment to women in labour and a personalised approach to the labour and delivery process that allows the woman to choose the type of experience she will have.^{12 13} During labour and delivery, most certified nurse midwives are with their patients on a one on one basis during the entire labour and delivery process, in contrast with physician’s care, which is more often episodic.^{2 13} Studies have reported improved birth outcomes for women who received continuous emotional support during labour, including lower caesarean section rates, shorter durations of labour, and lower rates of anaesthesia and oxytocin use.^{48 50–52} Although biochemical mechanisms are not entirely clear, studies have reported an association between maternal anxiety and decreased uterine contractility and decreased uterine and placental blood flow.⁴⁷ Individualised care, better patient rapport and emotional support, and more time spent in prenatal counselling may help to explain in part the better outcomes for certified nurse midwife than physician births found in this study.

In conclusion, although significant gaps in data availability at the national level do exist national data do support the findings of other local studies that certified nurse midwives have excellent birth outcomes, and provide a safe and viable alternative to maternity care in the United States, particularly for low and moderate risk women.

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SJ/TECH/144/98