



CALIFORNIA
HEALTH BENEFITS REVIEW PROGRAM

Analysis of Assembly Bill 259:
Certified Nurse Midwives:
Direct Access

A Report to the 2009-2010 California Legislature
April 17, 2009

CHBRP 09-08



The California Health Benefits Review Program (CHBRP) responds to requests from the State Legislature to provide independent analyses of the medical, financial, and public health impacts of proposed health insurance benefit mandates and proposed repeals of health insurance benefit mandates. In 2002, CHBRP was established to implement the provisions of Assembly Bill 1996 (California Health and Safety Code, Section 127660, et seq.) and was reauthorized by Senate Bill 1704 in 2006 (Chapter 684, Statutes of 2006). The statute defines a health insurance benefit mandate as a requirement that a health insurer or managed care health plan (1) permit covered individuals to obtain health care treatment or services from a particular type of health care provider; (2) offer or provide coverage for the screening, diagnosis, or treatment of a particular disease or condition; or (3) offer or provide coverage of a particular type of health care treatment or service, or of medical equipment, medical supplies, or drugs used in connection with a health care treatment or service.

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A Report to the 2009-2010 California State Legislature

Analysis of Assembly Bill 259 Certified Nurse Midwives: Direct Access

April 17, 2009

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PREFACE

This report provides an analysis of the medical, financial, and public health impacts of Assembly Bill 259 a bill that would require every health care service plan regulated by the Department of Managed Health Care (DMHC) and every health insurance policy regulated by the California Department of Insurance (CDI) to allow a member the option to seek obstetrical and gynecological services directly from a certified nurse-midwife (CNM) provided that the services fall within the scope of practice of the CNM. In response to a request from the California Assembly Committee on Health on February 13, 2009, the California Health Benefits Review Program (CHBRP) undertook this analysis pursuant to the provisions of Senate Bill 1704 (Chapter 684, Statutes of 2006) as chaptered in Section 127600, et seq. of the California Health and Safety Code.

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CHBRP gratefully acknowledges all of these contributions but assumes full responsibility for all of the report and its contents. Please direct any questions concerning this report to:

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EXECUTIVE SUMMARY

California Health Benefits Review Program Analysis of Assembly Bill 259 Certified Nurse Midwives: Direct Access

The California Health Benefits Review Program (CHBRP) undertook this analysis pursuant to the provisions of Senate Bill 1704 (Chapter 684, Statutes of 2006) as chaptered in Section 127600, et seq. of the California Health and Safety Code in response to a request from the California Assembly Committee on Health on February 13, 2009. This report provides an analysis of the medical, financial, and public health impacts of Assembly Bill (AB) 259.

AB 259 would require every health care service plan regulated by the Department of Managed Health Care (DMHC) and every health insurance policy regulated by the California Department of Insurance (CDI) to allow a member the option to seek obstetrical and gynecological (OB/GYN) services directly from a certified nurse-midwife (CNM) provided that the services fall within the scope of practice of the CNM.

AB 259 is intended to clarify that female enrollees should be permitted to access OB/GYN services from a CNM, in the same way existing law allows female enrollees to access OB/GYN services directly from an obstetrician-gynecologist without a referral from another physician or authorization by the carrier. Specifically, current law requires health plans and insurers to “allow an enrollee the option to seek obstetrical and gynecological physician services directly from a participating obstetrician and gynecologist or directly from a participating family practice physician and surgeon designated by the plan as providing obstetrical and gynecological services¹”. This law, which went into effect in 1995, was intended to clarify that OB/GYN services are primary care services and that members should be able to access the physicians who provide these services directly. AB 259 goes further, and clarifies that members should also have access to CNMs, who are also authorized to provide certain OB/GYN services.

Since licensing, certification, and scope of practice requirements are established at a state level, there is variation in the scope of practice and educational requirements among CNMs from state to state; however, in general in the United States, CNMs are registered nurses with further obstetrics education and training and have passed the certification examination administered by the American College of Nurse Midwifery (ACNM). In other countries, such as Australia, Canada, New Zealand, and the United Kingdom, licensed midwives are educated at the bachelor’s level and do not need to be previously educated in another profession, such as nursing.

In California, CNMs are registered nurses licensed by the California Board of Registered Nursing. They obtain additional obstetrics training from an accredited nurse-midwifery program and pass the ACNM certification examination. CNMs provide obstetrical services such as oversight of normal pregnancy and childbirth. CNMs commonly work in hospitals

¹ Health and Safety Code Sections 1367.69 and 1367.695; Insurance Code Sections 10123.83 and 10123.84.

and birthing centers licensed by the state, and require physician supervision. There are 1,910 CNMs with active licenses in California.

In California, the profession of midwifery has another designation, that of “licensed midwife.” A licensed midwife is an individual who has been issued a license to practice midwifery by the Medical Board of California. These midwives are not necessarily registered nurses, and there are 179 licensed midwives with active licenses in California. Services offered by these types of midwives are not affected by AB 259 since AB 259 only applies to CNMs.

The *Utilization, Coverage, and Cost Impacts* and the *Public Health Impacts* sections of this report will focus the analysis on the use of CNMs in California. However, given the availability of the existing literature, the *Medical Effectiveness* section captures and evaluates literature that may include CNMs practicing in the United States as well as licensed midwives practicing in other countries.

Medical Effectiveness

- The vast majority of randomized controlled trials (RCTs) of the comparative effectiveness of licensed midwives and physicians on birth outcomes and processes of maternity care have been conducted in developed countries other than the United States.
- Although these studies have strong designs for assessing whether differences in outcomes are due to differences in the professionals providing care, their findings may not be generalizable to CNMs and physicians in California for several reasons:
 - The training received by CNMs in the United States is not identical to the training received by licensed midwives in other developed nations.
 - Most studies conducted in other developed countries compare licensed midwives to general practice physicians, whereas in the United States, most pregnant women receive care from obstetrician/gynecologists.
 - The other developed countries in which these RCTs have been performed have universal coverage through national or provincial health insurance plans.
- To ensure that the findings of this analysis would be more generalizable to persons enrolled in health plans in California to which AB 259 would apply, the medical effectiveness review incorporated nonrandomized studies conducted in the United States that controlled for potential confounders, as well as RCTs conducted in both the United States and other developed countries.
- All of the studies identified by the medical effectiveness team compared the effects of CNMs or licensed midwives to the effects of physicians on birth outcomes and/or processes of maternity care.
- No studies of the effectiveness of CNMs as providers of family planning or other gynecological services were identified.

- Most studies only assessed effects on women at low risk for poor birth outcomes.
- Findings regarding the effectiveness of CNMs as providers of maternity care are as follows:
 - Fetal and Infant Health Outcomes
 - A meta-analysis of RCTs conducted in other developed countries found that women who received maternity services from licensed midwives were less likely than those receiving services from physicians to experience fetal loss/neonatal death before 24 weeks of pregnancy, but found no difference in fetal loss/neonatal death after 24 weeks of pregnancy and over the entire duration of pregnancy.
 - One well-designed nonrandomized study conducted in the United States found that CNMs' patients had a lower risk of infant mortality than physicians' patients.
 - The preponderance of evidence from one RCT and two nonrandomized studies conducted in both the United States and a meta-analysis of RCTs conducted in other developed countries indicates that there are no differences in Apgar scores (a measure of newborn health administered immediately after delivery) and in the risks of low birthweight, preterm birth, and admission to a neonatal intensive care unit between infants whose mothers received maternity services from CNMs or licensed midwives, and those cared for by physicians.
 - Maternal Health Outcomes
 - A meta-analysis of RCTs conducted in other developed countries found no differences in rates of prenatal hemorrhage, postpartum hemorrhage, and postpartum depression between mothers who received maternity services from licensed midwives and those cared for by physicians.
 - A nonrandomized study conducted in the United States found that mothers who received maternity services from CNMs were less likely to have a major perineal laceration than mothers cared for by physicians but that rates of postpartum hemorrhage did not differ between the two groups.
 - Process of Maternity Care
 - The preponderance of evidence from nonrandomized studies conducted in the United States suggests that mothers cared for by CNMs are more likely to have a spontaneous vaginal birth and less likely to receive epidurals, intrapartum analgesia or anesthesia, and episiotomies and to have forceps or vacuum extraction used during delivery than mothers cared for by physicians. These findings are confirmed by findings from a meta-analysis of studies conducted in other developed countries that compared care provided by licensed midwives and physicians.
 - A meta-analysis of RCTs conducted in other developed countries reported that mothers who received care from licensed midwives are less likely to be hospitalized during the prenatal period than mothers cared for by physicians. Mothers and infants cared for by licensed midwives also had shorter lengths of

- stay for both postpartum and neonatal hospitalizations and were more likely to initiate breastfeeding.
- Nonrandomized studies conducted in the United States suggest that mothers cared for by CNMs are less likely to have a cesarean birth or to have labor induced than mothers cared for by physicians, but these findings were not corroborated by the meta-analysis of RCTs conducted in other developed countries.
 - A meta-analysis of RCTs conducted in other developed countries found no differences in the number of prenatal visits received by mothers who received care from licensed midwives and those cared for by physicians. The meta-analysis also found no difference in the likelihoods of having an amniotomy, perineal lacerations needing suturing, and oxytocin or opiate analgesia during labor. The length of time in labor also did not differ.
 - No studies were found that assessed whether requiring pregnant women to obtain a referral from a physician to obtain care from a CNM improves the triaging of pregnant women to CNM versus physician care based on their level of risk for poor birth outcomes.

Utilization, Cost, and Coverage Impacts

Coverage

- Based on CHBRP’s survey of health plans, approximately 98.0% of insured Californians have coverage for services provided by a CNM. Of those with coverage, an estimated 67.0% have coverage for direct access to a CNM (i.e., no preauthorization requirements.).
 - Those who do not have direct access to CNM services in the privately insured market are those who are enrolled in DMHC-regulated plans. Those that are enrolled in CDI-regulated privately insured policies currently have direct access to CNM services since those policies typically allow members to seek OB/GYN services directly and since they have an out-of-network option.
 - AB 259 would also apply to California Public Employees’ Retirement System (CalPERS) health maintenance organizations (HMOs), Medi-Cal Managed Care, and Access to Mothers and Infants (AIM) plans. CHBRP estimates that while all publicly insured members have coverage for CNM services, about 50% of CalPERS HMO members and about 50% of Medi-Cal Managed Care and AIM plan members have coverage for direct access to CNM services.

Utilization

- AB 259 would not be expected to impact the rates of overall deliveries in California for women enrolled in plans subject to AB 259 (Table 1).
- Utilization impacts in this analysis are discussed in terms of changes in the use of CNMs for OB/GYN services. According to recently published data and Milliman’s claims data,

CNMs preside over approximately 34,000 births, or 8% of live deliveries in California for women who are enrolled in plans subject to AB 259. The extent to which AB 259 would impact the use of CNMs would depend on whether prior authorization and referral requirements are currently a barrier to ultimately obtaining CNMs services for those members who demand those services. There is inadequate evidence to determine the number of members who may be demanding OB/GYN services from CNMs but are ultimately not able to obtain them due to preauthorization or referral requirements.

Cost

- CHBRP estimates that the average cost per delivery in California in 2009 is \$11,625. This average cost represents a weighted-average cost of \$9,667 per normal delivery (about 70% of total deliveries) and \$16,127 per cesarean delivery (about 30% of total deliveries) (Table 1).
- If AB 259 would result in more women choosing to seek OB/GYN services from CNMs, the potential shift toward greater use of CNMs would have no measurable change in total premiums, per delivery cost, or total expenditures, because CNMs are generally paid the same rates for their services as physicians. It is possible that requiring a referral before gaining access to CNM services may delay the receipt of early prenatal care among some women, but again, such delays are unlikely to have direct near-term cost impacts because the vast majority of prenatal care expenses are paid for through global fees to the attending provider.
- CHBRP finds no available evidence that the average cost of normal deliveries differs between OB/GYNs and CNMs. There is some evidence that women attended by CNMs are less likely to use some maternity services. However, these nonrandomized studies do not adequately account for possible selection effects. (An example of a selection effect that may not be adequately controlled is the likelihood that women who select care from CNMs tend to not want cesarean deliveries.) The reductions in cesarean deliveries, induced labors, and epidural use from observational studies are not a scientifically reliable basis for estimating the potential cost savings associated with CNM-attended deliveries. Therefore, even if some portion of insured women switch from OB/GYNs to CNMs for their obstetrical and gynecological care, there is no scientifically valid evidence that measurable cost savings would be achieved.
- Based on responses from CHBRP's carrier survey and input from regulatory agencies, AB 259 may result in the administrative impact of health plans and insurers expanding their provider networks to ensure that members have adequate access to CNM services.
- CHBRP estimates no measurable impact of AB 259 on the number of uninsured since there would be no measurable impact on premiums.

Public Health Impacts

- The public health impact of AB 259 hinges on (1) a change in the number and percentage of women in the covered population choosing CNM instead of physician care in response to the bill, and (2) demonstration of improved health and economic outcomes attributable to CNM care. Although the medical literature is consistent in showing that CNM care is equivalent to or surpasses physician care for various health outcomes for mothers and infants, the well-designed studies showing this effect are from outside the United States. Underlying differences in populations and care models may make their results inapplicable to the United States. In addition, we are aware of no data that address the degree to which AB 259's removal of a physician referral requirement for CNM care will promote migration to CNM care. Accordingly, CHBRP is unable to estimate a public health impact for this bill.
- Based on input from content experts, it is possible that some women may obtain earlier prenatal care due to the removal of the referral requirement.
- In addition, there may be long-term impacts, unquantifiable at present, if removal of the referral requirement leads to gradual and long-term increases in CNM-attended births. CHBRP presents an alternative long-term impact scenario assuming an increase in the proportion of births in California attended by CNMs—with clear caveats—regarding the applicability and validity of the underlying literature base. This scenario projects an increase in spontaneous vaginal deliveries, which are recognized as the ideal outcome for low-risk pregnancies, corresponding to projected increases in CNM utilization.

Table 1. Summary of Coverage, Utilization, and Cost Impacts of AB 259

	Before Mandate	After Mandate	Increase/ Decrease	Change After Mandate
Coverage				
Total population in plans subject to state regulation (a)	21,340,000	21,340,000	0	0%
Total population in plans subject to AB 259	21,340,000	21,340,000	0	0%
Percentage of individuals with certified nurse-midwife coverage	98%	100%	2.00%	2.04%
Number of individuals with certified nurse-midwife coverage	20,913,000	21,340,000	427,000	2.04%
Percentage of individuals with direct access to certified nurse-midwives	67.0%	100.0%	33.0%	49.25%
Number of individuals with direct access to certified nurse-midwives	14,277,800	21,340,000	7,042,200	49.25%
Utilization and Cost				
Number of deliveries	427,000	427,000	-	0%
Average cost per delivery	\$11,625	\$11,625	-	0%
Expenditures				
Premium expenditures by private employers for group insurance	\$50,546,207,000	\$50,546,207,000	\$0	0.00%
Premium expenditures for individually purchased insurance	\$5,944,229,000	\$5,944,229,000	\$0	0.00%
Premium expenditures by individuals with group insurance, CalPERS, Healthy Families, AIM, or MRMIP (b)	\$13,475,994,000	\$13,475,994,000	\$0	0.00%
CalPERS employer expenditures (c)	\$3,161,160,000	\$3,161,160,000	\$0	0.00%
Medi-Cal state expenditures	\$4,112,865,000	\$4,112,865,000	\$0	0.00%
Healthy Families state expenditures	\$643,247,000	\$643,247,000	\$0	0.00%
Individual out-of-pocket expenditures for covered benefits (deductibles, copayments, etc.)	\$6,384,077,000	\$6,384,077,000	\$0	0.00%
Out-of-pocket expenditures for noncovered benefits	\$0	\$0	\$0	0.00%
Total Annual Expenditures	\$84,267,779,000	\$84,267,779,000	\$0	0.00%

Source: California Health Benefits Review Program, 2009.

Notes: (a) This population includes privately insured (group and individual) and publicly insured (e.g., CalPERS, Medi-Cal, Healthy Families, AIM, MRMIP) individuals enrolled in health insurance products regulated by DMHC or CDI. Population includes enrollees aged 0-64 years and enrollees 65 years or older covered by employment sponsored insurance.

(b) Premium expenditures by individuals include employee contributions to employer-sponsored health insurance and member contributions to public insurance.

(c) Of the CalPERS employer expenditures, about 59% would be state expenditures for CalPERS members who are state employees, however CHBRP estimates no impact of the mandate on CalPERS employer expenditures.

Key: AIM=Access for Infants and Mothers; CalPERS=California Public Employees' Retirement System; CDI=California Department of Insurance; DMHC=Department of Managed Health Care; MRMIP=Major Risk Medical Insurance Program.

INTRODUCTION

Assembly Bill (AB) 259 would require health plans and insurers to allow members the option to obtain obstetrical and gynecological (OB/GYN) services from a certified nurse-midwife (CNM) without prior approval from the carrier or a physician referral. Services rendered by a CNM must be provided within the CNM's scope of practice.

The California Health Benefits Review Program (CHBRP) undertook this analysis pursuant to the provisions of Senate Bill 1704 (Chapter 684, Statutes of 2006) as chaptered in Section 127600, et seq. of the California Health and Safety Code in response to a request from the California Assembly Committee on Health on February 13, 2009. This report provides an analysis of the medical, financial, and public health impacts of AB 259.

Background on Certified Nurse-Midwives Profession and Practice

CNMs and Licensed Midwives

Before detailing CNM's profession and practice, the terms "CNMs" and "licensed midwives" need clarification. Since licensing, certification, and scope of practice requirements are established at a state level, there is variation in the scope of practice and educational requirements among CNMs from state to state; however, in general in the United States, CNMs are registered nurses with further obstetrics education and training, and have passed the certification examination administered by the American Midwifery Certification Board (AMCB).

In other countries, such as Australia, Canada, New Zealand, and the United Kingdom, "licensed midwives" are educated at the bachelor's level and do not need to be previously educated in another profession, such as nursing.

In California, the profession of midwifery has two designations: "licensed midwife" and "certified nurse-midwife." A licensed midwife is an individual who has been issued a license to practice midwifery by the Medical Board of California. Under the supervision of a licensed physician, licensed midwives may attend cases of normal childbirth in a home, birthing clinic, or hospital. These individuals must have completed a 3-year postsecondary education program at an accredited midwifery school approved by the Medical Board of California. These midwives are not necessarily registered nurses.² There are 179 licensed midwives with active licenses in California.

In contrast, CNMs are licensed by the California Board of Registered Nursing (BRN). CNMs are registered nurses who obtain additional training in obstetrics from a nurse-midwifery program. The program must be accredited by the American College of Nurse Midwives

² Medical Board of California. Available at: www.medbd.ca.gov/allied/midwives.html. Accessed March 19, 2009.

(ACNM) and CNM candidates must pass the AMCB certification examinations. The sections below in the *Introduction*, provides further details regarding a CNM's scope of practice, educational and licensing requirements, and supply of CNMs in California.

AB 259 applies only to CNMs. Therefore, this report will focus on the use of CNMs in California. However, given the availability of the existing literature, the *Medical Effectiveness* section captures and evaluates literature that may include CNMs practicing in the United States and licensed midwives practicing in other countries.

CNM Scope of Practice

Although CNMs' scope of practice depends on the statutes and regulations of the state in which they practice, most states allow them to provide obstetrical and gynecological care to women from puberty through their lifespan. The California Business and Professions (B&P) Code defines CNMs' scope of practice in this state.³ This regulation states that CNMs may "attend cases of normal childbirth and...provide prenatal, intrapartum, and postpartum care, including family-planning care, for the mother, and immediate care for the newborn." It also states that "practice of nurse-midwifery constitutes the furthering or undertaking by any certified person, under the supervision of a licensed physician and surgeon who has current practice or training in obstetrics, to assist a woman in childbirth so long as progress meets criteria accepted as normal. All complications shall be referred to a physician immediately." "Supervision" does not require that the supervising physician be physically present when the CNM is providing care. The B&P Code also places several specific restrictions on various aspects of CNM care. For example, the code states that "the practice of nurse-midwifery does not include the assisting of childbirth by any artificial, forcible, or mechanical means, nor the performance of any version (turning or repositioning of the fetus within the uterus or birth canal)."⁴ However, CNMs in California hold prescribing authority: they may 'furnish or order' drugs or devices, including controlled substances, in conjunction with the furnishing of family planning services, 'routine health care or perinatal care,' or care consistent with their education or clinical competency." CNMs in California may also perform specified procedures; CNMs may "perform and repair episiotomies, and...repair first-degree and second-degree lacerations of the perineum" under specified conditions. According to the BRN, in addition to providing this obstetrical and gynecological care, CNMs are also authorized to serve as a primary care providers for women and infants (BRN, 2001).

State-to-state differences in scope of practice focus around (1) the degree of CNMs' prescriptive authority and (2) the independence with which CNMs have authority to function (Ament, 2006). As advanced practice nurses, CNMs have some degree of prescribing authority in all 50 states and the District of Columbia. In some states, CNMs hold unlimited

³ California Business and Professions Code Section 2746 - 2746.8

⁴ The term "version" refers to turning the fetus to place it in the vertex (i.e., head first) position for delivery. The fetus needs to be in the vertex position to move down the birth canal. Mothers whose fetuses are not in vertex position at delivery are at greater risk for cesarean delivery and other complications.

prescribing authority. In others, CNMs may be restricted from prescribing controlled substances such as some narcotic drugs, or this may require delegation from a physician. Some states place specific restrictions on various aspects of CNM care. As described above, in California, CNMs may not assist with childbirth by any “artificial, forcible or mechanical means”. Other states such as Oregon and Hawaii do not place specific, explicit restrictions on CNM scope of practice, instead allowing for “[t]he independent management of women’s health care, focusing particularly on pregnancy, childbirth, the post-partum period, care of the newborn, and the family planning and gynecological needs of women” (Ament, 2006).

Educational and Licensing Requirements of CNMs

As mentioned, in California, CNMs are required to be a licensed registered nurse (RN) and be certified in nurse-midwifery by the BRN. The BRN’s educational standards adhere to the California Code of Regulations, which requires that a nurse-midwifery program include 12 months of training to “provide a knowledge and skills base necessary for nurse-midwifery management of women and neonates.” The curriculum is to include:

- Anatomy; physiology; genetics; obstetrics and gynecology; embryology and fetal development; neonatology; child growth and development; pharmacology; nutrition; laboratory and diagnostic tests and procedures; and physical assessment.
- Concepts in psychosocial, emotional, and cultural aspects of maternal/child care; human sexuality; counseling and teaching; maternal/infant/family bonding process; breast feeding; family planning; principles of preventive health; and community health.
- All aspects of the management of normal pregnancy, labor and delivery, postpartum period, newborn care, family planning and/or routine gynecological care in alternative birth centers, homes, and hospitals.”⁵

According to the BRN, there are three methods by which an RN may become a CNM (BRN, 2001):

- Successful completion of a board-approved nurse-midwifery academic program that meets the BRN’s educational standards.
- Completion of a nurse-midwifery academic program that meets the BRN’s educational standards, but is not board-approved.
- Certification by a national organization or organization in another state whose standards are the same as the BRN’s educational standards, or the American College of Nurse-Midwives, or pass the CNM certification exam administered by the American Midwifery Certification Board.

Currently, there are four programs approved by the BRN in California⁶:

⁵ Title 16, CCR, Division 14., Article 6. Nurse-Midwives, Section 1462.

- California State University Fullerton, Department of Nursing Graduate Program, Women’s Health Care–Nurse Midwifery
- San Diego State University, School of Nursing, Graduate Nurse-Midwifery/WHCNP Program
- University of California, San Francisco, Master of Science in Nursing, Nurse Midwifery Specialty
- University of California, San Francisco, Interdepartmental Nurse Midwifery Education Program

Supply of CNMs in California

The California Board of Registered Nursing reports a total of 1,910 CNMs (1,183 CNMs and 727 “furnishing” CNMs, who are additionally authorized to prescribe controlled substances) with active licenses (BRN, 2009). CNMs provide family planning and well-woman care, but pregnancy and delivery care predominate (BRN, 2001).

In 2005, CNMs attended more than 11% of vaginal births and nearly 8% of all births in California (Declercq, 2009). Between 1990 and 2004, the number of births attended by CNMs as a proportion of all vaginal births increased by more than 4%. In the 2000-2004 period, however, California was one of the states that experienced the largest decreases in CNM-attended births (Declercq, 2007). Approximately 99% of births nationally occur in a hospital, with the remaining 1% distributed between home births, birth centers, and doctors’ offices or clinics. Most births attended by CNMs occur in hospitals (approximately 88%) (Martin et al., 2009).⁷

CNM-attended birth trends in California reflect national developments. In the United States overall, the use of CNMs (and licensed midwives) as birth attendants has increased steadily since the mid 1970s; however, this growth has begun to level in recent years. Between 1975 and 2002, midwife-attended births steadily increased from less than 1% to about 8%, a figure that has not changed since 2004 (Martin et al., 2009).

Populations Served by CNMs

Study results indicate that CNMs tend to serve minority populations and populations at risk for poor pregnancy outcomes, including women who are uninsured, immigrants, and adolescents, and women of color (Declercq et al., 2001). A national survey on nurse-midwifery care revealed that 99% of clinically active CNMs care for women from these

⁶ State of California Department of Consumer Affairs. Nurse-Midwifery Programs. Available at: www.rn.ca.gov/pdfs/schools/nmwschools.pdf. Accessed March 12, 2009.

⁷ According to Martin et al., 2009, most midwife attended births are by CNMs (94.3% and most midwife-attended births occur in hospitals (93.0%).

vulnerable populations. In addition, seven out of 10 annual visits to CNMs are made by women or infants from vulnerable populations (Rorie et al., 1996). In California, CNMs disproportionately serve women in rural areas. A 1998 study examining the types of providers who care for underserved patients revealed that 16% of CNMs worked in rural areas, and 35% worked in areas where a primary care health provider shortage was identified (Grumbach, 2003).

Background on AB 259

Provisions of AB 259

Beginning January 1, 2010, AB 259 would require that every health plan regulated by the Department of Managed Health Care (DMHC) and every health insurance policy regulated by the California Department of Insurance (CDI) allow a member the option to seek obstetrical and gynecological services directly from a CNM, provided that the services fall within the scope of practice of the CNM. The bill would prohibit plans from requiring an enrollee “to obtain prior approval from another physician, another provider, or the plan/insurer prior to obtaining direct access to obstetrical and gynecological services.”

The bill would also allow a plan or insurer to “establish reasonable provisions governing utilization protocols and the use of...certified nurse-midwives...participating in the plan network, medical group, or independent practice association, provided that these provisions shall be consistent with the intent of this section and shall be those customarily applied to other physicians and surgeons, such as primary care physicians and surgeons, to whom the enrollee has direct access, and shall not be more restrictive for the provision of obstetrical and gynecological services.”

Finally, the bill allows the plan/insurer to “establish reasonable requirements for the...certified nurse-midwife...to communicate with the enrollee’s primary care physician and surgeon regarding the enrollee’s condition, treatment, and any need for follow-up care.”

AB 259 does not alter a current law related to a CNMs’ licensing, educational requirements, or scope of practice. Therefore, the current laws and regulations would continue to apply and CNMs would only be permitted to furnish services that fall within their scope of practice.

AB 259 does not explicitly require plans or insurers to alter their provider networks or contractual arrangements. However, AB 259 may indirectly require plans or insurers to alter their provider networks to allow members direct access to CNMs. Although AB 259 states that health plans regulated by the DMHC are to provide access to “participating” CNMs, if plans do not have an adequate network to meet members’ demands for CNM services, plans may have to build out their networks. Plans may also be required to alter their provider directories to reflect the names and contact information of CNMs that participate in the plans’ network. On the other hand, if plans are permitted to restrict access to care to only participating CNMs and demonstrate adequacy of their network in terms of obstetrics-gynecological services (based on the full range of providers who are eligible to provide those

services, including obstetricians and gynecologist and family physicians) then plans may currently be in compliance.^{8,9}

Federal law requires the Medicaid-contracting plans (or Medi-Cal Managed Care Plans in California) to allow enrollees to access CNMs. In addition, state rules require Medi-Cal Managed Care plans to allow enrollees to use CNMs as providers of primary care (DHS, 1998). Since Medi-Cal Managed Care Plans are subject to mandate laws, these plans would be affected by AB 259 to the extent they need to make alterations to allow *direct* access to CNMs.

Intent of AB 259

AB 259 is intended to clarify that female enrollees should be permitted to access OB/GYN services from a CNM, in the same way existing law allows female enrollees to access OB/GYN services directly from an obstetrician-gynecologist without a referral from another physician or authorization by the carrier.¹⁰ Specifically, current law requires health plans and insurers to “allow an enrollee the option to seek obstetrical and gynecological physician services directly from a participating obstetrician and gynecologist or directly from a participating family practice physician and surgeon designated by the plan as providing obstetrical and gynecological services¹¹. This law, which went into affect in 1995, was intended to clarify that OB/GYN services are primary care services and that members should be able to access the physicians who provide these services directly. AB 259 goes further, and clarifies that members should also have access to CNMs, who are also authorized to provide certain OB/GYN services.

According to the bill author and sponsor, the bill is intended to “reduce barriers to care, decrease the financial burden for patients who may be paying multiple copayments, and reduce administrative costs and administrative time demands for physicians.” The bill author and sponsor believe that AB 259 would remove the administrative hassle and the corresponding copayment of the member having to go to a physician to obtain a referral to see their CNM provider for OB/GYN services.

⁸ Personal communication, Sherrie Lowenstein, Department of Managed Health Care, March 2009.

⁹ Because CDI-regulated products, such as preferred provider organizations, have out-of-network options, those insurers would be in compliance by allowing members to obtain care out of network. AB 259 would not prohibit those health insurance policies from charging members a differential cost sharing for seeking care out of network.

¹⁰ Personal communication with representatives from the California Nurse-Midwives Association and the personal staff of Assembly Member Nancy Skinner, February 2009.

¹¹ Health and Safety Code Sections 1367.69 and 1367.695; Insurance Code Sections 10123.83 and 10123.84.

Legislative activity in other states

As of December 2008, 31 states have enacted mandates related to CNM services, including California (BCBSA, 2008). A preliminary review of 15 of these laws reveals that most states mandate coverage or direct reimbursement of midwife services rather than mandating direct access to CNM services. For example, Alaska, Maine, Maryland, Massachusetts, Nebraska, New Hampshire, New Mexico, New York, North Carolina, Rhode Island, and West Virginia have laws that require insurers to provide coverage for CNM services. Other states, such as California, Delaware, and Tennessee, mandate that insurers directly reimburse CNMs if CNMs render services. However, they do not mandate that insurers cover these services. Of the 15 laws reviewed, Colorado is the only state that requires direct access to CNM services. The state mandates that managed care plans that cover reproductive health or gynecological care “provide direct access to an obstetrician, gynecologist, or an advanced practice nurse who is a certified nurse midwife.”¹²

¹² Colorado Revised Statutes. Title 10, Article 16, Section 107 (2008).

MEDICAL EFFECTIVENESS

As indicated in the *Introduction*, Assembly Bill (AB) 259 would require health plans and insurers to allow a member the option to obtain obstetrical and gynecological services from a certified nurse-midwife (CNM) without prior approval from the carrier or a referral from a physician. Services rendered by a CNM must be provided within the CNM's scope of practice, which encompasses obstetrical and gynecological care for the women and ensuring the health of the infant immediately postpartum. This section of the report summarizes findings from studies that compare the effectiveness of CNMs and physicians as providers of these services. To assess the medical effectiveness of a requirement that health plans and insurers permit women to self-refer to CNMs, it is important to assess whether and how health outcomes and processes of care differ for women and infants cared for by CNMs and physicians.

A literature search was conducted to retrieve studies of the comparative effectiveness of CNMs and physicians in providing health care services to women and infants. The following databases of peer-reviewed literature were searched: MEDLINE (PubMed), the Cochrane Database of Systematic Reviews, the Cochrane Register of Controlled Clinical Trials, the Cumulative Index of Nursing and Allied Health Literature, Web of Science, and EconLit. In addition, Web sites maintained by the following organizations that index or publish systematic reviews and evidence-based guidelines were searched: Agency for Healthcare Research and Quality, Institute for Clinical Systems Improvement, International Network of Agencies for Health Technology Assessment, National Health Service Centre for Reviews and Dissemination, National Institutes of Health, National Guidelines Clearinghouse, National Institute of Clinical Evidence, Scottish Intercollegiate Guideline Network, the U.S. Preventive Services Task Force, and the World Health Organization.

Literature Review Methods

The literature search was limited to studies published in English from 1979 to the present. Studies of licensed midwives in the United States who are not CNMs were excluded because AB 259 only applies to CNMs. A total of 173 citations were retrieved. Seven pertinent studies were identified and reviewed. They included one meta-analysis of randomized controlled trials (RCTs) conducted in other developed countries (Hatem et al., 2008) and six individual RCTs and nonrandomized studies conducted in the United States (Cragin and Kennedy, 2006; Davis et al., 1994; Heins et al., 1990; MacDorman and Singh, 1997; Oakley et al., 1996; Rosenblatt et al., 1997). The studies conducted in other developed countries compared midwives who were licensed under their countries licensure laws to physicians. These countries do not license CNMs. A more thorough description of the methods used to conduct the medical effectiveness review and the process used to grade the evidence for each outcome measure is presented in Appendix B: Literature Review Methods. Appendix C includes tables that describe the studies that CHBRP reviewed and their findings.

Outcomes Assessed

All of the studies identified by the Medical Effectiveness team compared the effects of CNMs practicing in the United States or licensed midwives practicing in other developed countries to the effects of physicians on birth outcomes and/or processes of maternity care. No studies of the effectiveness of CNMs as providers of family planning or other gynecological services were identified. The list of outcomes and processes of care reflect the outcomes and processes evaluated in the studies included by the Medical Effectiveness team. CHBRP found a few studies on the comparative effectiveness of CNMs and physician on utilizations of prenatal services (ultrasounds, education on nutrition), but they were not included in this review because they lacked methodological rigor in controlling for differences between CNMs' and physicians' patients that might affect findings. No studies on long-term outcomes such as child development were located. No studies assessed whether requiring women to obtain a referral before receiving services from a CNM was associated with better health outcomes or processes of care.

The outcomes and processes assessed can be divided into three categories:

- Fetal or infant health outcomes
 - Fetal and infant mortality
 - Apgar scores
 - Birth weight
 - Preterm birth
 - Neonatal intensive care unit admissions
 - Fetus in vertex (i.e., head first) position at birth
- Maternal health outcomes
 - Prenatal hemorrhage
 - Postpartum hemorrhage
 - Postpartum depression
 - Major perineal laceration
 - Number of complications
- Processes of maternity care
 - Prenatal visits
 - Prenatal hospitalizations

- Amniotomy
- Oxytocin during labor
- Analgesia/anesthesia during labor
- Epidural anesthesia during labor
- Opiate analgesia during labor
- Length of time in labor
- Induction of labor
- Cesarean birth
- Use of forceps or vacuum extraction during delivery
- Spontaneous labor or vaginal birth
- Episiotomy
- Perineal laceration needing suturing
- Intact perineum
- Length of mother's postpartum hospital stay
- Length of infant's neonatal hospital stay
- Breastfeeding initiation
- Mobility during labor

Study Findings

All but one of the RCTs of the comparative effectiveness of licensed midwives and physicians retrieved were conducted in developed countries other than the United States. Although these studies have strong designs for assessing whether differences in outcomes are due to differences in the professionals providing care, their findings may not be generalizable to CNMs and physicians in California for several reasons. First, the training received by CNMs in the United States is not identical to the training received by licensed midwives in other developed nations. In Australia, Canada, New Zealand, and the United Kingdom, licensed midwives are educated at the bachelor's level and do not need to be previously educated in another profession. In contrast, CNMs are registered nurses who have completed additional education in midwifery, often at the master's level. As noted in the *Introduction*, CNMs are required to be licensed registered nurses (RNs) and be certified in nurse-midwifery by the California Board of Registered Nursing (BRN). In other developed nations, licensed midwives do not necessarily have prior education in nursing. Second, most studies

conducted in other developed countries often compare licensed midwives to general practice physicians, whereas in the United States, most pregnant women receive care from obstetrician/gynecologists. Third, the other developed countries in which these RCTs have been performed have universal coverage through national or provincial health insurance plans. Pregnant women in countries with universal coverage may have different patterns of seeking prenatal care, and national or provincial health insurance plans may have more restrictive clinical practice guidelines than those used by health plans in the United States.

To ensure that the findings of this analysis would be more generalizable to persons enrolled in health plans in California to which AB 259 would apply, the medical effectiveness review incorporated nonrandomized studies conducted in the United States as well as RCTs conducted in both the United States and other developed countries. A major difference between U.S. and non-U.S. study methods is the degree of Patient Initiated Care (PIC). PIC refers to the patients' option and right to choose their provider. In the United States, health plans offer patients a choice of providers, and therefore, experimental allocation of a provider would not be feasible. All U.S. studies allow for PIC, whereas all of the non-U.S. studies randomly assigned patients to a provider. Results of nonrandomized studies that compare CNMs and physicians are more likely to be confounded by selection bias associated with PIC than RCTs because there is a greater risk that the populations cared for by the two groups of providers may differ in ways that would affect the outcome of analyses. For example, women cared for by CNMs may be healthier than women cared for by physicians and, thus, at lower risk for having poor birth outcomes. In addition, women who select CNMs may have different attitudes toward analgesia/anesthesia, cesarean deliveries, and other interventions during childbirth, which could confound attempts to measure differences in the use of interventions between CNMs and physicians. On the other hand, the results of comparisons of CNMs and physicians in the United States are more likely to reflect differences in outcomes and processes of care for mothers and infants treated by these two groups of providers in California and, thus, to be more generalizable to California. In addition, all of the nonrandomized studies included in the review used standard techniques to control for observable differences in the risk of poor birth outcomes between women who received care from CNMs and physicians, such as having a chronic condition prior to pregnancy (e.g., diabetes, hypertension), alcohol or drug addiction, and multiple gestation. Information regarding the specific methods that the authors of the nonrandomized studies used to reduce the risk of selection bias is contained in Table C-2 in Appendix C. Although nonrandomized study designs are not as strong as an RCT, the use of statistical adjustment may reduce the likelihood of some of the more obvious alternative explanations for differences in outcomes between CNMs' and physicians' patients.

Most studies only assessed effects on women at low risk for poor birth outcomes. One RCT conducted in the United States enrolled women at high risk for delivering a low birth weight infant (Heins et al., 1990). One well-designed nonrandomized study conducted in the United States evaluated outcomes for mothers and infants at all levels of risk for poor birth outcomes and controlled for risk by conducting multivariate analyses. The focus on women at low risk for poor birth outcomes is consistent with California law governing the scope of practice for CNMs. As noted in the *Introduction*, the California Business and Professions (B&P) Code Sections 2746-2746.8 states "all complications shall be referred to a physician immediately.

The practice of nurse-midwifery does not include the assisting of childbirth by any artificial, forcible, or mechanical means, nor the performance of any version.”¹³

One of the studies conducted in the United States used national data from birth certificates. The other United States studies assessed outcomes for mothers and infants in individual states. The RCTs conducted in other developed countries that were included in the meta-analysis were carried out in Australia, Canada, New Zealand, and the United Kingdom.

Findings regarding the effectiveness of CNMs as providers of maternity care are as follows.

Fetal and Infant Health Outcomes

Fetal and infant mortality

A nonrandomized study conducted in the United States reported that receiving care from a CNM was associated with a lower infant mortality rate and that the difference in infant mortality rates between CNMs and physicians was statistically significant (MacDorman and Singh, 1997). However, another nonrandomized U.S. study found no statistically significant difference in rates of live births. The meta-analysis of RCTs performed in other countries found that obtaining care from a licensed midwife was associated with a statistically significant reduction in the risk of fetal death prior to 24 weeks of pregnancy but that the risk of fetal death at or after 24 weeks and the overall risk of fetal death during the entire pregnancy did not differ between licensed midwives and physicians (Hatem et al., 2008).

Apgar scores

One nonrandomized study carried out in the United States examined the effect of receiving care from a CNM on Apgar scores, a measure of newborn health administered immediately after delivery. This study reported no statistically significant difference in Apgar scores between newborns delivered by CNMs and physicians (Rosenblatt et al., 1997). This finding was confirmed by the meta-analysis of RCTs conducted in other developed countries. A pooled analysis of findings from the eight RCTs included in the meta-analysis that assessed effects on Apgar scores found no statistically significant differences between newborns delivered by licensed midwives and physicians (Hatem et al., 2008).

Birth weight

An RCT performed in the United States found no statistically significant difference in the likelihoods that mothers at high risk for preterm birth cared for by CNMs and obstetricians during the prenatal period would deliver a low birth weight or very low birth weight infant (Heins et al., 1990). Findings from the meta-analysis of RCTs conducted in other developed countries suggest that this finding extends to low-risk mothers. A pooled analysis of findings from the five RCTs included in the meta-analysis that assessed the risk of delivering a low

¹³ The term “version” refers to turning the fetus to place it in the vertex (i.e., head first) position for delivery. The fetus needs to be in the vertex position to move down the birth canal. Mothers whose fetuses are not in vertex position at delivery are at greater risk for cesarean delivery and other complications.

birth weight infant found no statistically significant differences between newborns delivered by licensed midwives and physicians (Hattem et al., 2008). A nonrandomized study carried out in the United States also reported no statistically significant difference in mean birth weight between newborns delivered by CNMs and physicians (Rosenblatt et al., 1997).

Preterm birth

A meta-analysis of RCTs performed in other developed countries identified five RCTs that had compared rates of preterm birth between mothers cared for licensed midwives and physicians. The pooled analysis of findings from these five RCTs found no statistically significant difference in the rate of preterm birth (Hattem et al. 2008).

Neonatal intensive care unit admissions

A meta-analysis of RCTs carried out in other developed countries reported no difference in the likelihood that newborns delivered by licensed midwives and physicians would be admitted to a neonatal intensive care unit (ICU). A pooled analysis of 10 RCTs included in the meta-analysis that assessed the risk of neonatal ICU admission found no statistically significant difference in admission rates for newborns delivered by licensed midwives and physicians (Hattem et al., 2008).

Other infant health outcomes

One nonrandomized study conducted in the United States reported no statistically significant difference in the percentage of newborns delivered by CNMs and physicians who had vertex (i.e., head first) presentation (Rosenblatt et al., 1997).

The preponderance of evidence from RCTs conducted in other developed countries and nonrandomized studies performed in the United States suggests that receiving care from a CNM is associated with a lower risk of fetal loss before 24 weeks of pregnancy but does not affect the risk of fetal loss after 24 weeks of pregnancy or the overall risk of fetal loss during the entire pregnancy. The preponderance of evidence suggests that Apgar scores and the risks of low birth weight, preterm birth, and admission to neonatal ICU units do not differ for newborns delivered by CNMs and physicians.

Maternal Health Outcomes

Prenatal hemorrhage

A meta-analysis of RCTs performed in other developed countries identified four RCTs that had compared rates of prenatal hemorrhage between mothers cared for licensed midwives and physicians. The pooled analysis of results from these four RCTs found no statistically difference in the risk of prenatal hemorrhage (Hattem et al. 2008).

Postpartum hemorrhage

A nonrandomized study carried out in the United States found no statistically significant differences in rates of postpartum hemorrhage between mothers cared for by CNMs and obstetricians (Oakley et al., 1996). This finding was corroborated by the meta-analysis of

RCTs performed in other developed countries. The meta-analysis identified seven RCTs that compared rates of postpartum hemorrhage between mothers who received prenatal care from licensed midwives and physicians. The pooled analysis of findings from these seven RCTs found no statistically significant difference in the rate of postpartum hemorrhage (Hattem et al., 2008).

Postpartum depression

A meta-analysis of RCTs performed in other developed countries identified one RCT that had compared rates of postpartum depression between mothers treated by licensed midwives and physicians. This RCT found no statistically significant difference in the rate of postpartum depression (Hattem et al., 2008).

Major perineal lacerations

A nonrandomized study carried out in the United States reported that mothers cared for by CNMs were less likely to have major perineal lacerations than mothers cared for by obstetricians (Oakley et al., 1996).

Number of complications

A nonrandomized study carried out in the United States reported that mothers cared for by CNMs had fewer complications than mothers cared for by obstetricians (Oakley et al., 1996).

Findings from RCTs conducted in other developed countries reported no statistically significant differences in rates of prenatal hemorrhage, postpartum hemorrhage, and postpartum depression. One nonrandomized study carried out in the United States found that mothers treated by CNMs were less likely to have major perineal lacerations and had fewer complications.

Maternity Care Processes

Prenatal visits

A meta-analysis of RCTs performed in other developed countries identified one RCT that had compared numbers of prenatal visits received by mothers cared for by licensed midwives and physicians. This RCT found no statistically significant difference in the mean number of prenatal visits (Hattem et al., 2008).

Prenatal hospitalizations

A meta-analysis of RCTs performed in other developed countries identified five RCTs that had compared the risk of prenatal hospitalization between mothers cared for licensed midwives and physicians. The pooled analysis of findings from these five RCTs found that mothers cared for by licensed midwives were less likely to be hospitalized during pregnancy and that the difference was statistically significant (Hattem et al., 2008).

Amniotomy

A meta-analysis of RCTs performed in other developed countries identified three RCTs that had compared the risk of amniotomy¹⁴ between mothers cared for licensed midwives and physicians. The pooled analysis of results from these three RCTs found no statistically significant difference in the risk of amniotomy (Hattem et al., 2008).

Receipt of oxytocin during labor

A meta-analysis of RCTs performed in other developed countries identified 10 RCTs that had compared the risk of receiving oxytocin during labor between mothers cared for by licensed midwives and physicians. The pooled analysis of results from these 10 RCTs found no statistically difference in the risk of receiving oxytocin during labor (Hattem et al., 2008).

Receipt of analgesia/anesthesia during labor

A nonrandomized study conducted in the United States found that mothers cared for by CNMs were less likely to use any anesthesia during labor than mothers cared for by physicians and that the difference was statistically significant (Rosenblatt et al., 1997). This finding was consistent across comparisons between CNMs and family physicians and between CNMs and obstetricians. Another nonrandomized U.S. study reported that mothers cared for by CNMs were less likely to use any pharmacological methods of pain control during labor than mothers cared for by physicians (Cragin and Kennedy, 2006). These findings were corroborated by the meta-analysis of RCTs performed in other developed countries. A pooled analysis of results from the five RCTs that examined this outcome indicated that mothers cared for by licensed midwives were less likely to use any analgesia or anesthesia during labor and that the difference was statistically significant (Hattem et al., 2008). These findings are not surprising because CNMs are more oriented toward use of nonpharmacological methods to cope with labor pains.

Receipt of epidural anesthesia during labor

Epidural anesthesia is used in labor to continuously infuse an anesthetic agent directly into the epidural space in a mother's back to reduce sensation in the lower area of the body while permitting the mother to remain awake and alert. Although epidurals provide effective pain relief, they limit a mother's mobility during labor, which limits her ability to use nonpharmacological means to reduce pain such as walking or hydrotherapy. Epidurals are also associated with an increased risk that the fetus will have an abnormal heart rate and, in nonrandomized studies, an increased risk of cesarean delivery (Sakala and Corry, 2008). A nonrandomized study conducted in the United States found that mothers cared for by CNMs were less likely to receive epidural anesthesia during labor than mothers cared for by physicians and that the difference was statistically significant (Rosenblatt et al., 1997). This finding was consistent across comparisons between CNMs and family physicians and between CNMs and obstetricians. A second nonrandomized U.S. study reached the same conclusion (Cragin and Kennedy, 2006). These findings were corroborated by the meta-analysis of RCTs performed in other developed countries. A pooled analysis of results from

¹⁴ Amniotomy is a procedure in which the amniotic sac is ruptured by a health professional to induce labor or shorten the duration of labor.

the 11 RCTs that examined this outcome indicated that mothers cared for by licensed midwives were less likely to receive epidural anesthesia during labor and that the difference was statistically significant (Hattem et al., 2008).

Opiate analgesia

A meta-analysis of RCTs performed in other developed countries identified nine RCTs that had compared the risk of receiving opiate analgesia during labor between mothers cared for by licensed midwives and physicians. The pooled analysis of results from these nine RCTs found no statistically significant difference in the risk of receiving opiate analgesia during labor (Hattem et al., 2008).

Length of time in labor

A meta-analysis of RCTs performed in other developed countries identified two RCTs that had compared the mean length of time in labor for mothers cared for by licensed midwives and physicians. The pooled analysis of results from these two RCTs found no statistically significant difference in the mean length of labor (Hattem et al., 2008).

Induction of labor

Induction of labor for the convenience of the mother or the physician is not medically indicated and may increase the risk of cesarean delivery in mothers giving birth for the first time (Sakala and Corry 2008). A nonrandomized study conducted in the United States found that labor was less likely to be induced among mothers cared for by CNM than among mothers cared for by physicians and that the difference was statistically significant (Rosenblatt et al., 1997). This finding was consistent across comparisons between CNMs and family physicians and between CNMs and obstetricians. However, this finding was not corroborated by the meta-analysis of RCTs carried out in other developed countries. A pooled analysis of the 10 RCTs that evaluated this outcome found no statistically significant difference in the rate of labor induction (Hattem et al., 2008). The difference in results between the nonrandomized study and RCTs suggests that the results of the nonrandomized study may not have fully controlled for selection bias (i.e., mothers cared for by CNMs may have had a lower risk of labor induction than mothers cared for by physicians).

Cesarean birth

A cesarean delivery is necessary for the health of the newborn and/or mother under certain conditions, such as when the placenta has separated from the uterus before birth, the placenta has grown over the opening of the cervix, the umbilical cord precedes the baby's head through the birth canal, or the mother is infected with the human immunodeficiency virus and not well-controlled on antiretroviral medications. However, cesarean delivery is a major surgery that poses health risks for the mother and may adversely affect the infant's health (Sakala and Corry, 2008). Many of the cesareans performed in the United States are not medically necessary, and the U.S. Department of Health and Human Services has designated a reduction in the cesarean delivery rate as one of its Health People 2010 goals (Sakala and Corry, 2008). Three nonrandomized studies conducted in the United States found that mothers cared for by CNMs were less likely to have a cesarean delivery than mothers cared for by physicians and that the difference was statistically significant (Cragin and Kennedy, 2006; Heuston and Rudy, 1993; Rosenblatt et al., 1997). This finding was consistent across

comparisons between CNMs and family physicians and between CNMs and obstetricians. However, this finding was not corroborated by the meta-analysis of RCTs carried out in other developed countries. A pooled analysis of the 11 RCTs that evaluated this outcome found no statistically significant difference in the cesarean rate (Hattem et al., 2008). The difference in results between the nonrandomized study and RCTs suggests that the results of the nonrandomized study may not have fully controlled for selection bias (i.e., mothers cared for by CNMs may have had a lower risk of having a cesarean delivery than mothers cared for by physicians).

Use of forceps or vacuum extraction during delivery

Although the use of forceps or vacuum extraction can be helpful when a fetus is not progressing normally through the birth canal, these procedures pose some risk to newborn health. A nonrandomized study conducted in the United States reported that the rate of instrumental vaginal deliveries (i.e., deliveries during which either forceps or vacuum extraction was used) was higher among mothers cared for by physicians than among mothers cared for by CNMs and that the difference was statistically significant (Rosenblatt et al., 1997). This finding was consistent across comparisons between CNMs and family physicians and between CNMs and obstetricians. The meta-analysis of RCTs carried out in other developed countries had consistent findings. A pooled analysis of the 10 RCTs that evaluated this outcome found that mothers cared for by licensed midwives were less likely to have an instrumental delivery than mothers cared for by physicians (Hattem et al., 2008).

Spontaneous labor and vaginal birth

A nonrandomized study conducted in the United States reported that mothers cared for by CNMs were more likely to have spontaneous labor than mothers cared for by physicians and that the difference was statistically significant (Rosenblatt et al., 1997). This finding was consistent across comparisons between CNMs and family physicians and between CNMs and obstetricians. Another nonrandomized U.S. study found a statistically significant and favorable association between having a spontaneous vaginal birth and receiving care from a CNM (Cragin and Kennedy, 2006). The meta-analysis of RCTs carried out in other developed countries reported consistent findings. A pooled analysis of the nine RCTs that evaluated this outcome found that mothers cared for by licensed midwives were more likely to have a spontaneous vaginal birth than mothers cared for by physicians (Hattem et al., 2008).

Episiotomy

Routine use of episiotomy (i.e., an incision to enlarge the vaginal opening) is not recommended, because the procedure is associated with a greater risk of perineal injury and other complications (Sakala and Corry, 2008). A nonrandomized study conducted in the United States reported that the risk of receiving an episiotomy was lower among mothers cared for by CNMs than among mothers cared for by physicians and that the difference was statistically significant (Rosenblatt et al., 1997). This finding was consistent across comparisons between CNMs and family physicians and between CNMs and obstetricians. The meta-analysis of RCTs carried out in other developed countries corroborated these findings. A pooled analysis of the eleven RCTs that evaluated this outcome found that

mothers cared for by licensed midwives were less likely to have an episiotomy than mothers cared for by physicians (Hattem et al., 2008).

Perineal laceration needing suturing

A meta-analysis of RCTs performed in other developed countries identified seven RCTs that had compared the risk of having perineal lacerations requiring suturing between mothers cared for by licensed midwives and physicians. The pooled analysis of results from these seven RCTs found no statistically significant difference in this outcome (Hattem et al., 2008).

Intact perineum

A meta-analysis of RCTs performed in other developed countries identified eight RCTs that had compared the likelihood of having an intact perineum (i.e., no perineal lacerations) between mothers cared for licensed midwives and physicians. The pooled analysis of results from these eight RCTs found no statistically significant difference in this outcome (Hattem et al., 2008).

Length of mother's postpartum hospital stay

A meta-analysis of RCTs performed in other developed countries identified two RCTs that had compared the length of mother's postpartum hospital stay between mothers cared for by licensed midwives and physicians. The pooled analysis of findings from these two RCTs found that mothers cared for by licensed midwives had shorter postpartum hospital stays and that the difference was statistically significant (Hattem et al., 2008).

Length of neonatal hospital stay

A meta-analysis of RCTs performed in other developed countries identified two RCTs that had compared the length of the newborn's neonatal hospital stay between mothers cared for licensed midwives and physicians. The pooled analysis of findings from these two RCTs found that newborns delivered by licensed midwives had shorter neonatal hospital stays and that the difference was statistically significant (Hattem et al., 2008).

Breastfeeding initiation

A meta-analysis of RCTs performed in other developed countries identified one RCT that had compared rates of breastfeeding initiation between mothers treated by licensed midwives and physicians. This RCT found that mothers cared for by licensed midwives were more likely to initiate breastfeeding and that the difference was statistically significant (Hattem et al., 2008).

Mobility in labor

One nonrandomized study conducted in the United States reported that mothers cared for by CNMs were more mobile during labor (Cragin and Kennedy, 2006). This finding may reflect the lower rate of use of epidurals among CNMs' patients, because use of an epidural limits mobility.

The preponderance of evidence from nonrandomized studies conducted in the United States and RCTs performed in other developed countries indicates that mothers cared for by CNMs are more likely to have a spontaneous vaginal birth and are less likely to receive any anesthesia/analgesia, epidural anesthesia, and an episiotomy during labor. These studies also found that forceps and vacuum extraction are less likely to be used during deliveries of newborns whose mothers were cared for by CNMs. Results of RCTs conducted in other developed countries indicate that mothers cared for by CNMs have lower rates of prenatal hospitalizations than mothers treated by physicians, and higher rates of initiating breastfeeding. Nonrandomized studies performed in the United States report that receiving care from a CNM is associated with lower rates of labor induction and cesarean delivery, but these findings were not supported by the meta-analysis of RCTs carried out in other developed countries. RCTs conducted in other developed countries have found no difference in the mean number of prenatal visits received by mothers cared for by licensed midwives and physicians and the mean lengths of labor, mother's postpartum hospital stay, and newborn's neonatal stay. They also found no difference in rates of receipt of amniotomy, oxytocin, and opiate analgesia and in having perineal lacerations requiring suturing.

Summary of Findings

- Fetal and Infant Health Outcomes
 - A meta-analysis of RCTs conducted in other developed countries found that women who received maternity services from licensed midwives were less likely to experience fetal loss/neonatal death before 24 weeks of pregnancy, but found no difference in fetal loss/neonatal death after 24 weeks of pregnancy and no difference over the entire course of pregnancy.
 - One well-designed nonrandomized study conducted in the United States found that CNMs' patients had a lower risk of infant mortality than physicians' patients.
 - The preponderance of evidence from one RCT and three nonrandomized studies conducted in both the United States and a meta-analysis of RCTs conducted in other developed countries indicates that there are no differences in Apgar scores and in the risks of low birth weight, preterm birth, and admission to a neonatal intensive care unit between infants whose mothers received maternity services from CNMs or licensed midwives and those cared for by physicians.
- Maternal Health Outcomes
 - A meta-analysis of RCTs conducted in other developed countries found no differences in rates of prenatal hemorrhage, postpartum hemorrhage, and postpartum depression between mothers who received maternity services from licensed midwives and those cared for by physicians.
 - A nonrandomized study conducted in the United States found that mothers who received maternity services from CNMs were less likely to have a major perineal

laceration than mothers cared for by physicians but that rates of postpartum hemorrhage did not differ between the two groups.

- Process of Maternity Care Outcomes
 - The preponderance of evidence from nonrandomized studies conducted in the United States and a meta-analysis of RCTs conducted in other developed countries indicates that mothers cared for by CNMs are more likely to have a spontaneous vaginal birth and less likely to receive epidurals, intrapartum analgesia or anesthesia, and episiotomies or to have forceps or vacuum extraction used during delivery than mothers cared for by physicians.
 - A meta-analysis of RCTs conducted in other developed countries reported that mothers who received care from licensed midwives are less likely to be hospitalized during the prenatal period than mothers care for by physicians. Mothers and infants cared for by licensed midwives also had shorter lengths of stay for both postpartum and neonatal hospitalizations and were more likely to initiate breastfeeding.
 - Nonrandomized studies conducted in the United States suggest that mothers cared for by CNMs are less likely to have a cesarean birth or to have labor induced than mothers cared for by physicians, but these findings were not corroborated by the meta-analysis of RCTs conducted in other developed countries.
 - A meta-analysis of RCTs conducted in other developed countries found no differences in the number of prenatal visits received by mothers who received care from licensed midwives and those cared for by physicians. The meta-analysis also found no difference in the likelihoods of having an amniotomy, perineal lacerations needing suturing, and oxytocin or opiate analgesia during labor. The length of time in labor also did not differ.

UTILIZATION, COST, AND COVERAGE IMPACTS

Present Baseline Cost and Coverage

Current Coverage of the Mandated Benefit

Privately insured market

The California Health Benefits Review Program (CHBRP) surveyed the seven largest carriers in California to estimate the current coverage provisions of the leading carriers in California. Based on the responses of the six carriers that responded to the survey, representing 88.4% of the privately insured market, CHBRP determined that among California's privately insured population (including the group and individual market):

- 97% have coverage for certified nurse-midwife (CNM) services,
- 66% of members enrolled in Department of Managed Health Care (DMHC)-regulated plans currently have direct access to CNMs,
- 100% of members enrolled in California Department of Insurance (CDI)-regulated policies currently have direct access to CNMs since CDI-regulated policies typically allow members to seek OB/GYN services directly and since they have an out-of-network option.

Publicly insured market

Because Medi-Cal is a major payer for maternity services, and because the Medi-Cal Managed Care Program would be directly impacted by AB 259, CHBRP also conducted a survey of the three of the largest Medi-Cal Managed Care plans in California and contacted the Department of Health Care Services. Based on existing laws, responses from those Medi-Cal Managed Care plans and DHCS, CHBRP determined that among Medi-Cal Managed Care beneficiaries:

- 100% have coverage for CNM services (DHS, 2008),
- 50% have direct access to CNMs.

CalPERS health maintenance organization (HMO) plans are subject to mandate laws and therefore would be impacted by AB 259. CalPERS enrollees have access to coverage for CNM services to the extent that the contracting medical groups have a CNM within their network. Approximately half of the CalPERS enrollees have access to CNMs without a referral, if those members have a confirmed pregnancy and are seeking obstetrical care.

Access to Infants and Mothers (AIM) is a state program that provides health insurance to pregnant women who are in households 300% or below of the Federal poverty line. Given that AIM contracting plans are subject to mandate laws, those plans would also be impacted by AB 259. Although CHBRP was not able to obtain complete information on the practices of all AIM plans, a review of their publicly available Summary of Benefits indicate that, whereas CNM access is covered, *direct* access is not necessarily covered, and members may be required to obtain a referral to obtain services from a CNM.

Total coverage

Based on the research summarized above, CHBRP finds that among California's insured population:

- 98% currently have coverage for CNM services (Table 1),
- 67% currently have direct access to CNMs (Table 1).

Current Utilization Levels and Costs of the Mandated Benefit

Current utilization levels

Based on the Milliman's claims data, 427,000 deliveries are expected to occur in California in 2009 (Table 1) for the population that would be subject to AB 259. In recent years, about 8% of live births in California, or approximately 34,000 births (for women enrolled in plans that would be subject to AB 259) have been presided over by CNMs (Declercq et al., 2009; Martin et al, 2009).

Because of the limited availability of utilization data on use of CNM services in California, CHBRP is unable to provide additional information about baseline utilization within the state. Based on data from the National Center for Health Statistics, out-of-hospital births accounted for about 0.9% of live births in 2006, and about two-thirds of these (0.6%) were home births. CNMs presided over about 60% of these home births in 2006, a rate almost nine times higher than that of physicians.

Unit price

CHBRP estimates that the average cost per delivery in California is \$11,625 (Table 1). This average cost represents a weighted-average cost of \$9,667 per normal delivery (about 70% of total deliveries) and \$16,127 per cesarean delivery (about 30% of total deliveries). CHBRP finds no evidence that the average cost of normal deliveries differs between OB/GYNs and CNMs. There is also no evidence that cesarean deliveries differ in cost when prenatal care was provided by a CNM versus an OB/GYN, given that none of the available studies in the United States have demonstrated sufficient control for selection bias.

The Extent to Which Costs Resulting From Lack of Coverage Are Shifted to Other Payers, Including Both Public and Private Entities

Because an estimated 97.0% of privately insured Californians currently have coverage for CNM services, there is no firm evidence of cost shifting between public and private payers. In theory, the 3.0% of women with private coverage that does not cover CNM services might have an incentive to switch to Medi-Cal coverage, if they were eligible for Medi-Cal and they had a strong preference for access to a CNM as their primary care provider or for their maternity care. However, CHBRP has no reliable data for estimating this potential shift in coverage.

Public Demand for Coverage

As a way to determine whether public demand exists for the proposed mandate (based on criteria specified under Senate Bill 1704 [2007]), CHBRP is to report on the extent to which collective bargaining entities negotiate for, and the extent to which self-insured plans currently have, coverage for the benefits specified under the proposed mandate. CalPERS self-insured preferred provider organization (PPO) allow enrollees to have family planning, prenatal care, postpartum care, normal delivery, and routine newborn care provided directly by a CNM. CNMs assisting at normal or cesarean births are not covered.¹⁵

Based on conversations with the largest collective bargaining agents in California, CHBRP concluded that unions currently do not include access to specific provider types in their health insurance policy negotiations. In general, unions negotiate for broader contract provisions such as coverage for dependents, premiums, deductibles, and coinsurance levels.¹⁶

To further investigate public demand for benefits addressed by the bill, CHBRP surveyed a sample of health insurance carriers offering plans or policies to self insured groups and asked whether the relevant benefits differed from those offered in the commercial markets. The responding carriers indicated that there were no substantive differences.

Impacts of Mandated Coverage

How Would Changes in Coverage Related to the Mandate Affect the Benefit of the Newly Covered Service and the Per-Unit Cost?

Impact on supply and on the health benefit

As discussed in the *Introduction*, there are currently 1,910 active CNMs practicing in California, with four accredited programs in the state that train new CNMs. As will be discussed in the “How Would Utilization Change as a Result of the Mandate?” section below, there is inadequate evidence to determine whether AB 259 would increase women switching to CNMs for OB/GYN services. It is unlikely that any potential shifts in utilization would result in an impact on CNM supply.

As presented in the *Medical Effectiveness* section, CNM-attended births are associated with several positive health and utilization outcomes, including lower episiotomy rates, lower rates of hospitalization prior to delivery, and lower rates of cesarean delivery in comparison to physician-attended births. Therefore, although it is unclear whether AB 259 would lead to an increased utilization of CNM services, potential increases in the utilization of CNMs related to other factors (e.g., patient education) could potentially produce improved health

¹⁵ Personal communication with Pat Sherard, CalPERS, Division of Operations & Infrastructure Support, March 2009.

¹⁶ Personal communication with the California Labor Federation and member organizations, March 2009.

benefits and outcomes related to childbirth. These potential benefits are presented and discussed more fully in the *Public Health Impacts* section.

Impact on per-unit cost

CHBRP estimates that there would be no measurable impact on the per-unit costs of deliveries, maternity services, or primary care services, for the reasons discussed in the “Impact of the Mandate on Total Health Care Costs” section below.

How Would Utilization Change as a Result of the Mandate?

AB 259 would not be expected to impact the rates of overall deliveries in California for women enrolled in plans subject to AB 259 (Table 1).

Utilization impacts in this analysis are discussed in terms of changes in the use of CNMs for OB/GYN services. As discussed, for women who are enrolled in plans that would be subject to AB 259, CNMs preside over approximately 34,000 births, or 8% of live deliveries in California. The extent to which AB 259 would impact the use of CNMs would depend on whether prior authorization and referral requirements are currently a barrier to ultimately obtaining CNMs services for those members who demand those services. There is inadequate evidence to determine the number of members who may be demanding OB/GYN services from CNMs but are ultimately not able to obtain them due to preauthorization or referral requirements.

To What Extent Would the Mandate Affect Administrative and Other Expenses?

As discussed in the *Introduction*, AB 259 does not explicitly require plans or insurers to alter their provider networks or contractual arrangements. However, AB 259 may indirectly require plans or insurers to alter their provider networks to allow members direct access to CNMs. Although AB 259 states that health plans regulated by the DMHC are to provide access to “participating” CNMs, if plans do not have an adequate network to meet members’ demands for CNM services, plans may have to add CNMs to their networks. Plans may also be required to alter their provider directories to reflect the names and contact information of CNMs that participate in the plans’ network. On the other hand, if plans are permitted to restrict access to care to only participating CNMs and demonstrate adequacy of their network in terms of obstetrics-gynecological services (based on the full range of providers who are eligible to provide those services, including obstetricians and gynecologists and family physicians) then plans may currently be in compliance.^{17,18} In response to CHBRP’s carrier survey, some plans have stated that they believe the administrative costs associated with altering their networks would be great because they have interpreted the provision of AB 259 related to direct access to also ensure adequate networks of CNMs. PPOs, in the CDI-

¹⁷ Personal communication, Sherrie Lowenstein, Department of Managed Health Care, March 2009.

¹⁸ Because CDI-regulated products, such as preferred provider organizations, have out-of-network options, those insurers would be in compliance by allowing members to obtain care out of network. AB 259 would not prohibit those health insurance policies from charging members a differential cost sharing for seeking care out of network.

regulated market, already have an out-of-network option, therefore any administrative changes to comply with AB 259 would be minimal.

A potential decrease in administrative cost could be the elimination of an office visit to obtain a referral from a physician or other health care provider or the elimination of the preauthorization from a health plan in order for a member to obtain services directly from a CNM.

Impact of the Mandate on Total Health Care Costs

Changes in total expenditures

If AB 259 would result in more women choosing to seek OB/GYN services from CNMs, the potential shift toward greater use of CNMs would have no measurable change in total premiums, per-delivery cost, or total expenditures, for the following reasons (Table 2 and Table 3). CNMs are generally paid the same for their services as OB/GYNs, including a global fee for most deliveries, so payments for those services would not change under AB 259.

It is possible that requiring a referral before gaining access to CNM services may delay the receipt of early prenatal care among some women, but such delays are unlikely to have cost impacts because the vast majority of prenatal care is paid for through global fees to the attending provider. Although early initiation of prenatal care could also result in increased utilization of screening tests for genetic defects, CHBRP had no good data sources for estimating the cost impacts of such potential increases in prenatal screening.

CHBRP estimates that AB 259 would have no measurable impact on total health care expenditures in California. Although AB 259 may result in increased use of CNMs for maternity and OB/GYN services, there is no reliable, scientifically valid evidence that switching from OB/GYNs to CNMs will produce a savings in total health expenditures.

Offsets

Although there is some evidence from nonrandomized studies regarding lower utilization rates of some maternity services, these studies do not adequately account for possible selection effects. The reductions in caesarian deliveries, induced labors, and epidural use from observational studies are not a scientifically reliable basis for estimating the potential cost savings associated with CNM-attended deliveries. Therefore, even if some portion of insured women switch from OB/GYNs to CNMs for their obstetrical and gynecological care, there is no scientifically valid evidence that measurable cost savings would be achieved.

Impact on long-term costs

CHBRP estimates no long-term cost impacts directly as a result of AB 259. Again, even if some portion of insured women switch from OB/GYNs, there is no scientifically valid evidence that measurable long-term cost saving would be achieved.

Impacts for Each Category of Payer Resulting from the Benefit Mandate

Changes in expenditures and PMPM amounts by payer category

CHBRP estimates no measurable impact on expenditures or PMPM amounts for any public or private payer.

Changes in coverage as a result of premium increases

CHBRP estimates no change in coverage as a result of AB 259 because it would have no measurable impact on insurance premiums.

Impact of changes in private coverage on public programs

CHBPR estimates that the mandate will produce no measurable impact on enrollment in public insurance programs or on utilization of covered benefits in the public sector.

Impact on Access and Health Service Availability

As discussed above, there is inadequate evidence to determine the number of members who may be demanding OB/GYN services but are ultimately not able to obtain them due to preauthorization or referral requirements. Information from the DMHC indicate that of the 51,371 complaints they have received (as of September, 2008), 83 were related to accessing CNM services. This includes accessing CNMs out of network (which is typically not covered for HMOs), coordination of care, and billing complaints. CHBRP's interviews with content experts in the field indicate that there is some evidence that women who prefer to receive their obstetrical or gynecological care from CNMs have been prevented from seeking care from a CNM because of the need for a referral.

For the 33.0% of insured Californians with coverage for CNM services who currently do not have direct access to CNMs without a referral, AB 259 would remove this potential barrier to access, and could in theory increase the availability of CNM services to those who previously could not self-refer. However, given a lack of evidence that this is a widespread problem, it is not likely that AB 259 would impact demand for CNM services or impact availability of CNM services.

Table 2. Baseline (Premandate) Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2009

	DMHC-Regulated							CDI-Regulated			Total Annual
	Large Group	Small Group	Individual	CalPERS(b)	Medi-Cal(c)		Healthy Families	Large Group	Small Group	Individual	
				HMO	Managed Care 65 and Over	Managed Care Under 65	Managed Care				
Total population in plans subject to state regulation (a)	11,100,000	2,844,000	966,000	820,000	159,000	2,366,000	715,000	400,000	932,000	1,038,000	21,340,000
Total enrolled in plans subject to AB 259	11,100,000	2,844,000	966,000	820,000	159,000	2,366,000	715,000	400,000	932,000	1,038,000	21,340,000
Average portion of premium paid by employer	\$279.83	\$246.48	\$0.00	\$321.26	\$239.00	\$128.09	\$74.97	\$341.25	\$288.13	\$0.00	\$58,443,353,000
Average portion of premium paid by employee	\$69.94	\$71.52	\$330.89	\$56.69	\$0.00	\$0.71	\$10.22	\$97.61	\$54.11	\$169.28	\$19,440,350,000
Total premium	\$349.77	\$318.00	\$330.89	\$377.95	\$239.00	\$128.80	\$85.19	\$438.86	\$342.24	\$169.28	\$77,883,703,000
Member expenses for covered benefits (deductibles, copayments, etc.)	\$18.90	\$24.61	\$54.10	\$19.49	\$0.00	\$0.59	\$2.32	\$53.72	\$124.95	\$41.39	\$6,384,077,000
Member expenses for benefits not covered	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
Total expenditures	\$368.67	\$342.62	\$385.00	\$397.44	\$239.00	\$129.39	\$87.51	\$492.58	\$467.19	\$210.66	\$84,267,780,000

Source: California Health Benefits Review Program, 2009.

Note: (a) This population includes privately insured (group and individual) and publicly insured (e.g., CalPERS, Medi-Cal, Healthy Families, AIM, MRMIP) individuals enrolled in health insurance products regulated by DMHC or CDI. Population includes enrollees aged 0-64 years and enrollees 65 years or older covered by employment sponsored insurance.

(b) Of these CalPERS members, about 59%, or 484,000, are state employees.

(c) Medi-Cal state expenditures for members under 65 years of age include expenditures for the Major Risk Medical Insurance Program (MRMIP) and the Access for Infants and Mothers (AIM) program. Medi-Cal state expenditures for members over 65 years of age include those with Medicare coverage.

Key: AIM=Access for Infants and Mothers; CalPERS=California Public Employees' Retirement System; CDI=California Department of Insurance; DMHC=Department of Managed Health Care; MRMIP=Major Risk Medical Insurance Program.

Table 3. Impacts of the Mandate on Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2009

	DMHC-Regulated							CDI-Regulated			Total Annual
	Large Group	Small Group	Individual	CalPERS(b)	Medi-Cal(c)		Healthy Families	Large Group	Small Group	Individual	
				HMO	Managed Care 65 and Over	Managed Care Under 65	Managed Care				
Total population in plans subject to state regulation (a)	11,100,000	2,844,000	966,000	820,000	159,000	2,366,000	715,000	400,000	932,000	1,038,000	21,340,000
Total Population in Plans Subject to AB 259	11,100,000	2,844,000	966,000	820,000	159,000	2,366,000	715,000	400,000	932,000	1,038,000	21,340,000
Average portion of premium paid by Employer	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0
Average portion of premium paid by Employee	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0
Total premium	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0
Member expenses for covered benefits (deductibles, copayments, etc.)	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0
Member expenses for benefits not covered	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0
Total expenditures	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0
Percentage Impact of Mandate											
Insured premiums	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
Total expenditures	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%

Source: California Health Benefits Review Program, 2009.

Note: (a) This population includes privately insured (group and individual) and publicly insured (e.g., CalPERS, Medi-Cal, Healthy Families, AIM, MRMIP) individuals enrolled in health insurance products regulated by DMHC or CDI. This population includes enrollees aged 0-64 years and enrollees 65 years or older covered by employment sponsored insurance.

(b) Of these CalPERS members, about 59%, or 484,000, are state employees.

(c) Medi-Cal state expenditures for members under 65 years of age include expenditures for the Major Risk Medical Insurance Program (MRMIP) and the Access for Infants and Mothers (AIM) program. Medi-Cal state expenditures for members over 65 years of age include those with Medicare coverage.

Key: AIM=Access for Infants and Mothers; CalPERS=California Public Employees' Retirement System; CDI=California Department of Insurance; DMHC=Department of Managed Health Care; MRMIP=Major Risk Medical Insurance Program.

PUBLIC HEALTH IMPACTS

Impact of the Proposed Mandate on the Public's Health

The Impact on the Health of the Community

As shown in the *Utilization, Cost, and Coverage Impacts* section, there are 21,340,000 insured Californians subject to AB 259; about 5,335,000 of these insured are women ages 15-44 years. Under AB 259, 33% (about 1.76 million) of the insured population would gain direct access to certified nurse-midwife (CNM) services as a result of the bill.

There are about 427,000 live births in California annually that would be subject to AB 259. Approximately 8% of these births are attended by CNMs (Declercq et al., 2009; Milliman, 2009). Because the AB 259 mandate removes an administrative barrier to care by CNMs, one might intuitively expect an increase in the number of women obtaining CNM care instead of physician care. However, based on this report's utilization analysis, the California Health Benefits Review Program (CHBRP) finds insufficient evidence to determine the impact AB 259 would have on CNM utilization. Therefore, CHBRP cannot project the impact on public health.

Due to insufficient evidence demonstrating a change in the number of women obtaining CNM care in response to AB 259, CHBRP cannot project an impact on public health.

The Impact on the Health of the Community Where Racial Disparities Exist

California's racial and ethnic diversity is reflected in its birth statistics. Of the more than 427,000 live births each year in California that would be subject to AB 259, over half (52.2%) are to Hispanic women, followed by non-Hispanic white women (27.4%), Asian women (11.2%), African-American women (5.3%), and Native American women (0.4%) (CDPH, 2008). Medi-Cal enrollees accounted for 46.8% of births in California in 2006 (CHCF, 2007). Latinos represent 53% of Medi-Cal enrollees, followed by whites (21%), blacks (10%), and Asian/Pacific Islanders (10%) (CHCF, 2007).

Racial and ethnic distinctions are important because of related health disparities. For example, the fetal mortality rate for African Americans is more than double that for white non-Hispanic women. African-American women also have a higher likelihood of cesarean delivery. Although the potential exists to mitigate these disparities through CNM care for low-risk women, CHBRP is not aware of data in the medical literature addressing the influence of race and ethnicity on provider selection. Nor is CHBRP aware of literature addressing whether possible differences in health outcomes related to CNM care exist for specific racial and ethnic groups.

CHBRP finds insufficient evidence demonstrating a change in CNM utilization in response to AB 259. Therefore, CHBRP cannot project the bill's impact on racial and ethnic health disparities. In addition, even if overall utilization of CNMs changed in response to AB 259, CHBRP is unable to determine the impact for specific racial and ethnic populations due to lack of data regarding CNM and physician use and resulting health outcomes among these populations.

The Extent to Which the Proposed Service Reduces Premature Death and the Economic Loss Associated With Disease.

Included in many of CHBRP's public health impact analyses is an estimate of the extent to which the proposed change impacts premature death and economic loss (including non-health-related economic outcomes) associated with a condition or provider. For each specific health outcome reviewed in the literature, and for which there are baseline health outcomes data available, the estimated impact on each health outcome is applied to the affected population to determine the overall change in outcomes resulting from the mandate (CHBRP, 2009). In the case of AB 259, CHBRP finds insufficient evidence indicating a change in the utilization of CNMs, and therefore, we cannot project a change in any of the aforementioned areas.

CHBRP finds insufficient evidence demonstrating a change in utilization of CNMs in response to AB 259. Therefore, CHBRP cannot project a change in premature deaths, economic losses, or relevant non-health-related economic outcomes.

Long-Term Public Health Impacts

In cases where expected results of an intervention (in this case, increased access to CNM care) may not be realized within the 1-year time frame usually used for quantitative estimates of effects, the Public Health team projects the longer-term public health impacts associated with a benefit mandate, relying on qualitative information from longitudinal studies and other research as available. This is especially relevant for preventive care and disease management programs where the benefits accrue over many years, or where behavioral changes may take hold over a longer time period (CHBRP, 2009). In the case of AB 259, however, insufficient data are available to project long-term health impacts.

In the absence of sufficient evidence demonstrating a change in utilization of CNMs in response to AB 259, CHBRP cannot project any long-term health impacts.

Alternative Scenario

Although CHBRP anticipates no public health impact with the passage of AB 259, it is useful to provide some estimates of public health impact, *albeit with caveats*, should utilization change in the long term. To estimate the impact of CNM care, Appendix E summarizes the effect on spontaneous vaginal births should the proportion of births attended by CNMs increase by 1, 3, and 5 percentage points (i.e., from the current baseline for CNM-attended births of 8% to 9%, 11%, and 13%, respectively). Caveats regarding the alternative scenario are detailed in Appendix E.

APPENDICES

Appendix A: Text of Bill Analyzed

BILL NUMBER: AB 259 INTRODUCED
BILL TEXT

INTRODUCED BY Assembly Member Skinner

FEBRUARY 11, 2009

An act to amend Section 1367.695 of the Health and Safety Code, and to amend Section 10123.84 of the Insurance Code, relating to health care coverage.

LEGISLATIVE COUNSEL'S DIGEST

AB 259, as introduced, Skinner. Health care coverage: certified nurse-midwives: direct access.

Existing law, the Knox-Keene Health Care Service Plan Act of 1975, provides for the licensure and regulation of health care service plans by the Department of Managed Health Care and makes a willful violation of that act a crime. Existing law provides for the regulation of health insurers by the Department of Insurance.

Existing law requires a health care service plan contract or health insurance policy to allow an enrollee or policyholder the option to seek obstetrical and gynecological physician services directly from an obstetrician and gynecologist or a family practice physician and surgeon, subject to specified provisions established by the plan or insurer.

This bill would additionally require a health care service plan contract or health insurance policy to allow an enrollee or policyholder the option to seek obstetrical and gynecological services from a certified nurse-midwife, as specified. The bill would specify that a violation of this requirement with respect to health care service plans shall not be a crime. The bill would also make other conforming changes and would delete certain obsolete language.

Vote: majority. Appropriation: no. Fiscal committee: no.
State-mandated local program: no.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 1367.695 of the Health and Safety Code is amended to read:

1367.695. (a) The Legislature finds and declares that the unique, private, and personal relationship between women patients and their ~~obstetricians~~ obstetrical and ~~gynecologists~~

gynecological providers warrants direct access to obstetrical and gynecological ~~physician~~ services.

(b) Commencing January 1, ~~1999~~ 2010, every health care service plan contract issued, amended, renewed, or delivered in this state, except a specialized health care service plan contract, shall allow an enrollee the option to seek obstetrical and gynecological ~~physician~~ services directly from ~~a~~ any of the following health care providers, provided that the services fall within the scope of practice of that provider:

(1) A participating obstetrician and ~~gynecologist or directly from a~~ gynecologist.

(2) A participating certified nurse-midwife.

(3) A participating family practice physician and surgeon designated by the plan as providing obstetrical and gynecological services.

(c) In implementing this section, a health care service plan may establish reasonable provisions governing utilization protocols and the use of obstetricians and gynecologists, certified nurse-midwives, or family practice physicians and surgeons, as provided for in subdivision (b), participating in the plan network, medical group, or independent practice association, provided that these provisions shall be consistent with the intent of this section and shall be those customarily applied to other physicians and surgeons, such as primary care physicians and surgeons, to whom the enrollee has direct access, and shall not be more restrictive for the provision of obstetrical and gynecological ~~physician~~ services. An enrollee shall not be required to obtain prior approval from another physician, another provider, or the health care service plan prior to obtaining direct access to obstetrical and gynecological ~~physician~~ services, but the plan may establish reasonable requirements for the participating obstetrician and gynecologist, certified nurse-midwife, or family practice physician and surgeon, as provided for in subdivision (b), to communicate with the enrollee's primary care physician and surgeon regarding the enrollee's condition, treatment, and any need for followup care.

(d) This section shall not be construed to diminish the provisions of Section 1367.69.

~~—(e) The Department of Managed Health Care shall report to the Legislature, on or before January 1, 2000, on the implementation of this section.~~

(e) Notwithstanding Section 1390, a violation of this section, as it related to direct access to nurse-midwives, the amendments made to this section by the act adding this subdivision shall not be a crime.

SEC. 2. Section 10123.84 of the Insurance Code is amended to read:

10123.84. (a) The Legislature finds and declares that the unique, private, and personal relationship between women patients and their ~~obstetricians~~ obstetrical and ~~gynecologists~~ gynecological providers warrants direct access to obstetrical and gynecological ~~physician~~ services.

(b) Commencing January 1, ~~1999~~ 2010, every policy of ~~disability insurance that covers hospital, medical, or surgical expenses, and~~ health insurance that is issued, amended, delivered, or renewed in this state ~~—~~ shall allow a policyholder the option to seek obstetrical and gynecological ~~physician~~ services directly from ~~an~~ any of the following health care providers, provided that the services fall within the scope of practice of that provider:

(1) An obstetrician and ~~gynecologist or directly from a~~ gynecologist.

(2) A certified nurse-midwife.

(3) A participating family

practice physician and surgeon designated by the ~~plan~~ insurer as providing obstetrical and gynecological services.

(c) In implementing this section, ~~a disability~~ an insurer may establish reasonable provisions governing utilization protocols and the use of obstetricians and gynecologists, certified nurse-midwives, or family practice physicians and surgeons, as provided for in subdivision (b), provided that these provisions shall be consistent with the intent of this section and shall be those customarily applied to other physicians and surgeons, including primary care physicians and surgeons, to whom the policyholder has direct access, and shall not be more restrictive for the provision of obstetrical and gynecological ~~physician~~ services. A policyholder shall not be required to obtain prior approval from another physician, another provider, or the insurer prior to obtaining direct access to obstetrical and gynecological ~~physician~~ services, but the insurer may establish reasonable requirements for the participating obstetrician and gynecologist, the certified nurse-midwife, or the family practice physician and surgeon, as provided in subdivision (b), to communicate with the policyholder's primary care physician regarding the policyholder's condition, treatment, and any need for followup care.

(d) This section shall not be construed to diminish the provisions of Section 10123.83.

~~—(e) The Insurance Commissioner shall report to the Legislature, on or before January 1, 2000, on the implementation of this section.~~

Appendix B: Literature Review Methods

Appendix B describes methods used in the medical effectiveness literature review for AB 259, a bill that would require health plans to permit women to obtain care from a certified nurse-midwife (CNM) without a referral from a physician.

To assess the medical effectiveness of requiring health plans and insurers to permit women to self-refer to CNMs, a literature search was conducted to retrieve studies that compared the effectiveness of CNMs and physicians in providing health care services to women and infants. The literature search was limited to articles published in English. Because CNMs in California must meet educational requirements specified in the Business and Professions Code, and must be licensed and certified by the California Board of Registered Nursing, only studies of licensed midwives in other developed countries were included. In developing countries, many midwives are “lay” midwives who have no formal education in maternity care. The search encompassed studies of the effects of CNMs and physicians on health outcomes as well as studies of their impact on processes of maternity care, such as rates of use of epidural anesthesia and cesarean delivery.

The search encompassed all pertinent studies published from 1979 to present. PubMed (Medline), the Cochrane Library, the Cumulative Index of Nursing and Allied Health Literature, the Web of Science, EconLit, and Business Source Complete were searched. Web sites maintained by the following organizations were also searched: the Agency for Healthcare Research and Quality, the Institute for Clinical Systems Improvement, the International Network of Agencies for Health Technology Assessment, the National Guideline Clearinghouse, the National Health Service Centre for Reviews and Dissemination, the National Institute for Health and Clinical Excellence, the National Institutes of Health, the Scottish Intercollegiate Guideline Network, and the World Health Organization.

A total of 173 citations were retrieved. At least two reviewers screened the title and abstract of each citation returned by the literature search to determine eligibility for inclusion. The reviewers obtained the full text of articles that appeared to be eligible for inclusion in the review and reapplied the initial eligibility criteria. Studies of licensed midwives in the United States who are not CNMs were excluded because AB 259 only applies to CNMs. Seven pertinent studies were identified and reviewed. They included one meta-analysis of randomized controlled trials (RCTs) conducted in other developed countries and six individual RCTs and nonrandomized studies conducted in the United States.

All but one of the RCTs of the comparative effectiveness of licensed midwives and physicians retrieved were conducted in developed countries other than the United States. Although these studies have strong designs for assessing whether differences in outcomes are due to differences in the professionals providing care, their findings may not be generalizable to CNMs and physicians in California for several reasons. First, the training received by CNMs in the United States is not identical to the training received by licensed midwives in other developed nations. As noted in the *Introduction*, CNMs are required to be a licensed registered nurse (RN) and be certified in nurse-midwifery by the California Board of Registered Nursing (BRN). In other developed nations, licensed midwives do not necessarily have prior education in nursing.

Second, most studies conducted in other developed countries often compare licensed midwives to general practice physicians, whereas in the United States, most pregnant women receive care from obstetrician/gynecologists. Third, the other developed countries in which these RCTs have been performed have universal coverage through national or provincial health insurance plans. Pregnant women in countries with universal coverage may have different patterns of seeking prenatal care and national or provincial health insurance plans may have more restrictive clinical practice guidelines than health plans than those issued in the United States.

To ensure that the findings of this analysis would be generalizable to persons enrolled in health plans in California to which AB 259 would apply, the medical effectiveness review incorporated nonrandomized studies conducted in the United States as well as RCTs conducted in both the United States and other developed countries. Results of nonrandomized studies that compare CNMs and physicians are more likely to be confounded by selection bias than RCTs because there is a greater risk that the populations cared for by the two groups of providers may differ in ways that would affect the outcome of analyses. For example, it is possible that women cared for by CNMs are healthier than women cared for by physicians and, thus, are at lower risk for having poor birth outcomes or delivering by cesarean delivery. On the other hand, the results of comparisons of CNMs and physicians in the United States are more likely to reflect differences in outcomes and processes of care for mothers and infants treated by these two groups of providers in California and, thus, to be more generalizable to California. In addition, all of the nonrandomized studies included in the review used multivariate statistical methods to control for potential selection bias. Although this design is not as strong as an RCT, it does rule out some of the more obvious alternative explanations for differences in outcomes between CNMs' and physicians' patients.

In making a “call” for each outcome measure, the team and the content expert consider the number of studies as well the strength of the evidence. To grade the evidence for each outcome measured, the team uses a grading system that has the following categories:

- Research design
- Statistical significance
- Direction of effect
- Size of effect
- Generalizability of findings

The grading system also contains an overall conclusion that encompasses findings in these five domains. The conclusion is a statement that captures the strength and consistency of the evidence of an intervention's effect on an outcome. The following terms are used to characterize the body of evidence regarding an outcome.

- Clear and convincing evidence
- Preponderance of evidence

- Ambiguous/conflicting evidence
- Insufficient evidence

The conclusion states that there is “clear and convincing” evidence that an intervention has a favorable effect on an outcome, if most of the studies included in a review are well-implemented, randomized controlled trials (RCTs) and report statistically significant and clinically meaningful findings that favor the intervention.

The conclusion characterizes the evidence as “preponderance of evidence” that an intervention has a favorable effect if most but not all five criteria are met. For example, for some interventions, the only evidence available is from nonrandomized studies or from small RCTs with weak research designs. If most such studies that assess an outcome have statistically and clinically significant findings that are in a favorable direction and enroll populations similar to those covered by a mandate, the evidence would be classified as a “preponderance of evidence favoring the intervention.” In some cases, the preponderance of evidence may indicate that an intervention has no effect or has an unfavorable effect.

The evidence is presented as “ambiguous/conflicting” if their findings vary widely with regard to the direction, statistical significance, and clinical significance/size of the effect.

The category “insufficient evidence” of an intervention’s effect is used where there is little if any evidence of an intervention’s effect.

The search terms used to locate studies relevant to the AB 259 were as follows:

Medical Subject Headings (MeSH)—PubMed, CINAHL, Cochrane Library

(Note: The PubMed format is below. MeSH terms were entered in the appropriate format for each database. See Search Strategy document for formats.)

Adolescent
 Adult
 Anesthesia, Obstetrical
 Apgar Score
 Birthing Centers
 California
 Cesarean Section/utilization
 Cohort Studies
 Continuity of Patient Care/standards
 Contraception Methods
 Cost- Benefit Analysis
 Cost Savings
 Costs and Cost Analysis

Counseling
Delivery, Obstetric
Depression, Postpartum
Episiotomy
Family Planning Services
Family Practice/economics/manpower/methods/organization &
administration/standards/statistics & numerical data/ supply and distribution/trends/utilization
Female
Gynecology/economics/manpower/methods/organization & administration/standards/statistics &
numerical data/ supply and distribution/trends/utilization
Health Care Costs
Health Services Accessibility
Home Childbirth
Hospitalization
Infant
Infant, Low Birth Weight
Infant Mortality
Infant, Newborn (explode)
Intensive Care, Neonatal
Labor, Obstetrics
Length of Stay
Maternal Child Health Services
Maternal Health Services/economics/standards
Maternal Mortality
Medically Underserved Area
Midwifery/economics/manpower/methods/organization & administration/standards/statistics &
numerical data/ supply and distribution/trends/utilization
Natural Childbirth
Neonatal Care
Neonatal Screening
Nurse Midwives/economics/manpower/methods/organization &
administration/standards/statistics & numerical data/ supply and distribution/trends/utilization
Nursing Evaluation Research
Obstetrics/economics/manpower/methods/organization & administration/statistics & numerical
data/supply and distribution/trends/utilization
Outcome Assessment (Health Care)
Outcomes (Health Care)
Patient Satisfaction
Pediatrics/economics/manpower/methods/organization & administration/ statistics & numerical
data/ supply and distribution/trends/trends/utilization
Physicians/economics/manpower/methods/organization & administration statistics & numerical
data/ standards/supply and distribution/trends/utilization
Physicians, Family/economics/manpower/methods/organization & administration/statistics &
numerical data/ standards/supply and distribution/trends/utilization
Physician's Practice Patterns/standards
Postnatal Care

Postpartum Period
Pregnancy
Pregnancy Outcome
Premature Birth
Prenatal Care/methods/organization & administration/standards
Prospective Studies
Quality of Health Care
Randomized Controlled Trials as Topic
Rural Health
Socioeconomic Factors
Treatment Outcome
Women

Publication Type:

Comparative Studies
Controlled Clinical Trial
Evaluation Studies
Meta-Analysis
Multicenter Studies
Randomized Controlled Trial

Subset:

Systematic Reviews

Keywords:

Access, anesthesia, ante partum, Apgar, Cesarean, California, certified nurse midwi*, childbirth, CNM*, cohort, comparative, comparison, contraception counseling, cost effective*, cost*, delivery, delivery of bab*, direct access, direct care, effective*, efficacy, episiotomy, evaluation, family planning, family physician*, family practice, free-standing birth center*, gynecolog*, home birth, home delivery, hospital delivery, hospital stay, infant, intrapartum, labor, low birth weight, maternal care, maternity, midwi*, neonatal, neonatal intensive care, newborn*, nurse midwi*, nurse midwife*, obstetric*, outcome*, physician*, postnatal care, postpartum, pregnancy, pregnancy complication*, pregnancy outcome*, premature, prenatal care, preterm, primary care provider*, prospective stud*, referral*, referred, spontaneous vaginal birth, supply, trends, unintended pregnancy, utilization

* indicates that the term was truncated to retrieve articles in which multiple variations on the term appeared.

The combination of MeSH terms and keywords was used to search Web of Science, Business Sources Complete, and EconLit.

Appendix C: Description of Studies Comparing Midwife and Physician Care

Appendix C describes the meta-analyses, systematic reviews, and individual studies on the effectiveness of midwives in delivering maternity and family planning services that were analyzed by the medical effectiveness team. Table C-1 present information regarding the citation, type of study, type of study, topic studied, population study, and the location at which a study was conducted. Table C-2 describes methods to reduce selection bias in the U.S. studies. Table C-3-a through Table C-3-c lists studies that assessed the following: fetus/infant health outcomes, maternal health outcomes, process of maternal care. There was no comparative literature on family planning outcomes.

Table C-1. Summary of Published Studies on Effectiveness of Midwife Care on Maternity Care

Citation	Type of Trial	Topic	Population Studied	Location
Hatem at al., 2008	Meta-analysis	Midwife ¹ -led care versus obstetrician, family doctor, or share care ²	Not at risk women and their infants	Australia, Canada, NZ, and UK
Heins et al., 1990	RCT	Nurse-midwife versus obstetrician prenatal care	High-risk for low-birth weight mothers	US
Cragin and Kennedy, 2006	Prospective	Certified nurse-midwife (CNM) versus physician care	Moderate risk women	US
MacDorman and Singh, 1997	Retrospective	CNM versus physician care	Women who delivered a baby by a physician or certified midwife	US Nation
Rosenblatt et al., 1997	Retrospective chart review	CNM versus obstetrician versus. family doctor care	Low- risk women	US
Davis et al., 1994	Retrospective	CNM versus obstetrician care	Low-risk women private insurance	US
Oakley et al., 1996	Prospective	CNM versus obstetrician care	Low-risk women	US
Hueston and Rudy, 1993	Retrospective chart review	Nurse-midwife versus family physician care	Women who delivered a baby in a rural US medical center	US

¹Midwife refers to a licensed midwife such as nurse-midwife or hospital midwife and excludes lay or traditional midwives.

² Shared care refers to the shared responsibility among different health professionals (may include midwives) in the delivery of care.

³Certified nurse-midwife refers to registered nurses in the United States who have completed additional education leading to a master's degree or certification in nurse midwifery.

Table C-2. Methods to Reduce Selection Bias in U.S. Studies

Citation	Type of Trial	Population	Study Inclusion Criteria	Multivariate Controls
Heins et al., 1990	RCT	High-risk for low-birth weight mothers	Women with none of the following conditions: Hypertension, diabetes, renal disease, or multiple pregnancies. And, who had scored 10 or more points on a risk index that assesses risk for delivering a low birth weight baby. (Previously published index).	Demographics
Cragin and Kennedy, 2006	Prospective	Moderate risk women	Moderate risk was defined as having three or more medical or psychosocial risk factors for poor pregnancy. Women with very high-risk conditions were excluded.	Uses the Perinatal Background Index that assesses 14 demographic and health status factors that exist before the current pregnancy that may influence outcomes or processes of care.
MacDorman and Singh, 1997	Retrospective	Women who delivered a baby by a physician or certified midwife	Women who had singleton, vaginal deliveries since midwives do not perform caesarean sections and perform fewer multiple deliveries	Race/ethnicity; age; birth order; marital status; maternal education; start of prenatal care; gestational age; hydramnios; abruption placenta; breech/malpresentation; fetal distress; labor length; premature rupture of membrane; seizures;
Rosenblatt et al., 1997	Retrospective chart review	Low-risk women	Women with none of the following characteristics: history of concurrent major medical condition or major obstetric complications; potential risk factors in current pregnancy, including first prenatal visit after first trimester; more than three previous live births; history of drug or alcohol abuse; less than 17 or greater than 35 years or age; and , insured.	Patient and Provider Demographics
Davis et al., 1994	Retrospective	Low-risk women private insurance	Women with none of the following fetal and maternal factors: Multiple gestation; malpresentation; placenta previa or abruption; preeclampsia; diabetes; intrauterine growth	Maternal age, race, parity, gestational age, oxytocin augmentation or induction analgesia or epidural anesthesia, birth weight.

Citation	Type of Trial	Population	Study Inclusion Criteria	Multivariate Controls
			retardation; chronic hypertension; cord prolapse; elective cesarean section; and, being an indigent clinical services patient. 92% of CNM and 68% of physician patients were included in the final sample.	
Oakley et al., 1996	Prospective	Low-risk women	Women with none of the following factors: Hypertension requiring medication during pregnancy; chronic renal or lung disease; drug addiction; current alcoholism; seizure disorder requiring medication; psychiatric illness requiring medication; multiple gestations; or, planned cesarean delivery.	A "Preference Score" that is a count of the following procedures that the woman said she definitely wanted, including the following: pain medications, induction of labor, intravenous fluids, electronic fetal monitoring, stirrups for delivery, and episiotomy. Other controls factors include having a previous infant weighing less than 5 lb; a prior cesarean delivery; parity; income; history of physical, emotional, or sexual abuse before the pregnancy; expression of fear or anxiety about the pregnancy; stressful life events, financial difficulties, unplanned pregnancy, or other social threats
Hueston and Rudy, 1993	Retrospective chart review	Women who delivered a baby in a rural U.S. medical center	Women who no previous elective cesarean section.	Parity and number of preexisting health conditions

Table C-3. Summary of Findings from Studies of the Effectiveness of Midwifery Care as It Relates to Fetus/Infant Health Outcomes, Maternal Health Outcomes, and Process of Maternal Care

Table C-3-a. Fetus Infant Health Outcomes

Citation	Research Design	Comparison	Outcome	Statistical Significance	Direction of Effect	Size of Effect
1. Fetus Mortality						
Hatem at al., 2008	Level I: 8 of 8	Midwife versus obstetrician/family doctor care or shared care ¹	Fetal loss/neonatal death before 24 weeks	Sig	Fav	RR: 0.79 (0.65 to 0.97)
	Level I: 9 of 9		Fetal loss/neonatal death at 24 + weeks	No difference		
	Level I: 10 of 10		Overall fetal loss and neonatal death	No difference		
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus obstetrician and family physician care	Live births	No difference		
MacDorman and Singh, 1997	Level III: 1 of 1	CNM versus physician	Infant mortality	Sig	Fav	OR: 0.81 (0.68 to 0.96)
2. Apgar Scores						
Hatem at al., 2008	Level 1: 8 of 8	Midwife versus obstetrician/ family doctor care or shared care ¹	5-minute Apgar score below or equal to 7	No difference		
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus obstetrician	5-minute Apgar score	No difference		
			5 minute Apgar greater than 7	No difference		

3. Birthweight						
Hatem at al., 2008	Level I: 5 of 5	Midwife versus obstetrician/ Family doctor care or shared care ¹	Low birth weight	No difference		
Rosenblatt et al., 1997	Level III 1 of 1	CNM versus obstetrician and family physician	Birth weight	No difference		
Heins et al., 1990	Level II: 1 of 1	Midwife versus obstetrician care prenatal care	Delivering a low birth weight baby (< 1500 g)	No difference		
			Delivering a low birth weight baby (1500-2499g)	No difference		
4. Preterm Birth						
Hatem at al., 2008	Level I: 5 of 5	Midwife versus obstetrician/ family doctor care or shared care ¹	Preterm birth	No difference		
5. ICU						
Hatem at al., 2008	Level I: 10 of 10	Midwife versus obstetrician/ family doctor care or shared care ¹	Admission to neonatal ICU or nursery	No difference		
6. Adverse Situations						
Rosenblatt et al., 1997	Level III 1 of 1	CNM versus obstetrician and family physician care	Vertex presentation	No difference		
Oakley et al., 1996	Level III 1 of 1	CNM versus obstetrician care	Abrasion	No difference		

Table C-3-b. Maternal Health Outcomes

Citation	Research Design	Comparison	Outcome	Statistical Significance	Direction of Effect	Size of Effect
1. Prenatal Hemorrhages						
Hatem at al., 2008	Level I: 4 of 4	Midwife versus obstetrician/ family doctor care or shared care ¹	Number of prenatal hemorrhages	No difference		
2. Postpartum Hemorrhages						
Hatem at al., 2008	Level I: 7 of 7	Midwife versus obstetrician/ family doctor care or shared care ¹	Postpartum hemorrhage (defined by author)	No difference		
Oakley et al., 1996	Level III: 1 of 1	CNM versus obstetrician care	Postpartum hemorrhage	No difference		
3. Postpartum Depression						
Hatem at al., 2008	Level I: 1 of 1	Midwife versus obstetrician/ family doctor care or shared	Postpartum depression	No difference		
4. Other Outcomes						
Oakley et al., 1996	Level III: 1 of 1	CNM versus obstetrician care	Major perineal laceration	Sig		Results not shown

Table C-3-c. Processes of Care

Citation	Research Design	Comparison	Outcome	Statistical Significance	Direction of Effect	Size of Effect
1. Prenatal Visits						
Hatem at al., 2008	Level I: 1 of 1	Midwife versus obstetrician/ family doctor care or shared care ¹	Number of prenatal visits	No difference		
2. Prenatal Hospitalizations						
Hatem at al., 2008	Level I: 5 of 5	Midwife versus obstetrician/ family doctor care or shared care ¹	Number of prenatal hospitalizations	Sig	Fav	RR: 0.90 (0.81 to 0.99)

3. Amniotomy						
Hatem at al., 2008	Level 1: 3 of 3	Midwife versus obstetrician/ family doctor care or shared care ¹	Amniotomy	No difference		
4. Oxytocin During Labor						
Hatem at al., 2008	Level 1: 10 of 10	Midwife versus obstetrician/ family doctor care or shared care ¹	Augmentation / artificial oxytocin during labor	No difference		
5. No or Fewer Analgesia or Anesthesia						
Hatem at al., 2008	Level 1: 5 of 5	Midwife versus obstetrician/ family doctor care or shared care ¹	No intrapartum analgesia/ anesthesia	Sig	Fav	RR: 1.16 (1.05 to 1.29)
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus obstetrician care	Fewer pudendal anesthesia	No difference		
			Fewer local anesthesia	No difference		
			Fewer other anesthesia	No difference		
			Other anesthesia	No difference		
			No use of anesthesia	Sig	Fav	p=0.001
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus physician care	Fewer pudendal anesthesia	No difference		
			Fewer local anesthesia	No difference		
			Fewer other anesthesia	No difference		
			Other anesthesia	No difference		
			No use of anesthesia	Sig	Fav	p=0.001
Cragin and Kennedy, 2006	Level III: 1 of 1	CNM versus physician care	Nonpharmacologic methods of pain relief	Sig	Fav	p=0.001
			Any pharmacologic agentss in labor	Sig	Fav	p=0.001

6. Epidural						
Hatem at al., 2008	Level 1: 11 of 11	Midwife versus obstetrician/ family doctor care or shared care ¹	Regional analgesia (epidural/spinal)	Sig	Fav	RR: 0.81 (0.73 to 0.91)
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus obstetrician care	Fewer epidurals	Sig	Fav	p=0.000
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus physician care	Fewer epidurals	Sig	Fav	p=0.01
Cragin and Kennedy, 2006	Level III: 1 of 1	CNM versus physician care	Epidural	Sig	Fav	p=0.001
7. Opiate Analgesia						
Hatem at al., 2008	Level 1: 9 of 9	Midwife versus obstetrician/ family doctor care or shared care ¹	Opiate analgesia	No difference		
8. Length of Time in Labor						
Hatem at al., 2008	Level 1: 2 of 2	Midwife versus obstetrician/ family doctor care or shared care ¹	Length of time in labor	No difference		
9. Induction of Labor						
Hatem at al., 2008	Level 1: 10 of 10	Midwife versus obstetrician/ family doctor care or shared care ¹	Induction of labor	No difference		
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus obstetrician care	Fewer induced or augmented labor	Sig	Fav	p=0.000
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus physician care	Fewer induced or augmented labor	Sig	Fav	p=0.001

10. Caesarean Birth						
Hatem at al., 2008	Level 1: 11 of 11	Midwife versus obstetrician/ family doctor care or shared care ¹	Caesarean birth	No difference		
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus obstetrician care	Elective cesarean delivery without labor	No difference		
			Cesarean	Sig	Fav	p=0.02
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus physician care	Elective cesarean delivery without labor	No difference		
			Cesarean	Sig	Fav	p=0.02
Cragin and Kennedy, 2006	Level III: 1 of 1	CNM versus physician care	Cesarean	Sig	Fav	p=0.004
Hueston and Rudy, 1993	Level III: 1 of 1	Nurse midwife versus family physician	Cesarean	Sig	Fav	RR: 2.79 (1.61 to 4.83)
Davis et al., 1994	Level III: 1 of 1	CNM versus obstetrician care	Cesarean	No difference		
11. Instrument Birth (Forceps, Vacuum)						
Hatem at al., 2008	Level 1: 10 of 10	Midwife versus obstetrician/ family doctor care or shared care ¹	Instrumental vaginal birth (forceps/vacuum)	Sig	Fav	RR: 0.86 (0.78 to 0.96)
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus obstetrician care	Vacuum extractor	No difference		
			Use of forceps	Sig	Fav	p=0.000
			Non-instrumental vaginal deliveries	Sig	Fav	p=0.000
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus physician care	Vacuum extractor	No difference		
			Use of forceps	Sig	Fav	p=0.001
			Non-instrumental vaginal deliveries	Sig	Fav	p=0.000

12. Spontaneous Vaginal Birth						
Hatem at al., 2008	Level 1: 9 of 9	Midwife versus obstetrician/ family doctor care or shared care ¹	Spontaneous vaginal birth	Sig	Fav	RR: 1.04 (1.02 to 1.06)
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus obstetrician care	Spontaneous labor	Sig	Fav	p=0.000
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus physician care	Spontaneous labor	Sig	Fav	p=0.002
Cragin and Kennedy, 2006	Level III: 1 of 1	CNM versus physician care	Spontaneous vaginal delivery	Sig	Fav	p=0.004
13. Episiotomy						
Hatem at al., 2008	Level 1: 11 of 11	Midwife versus obstetrician/ family doctor care or shared care ¹	Episiotomy	Sig	Fav	RR: 0.82 (0.77 to 0.88)
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus obstetrician care	Lower Episiotomy rates	Sig	Fav	p=0.000
Rosenblatt et al., 1997	Level III: 1 of 1	CNM versus physician care	Lower Episiotomy rates	Sig	Fav	p=0.000
14. Perineal Laceration That Needs Suturing						
Hatem at al., 2008	Level 1: 7 of 7	Midwife versus obstetrician/ family doctor care or shared care ¹	Perineal laceration requiring suturing	No difference		
15. Intact Perineum						
Hatem at al., 2008	Level 1: 7 of 7	Midwife versus obstetrician/ family doctor care or shared care ¹	Intact perineum	No difference		
16. Duration of Postpartum Stay						
Hatem at al., 2008	Level 1: 2 of 2	Midwife versus obstetrician/ family doctor care or shared care ¹	Duration of postpartum hospital stay	Sig	Fav	MD: -0.14 (-0.33 to -0.04)

17. Length of Neonatal Hospital Stay						
Hatem at al., 2008	Level 1: 2 of 2	Midwife versus obstetrician/ family doctor care or shared care ¹	Length of neonatal hospital stay	Sig	Fav	MD: -2.00 (-2.15 to -1.85)
18. Breastfeeding Initiation						
Hatem at al., 2008	Level 1: 1 of 1	Midwife versus obstetrician/ family doctor care or shared care ¹	Breastfeeding initiation	Sig	Fav	RR: 1.35 (1.03 to 1.76)
19. Mobility in Labor						
Cragin and Kennedy, 2006	Level III: 1 of 1	CNM versus physician care	Mobility in labor	Sig	Fav	p = 0.001

Appendix D: Cost Impact Analysis: Data Sources, Caveats, and Assumptions

This appendix describes data sources, as well as general caveats and assumptions used in conducting the cost impact analysis. For additional information on the cost model and underlying methodology, please refer to the CHBRP Web site at http://www.chbrp.org/analysis_methodology/cost_impact_analysis.php.

The cost analysis in this report was prepared by the Cost Team which consists of CHBRP task force members and staff, specifically from the University of California, Los Angeles, and Milliman Inc. (Milliman). Milliman is an actuarial firm that provides data and analyses per the provisions of CHBRP's authorizing legislation.

Data Sources

In preparing cost estimates, the Cost Team relies on a variety of data sources as described below.

Private health insurance

The latest (2007) California Health Interview Survey (CHIS), which is used to estimate insurance coverage for California's population and distribution by payer (i.e., employment-based, privately purchased, or publicly financed). The biannual CHIS is the largest state health survey conducted in the United States, collecting information from over approximately 53,000 households. More information on CHIS is available at www.chis.ucla.edu/

The latest (2008) California Employer Health Benefits Survey is used to estimate:

- size of firm,
- percentage of firms that are purchased/underwritten (versus self-insured),
- premiums for plans regulated by the Department of Managed Health Care (DMHC) (primarily health maintenance organizations [HMOs] and Point of Service Plans [POS]),
- premiums for policies regulated by the California Department of Insurance (CDI) (primarily preferred provider organizations [PPOs] and fee-for-service plans [FFS]), and
- premiums for high deductible health plans (HDHPs) for the California population covered under employment-based health insurance.

This annual survey is currently released by the California Health Care Foundation/National Opinion Research Center (CHCF/NORC) and is similar to the national employer survey released annually by the Kaiser Family Foundation and the Health Research and Educational Trust. Information on the CHCF/NORC data is available at: www.chcf.org/topics/healthinsurance/index.cfm?itemID=133543.

Milliman data sources are relied on to estimate the premium impact of mandates. Milliman's projections derive from the Milliman Health Cost Guidelines (HCGs). The HCGs are a health care pricing tool used by many of the major health plans in the United States. See

www.milliman.com/expertise/healthcare/products-tools/milliman-care-guidelines/index.php.

Most of the data sources underlying the HCGs are claims databases from commercial health insurance plans. The data are supplied by health insurance companies, Blues plans, HMOs, self-funded employers, and private data vendors. The data are mostly from loosely managed healthcare plans, generally those characterized as preferred provider plans or PPOs. The HCGs currently include claims drawn from plans covering 4.6 million members. In addition to the Milliman HCGs, CHBRP's utilization and cost estimates draw on other data, including the following:

- The MEDSTAT MarketScan Database, which includes demographic information and claim detail data for approximately 13 million members of self-insured and insured group health plans.
- An annual survey of HMO and PPO pricing and claim experience. The most recent survey (2008 Group Health Insurance Survey) contains data from seven major California health plans regarding their 2007 experience.
- Ingenix MDR Charge Payment System, which includes information about professional fees paid for healthcare services, based upon approximately 800 million claims from commercial insurance companies, HMOs, and self-insured health plans.

These data are reviewed for applicability by an extended group of experts within Milliman but are not audited externally.

An annual survey by CHBRP of the seven largest providers of health insurance in California (Aetna, Anthem Blue Cross of California, Blue Shield of California, CIGNA, Health Net, Kaiser Foundation Health Plan, and PacifiCare) to obtain estimates of baseline enrollment by purchaser (i.e., large and small group and individual), type of plan (i.e., DMHC- or CDI-regulated), cost-sharing arrangements with enrollees, and average premiums. Enrollment in these seven firms represents 96.0% of the privately insured market: 98.0% of privately insured enrollees in full-service health plans regulated by DMHC and 82% of lives privately insured health insurance products regulated by CDI.

Public Insurance

Premiums and enrollment in DMHC- and CDI-regulated plans by self-insured status and firm size are obtained annually from CalPERS for active state and local government public employees and their family members who receive their benefits through CalPERS. Enrollment information is provided for fully funded, Knox-Keene¹⁹ licensed health care service plans covering non-Medicare beneficiaries—comprise about 75% of CalPERS total enrollment. CalPERS self-funded plans—approximately 25% of enrollment—are not subject to state mandates. In addition, CHBRP obtains information on current scope of benefits from health plans' evidence of coverage (EOCs) publicly available at www.calpers.ca.gov.

¹⁹ Health maintenance organizations in California are licensed under the Knox-Keene Health Care Services Plan Act, which is part of the California Health and Safety Code.

Enrollment in Medi-Cal Managed Care (Knox-Keene licensed plans regulated by DMHC) is estimated based on CHIS and data maintained by the Department of Health Care Services (DHCS). DHCS supplies CHBRP with the statewide average premiums negotiated for the Two-Plan Model, as well as generic contracts that summarize the current scope of benefits. CHBRP assesses enrollment information online at www.dhcs.ca.gov/dataandstats/statistics/Pages/BeneficiaryDataFiles.aspx.

Enrollment data for other public programs—Healthy Families, Access for Infants and Mothers (AIM), and the Major Risk Medical Insurance Program (MRMIP)—are estimated based on CHIS and data maintained by the Managed Risk Medical Insurance Board (MRMIB). The basic minimum scope of benefits offered by participating plans under these programs must comply with all requirements of the Knox-Keene Act, and thus these plans are affected by changes in coverage for Knox-Keene licensed plans. CHBRP does not include enrollment in the Post-MRMIP Guaranteed-Issue Coverage Products as these individuals are already included in the enrollment for individual health insurance products offered by private carriers. Enrollment figures for AIM and MRMIP are included with enrollment for Medi-Cal in presentation of premium impacts. Enrollment information is obtained online at www.mrmib.ca.gov/. Average statewide premium information is provided to CHBRP by MRMIB staff.

General Caveats and Assumptions

The projected cost estimates are estimates of the costs that would result if a certain set of assumptions were exactly realized. Actual costs will differ from these estimates for a wide variety of reasons, including:

- Prevalence of mandated benefits before and after the mandate may be different from CHBRP assumptions.
- Utilization of mandated services before and after the mandate may be different from CHBRP assumptions.
- Random fluctuations in the utilization and cost of health care services may occur.

Additional assumptions that underlie the cost estimates presented in this report are:

- Cost impacts are shown only for products subject to state-mandated health insurance benefits.
- Cost impacts are only for the first year after enactment of the proposed mandate
- Employers and employees will share proportionately (on a percentage basis) in premium rate increases resulting from the mandate. In other words, the distribution of premium paid by the subscriber (or employee) and the employer will be unaffected by the mandate.
- For state-sponsored programs for the uninsured, the state share will continue to be equal to the absolute dollar amount of funds dedicated to the program.

- When cost savings are estimated, they reflect savings realized for one year. Potential long-term cost savings or impacts are estimated if existing data and literature sources are available and provide adequate detail for estimating long-term impacts. For more information on CHBRP's criteria for estimating long-term impacts please see: http://www.chbrp.org/analysis_methodology/cost_impact_analysis.php.
- Several recent studies have examined the effect of private insurance premium increases on the number of uninsured (Chernew et al., 2005 Glied and Jack, 2003; Hadley, 2006). Chernew et al. estimate that a 10% increase in private premiums results in a 0.74 to 0.92 percentage point decrease in the number of insured, while Hadley (2006) and Glied and Jack (2003) estimate that a 10% increase in private premiums produces a 0.88 and 0.84 percentage point decrease in the number of insured, respectively. The price elasticity of demand for insurance can be calculated from these studies in the following way. First, take the average percentage point decrease in the number of insured reported in these studies in response to a 1-percent increase in premiums (about -0.088), divided by the average percentage of insured individuals (about 80%), multiplied by 100%, i.e., $\{[-0.088/80] \times 100\} = -0.11$. This elasticity converts the *percentage point* decrease in the number of insured into a *percentage* decrease in the number of insured for every 1-percent increase in premiums. Because each of these studies reported results for the large-group, small-group, and individual insurance markets combined, CHBRP employs the simplifying assumption that the elasticity is the same across different types of markets. For more information on CHBRP's criteria for estimating impacts on the uninsured please see: http://www.chbrp.org/analysis_methodology/cost_impact_analysis.php.

There are other variables that may affect costs, but which CHBRP did not consider in the cost projections presented in this report. Such variables include, but are not limited to:

- Population shifts by type of health insurance coverage: If a mandate increases health insurance costs, then some employer groups and individuals may elect to drop their coverage. Employers may also switch to self-funding to avoid having to comply with the mandate.
- Changes in benefit plans: To help offset the premium increase resulting from a mandate, health plan members may elect to increase their overall plan deductibles or copayments. Such changes would have a direct impact on the distribution of costs between the health plan and the insured person, and may also result in utilization reductions (i.e., high levels of patient cost sharing result in lower utilization of health care services). CHBRP did not include the effects of such potential benefit changes in its analysis.
- Adverse selection: Theoretically, individuals or employer groups who had previously foregone insurance may now elect to enroll in an insurance plan postmandate because they perceive that it is to their economic benefit to do so.
- Health plans may react to the mandate by tightening their medical management of the mandated benefit. This would tend to dampen the CHBRP cost estimates. The dampening would be more pronounced on the plan types that previously had the least effective medical management (i.e., PPO plans).

- Variation in existing utilization and costs, and in the impact of the mandate, by geographic area and delivery system models: Even within the plan types CHBRP modeled (HMO—including HMO and point of service (POS) plans—and non-HMO—including PPO and fee for service (FFS) policies), there are likely variations in utilization and costs by these plan types. Utilization also differs within California due to differences in the health status of the local commercial population, provider practice patterns, and the level of managed care available in each community. The average cost per service would also vary due to different underlying cost levels experienced by providers throughout California and the market dynamic in negotiations between health plans and providers. Both the baseline costs prior to the mandate and the estimated cost impact of the mandate could vary within the state due to geographic and delivery system differences. For purposes of this analysis, however, CHBRP has estimated the impact on a statewide level

Appendix E: Possible Public Health Impact of Alternative Scenario for Increased CNM Use

Although CHBRP anticipates no public health impact with the passage of AB 259, it is useful to provide some estimates of public health impact, *albeit with caveats*, should utilization of CNM care change in the longer term due to removal of a physician referral barrier. With the caveats outlined below, CHBRP identified spontaneous vaginal delivery (SVD) as an outcome for which there was consensus across both U.S. and non-U.S.-based studies and for which California data are available. SVD is the desired outcome for normal pregnancies because it is the natural culmination for normal pregnancies and is associated with low morbidity and mortality for both mother and child.

There is a preponderance of evidence in both randomized and nonrandomized studies that SVD is more likely for normal pregnancies attended by CNMs than by physicians. The magnitude of this effect is uncertain. Well-designed, randomized non-U.S. studies—with questionable applicability to California, as discussed below—suggest an approximately 4% greater likelihood of SVD for CNM-attended births compared to physician-attended births (Hatem, 2009). Nonrandomized U.S. studies—with better applicability than non-U.S. studies, but containing design flaws that may contribute to or directly cause an observed improvement in outcomes for CNM-attended births compared to physician-attended births—show a 22%-25% increased likelihood of SVD for CNMs (Cragin and Kennedy, 2006; Rosenblatt et al. 1997).

With the caveats (further outlined below) in mind, CHBRP estimated that, for every 1 percentage point increase in the proportion of California deliveries attended by midwives (corresponding to 4,270 births annually), the available literature suggests an increase of between 109 SVDs (based on well-designed non-U.S. studies that may not be applicable to the CA population) and 683 SVDs (based on nonrandomized U.S. studies with design flaws that may contribute to the apparent difference between CNM and physician care.) (Table E-1).

Caveats

With respect to outcomes, several caveats apply. First, CHBRP focused on one outcome: spontaneous vaginal births. CHBRP selected this outcome because there is a consensus among studies showing increased rates of spontaneous vaginal births for CNM-attended births and the availability of California data. However, this outcome does not cover the entire scope of practice for CNMs, nor does it represent all relevant outcomes of care. For example, the medical literature consistently shows lower episiotomy and epidural rates for CNMs than for physicians, but no California data were available to calculate possible reductions in those interventions. CNMs also provide care to nonpregnant women, including contraception and well-woman care, which also have public health importance. Therefore, it is possible that women choosing CNM care could experience results different from those experienced under physician care in outcome areas we are unable to address. If there is a net increase in women choosing CNM care over physician care in response to AB 259, this could have a public health effect not quantified here.

The final caveat involves the limitations in the literature for the chosen outcomes. The most credible studies are randomized clinical trials because they assure that patients treated by CNMs are compared to similar patients treated by physicians. The Cochrane report (Hatem et al., 2009)

was extremely helpful in reviewing randomized clinical trials relevant to AB 259. However, all such trials were performed outside the United States, albeit in English-speaking countries with primarily white populations. It is possible that the differences in the populations and medical care system of the United States may affect these results, and that results of these trials would not apply to the U.S. and/or California population. Studies in the United States, in contrast, were nonrandomized and with smaller study populations, and their results may not be as valid as those produced through randomized clinical trials. In particular, they may overestimate the apparent benefit from CNM care compared to physician care if physicians were more likely than CNMs to have medically complicated patients. Additionally, women's preferences related to cesarean deliveries and other interventions may influence their choice of a CNM or physician. Therefore, any observed improvement in health outcomes for CNM care compared to physician care may be due to patient self-selection rather than to the source of care.

Table E-1. Potential Change in Number of Spontaneous Vaginal Deliveries Should CNM-Attended Births Increase Above the Current 8% Baseline Percentage of California Births Attended by CNMs

	One Percentage-Point Increase In Births Attended by CNMs in California (9% of births)	Three Percentage-Point Increase In Births Attended by CNMs in California (11% of births)	Five Percentage-Point Increase In Births Attended by CNMs in California (13% of births)
Estimated additional births attended by CNMs due to increase in proportion of CNM-attended births	4,270	12,810	21,350
Estimated number of spontaneous vaginal deliveries among CNM-attended births (a)	2,733	8,198	13,664
Estimated increase in spontaneous vaginal births (assuming 4% more spontaneous vaginal births attended by CNMs) (b)	109	328	547
Estimated increase in spontaneous vaginal births (assuming 25% more spontaneous vaginal births attended by CNMs) (c)	683	2,050	3,416

Source: California Health Benefits Review Program, 2009.

Notes: (a) Data from the Centers for Disease Control and Prevention (2007) show that 64% of all deliveries are spontaneous vaginal deliveries. Thus, of the estimated additional births attended by CNMs in response to AB 259, this table row shows the number that would be expected to occur as spontaneous vaginal deliveries.

(b) Hatem et al., (2009), using randomized studies from outside the United States, estimated that CNM-attended births are 4% more likely to result in spontaneous deliveries than are births attended by physicians. This table row shows the increase in number of spontaneous deliveries that would be expected for CNM-attended births. e.g., for column 1, $0.04 \times 2,733 = 109$.

(c) Cragin and Kennedy (2006), using nonrandomized U.S. studies, estimated that CNM-attended births are 25% more likely to result in spontaneous deliveries than are births attended by physicians. This table row shows the increase in number of spontaneous deliveries that would be expected for CNM-attended births. e.g. for column 1, $0.25 \times 2,733 = 683$.

Key: CNM=certified nurse-midwife.

Appendix F: Information Submitted by Outside Parties

In accordance with CHBRP policy to analyze information submitted by outside parties during the first two weeks of the CHBRP review, the following parties chose to submit information.

No information was submitted directly by interested parties for this analysis.

For information on the processes for submitting information to CHBRP for review and consideration please visit: www.chbrp.org/requests.html.

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California Health Benefits Review Program Committees and Staff

A group of faculty and staff undertakes most of the analysis that informs reports by the California Health Benefits Review Program (CHBRP). The CHBRP **Faculty Task Force** comprises rotating representatives from six University of California (UC) campuses and three private universities in California. In addition to these representatives, there are other ongoing contributors to CHBRP from UC. This larger group provides advice to the CHBRP staff on the overall administration of the program and conducts much of the analysis. The CHBRP **staff** coordinates the efforts of the Faculty Task Force, works with Task Force members in preparing parts of the analysis, and coordinates all external communications, including those with the California Legislature. The level of involvement of members of the CHBRP Faculty Task Force and staff varies on each report, with individual participants more closely involved in the preparation of some reports and less involved in others.

As required by the CHBRP authorizing legislation, UC contracts with a certified actuary, Milliman Inc. (Milliman), to assist in assessing the financial impact of each benefit mandate bill. Milliman also helped with the initial development of CHBRP methods for assessing that impact.

The **National Advisory Council** provides expert reviews of draft analyses and offers general guidance on the program to CHBRP staff and the Faculty Task Force. CHBRP is grateful for the valuable assistance and thoughtful critiques provided by the members of the National Advisory Council. However, the Council does not necessarily approve or disapprove of or endorse this report. CHBRP assumes full responsibility for the report and the accuracy of its contents.

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