

Creating a Public Agenda for Maternity Safety and Quality in Cesarean Delivery

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Cesarean delivery rates in California and the United States rose by 50% between 1998 and 2008 and vary widely among states, regions, hospitals, and health care providers. The leading driver of both the rise and the variation is first-birth cesarean deliveries performed during labor. With the large increase in primary cesarean deliveries, repeat cesarean delivery now has emerged as the largest single indication. The economic costs, health risks, and negligible benefits for most mothers and newborns of these higher rates point to the urgent need for a new approach to working with women in labor. This commentary analyzes the high rates and wide variations and presents evidence of costs and risks associated with cesarean deliveries (complete discussion provided in the California Maternal Quality Care Collaborative White Paper at www.cmqqc.org/white_paper). All stakeholders need to ask whether society can afford the costs and complications of this high cesarean delivery rate and whether they can work together toward solutions. The factors involved in the rise in cesarean deliveries point to the need for a multistrategy approach, because no single strategy is likely to be effective or lead to sustained change. We outline complementary strategies for reducing the rates and offer recommendations including clinical improvement strategies with careful examination of labor management practices; payment reform to eliminate negative or perverse incentives; edu-

cation to recognize the value of vaginal birth; and full transparency through public reporting and continued public engagement.

Cesarean delivery rates in both California and the United States rose by 50% in the single decade between 1998 and 2008, climbing from 22% to 33% of all births.¹ This upward trend is seen for every type of woman regardless of race or ethnicity, age, weight, or the gestational age of the pregnancy and shows no signs of reversing. The increasing rates are largely the result of two factors: a significant rise in first-birth cesarean deliveries done in the course of labor and a marked decline in vaginal births after a prior cesarean delivery.

The risks and costs associated with cesarean deliveries are considerable, and it has not been possible to document any population-level benefit to women or newborns of rates higher than those seen in the late 1990s. In 2011, The Joint Commission stated this finding succinctly: "There are no data that higher rates improve any outcomes, yet the C-section rates continue to rise."² In part because major complications are rare with a first surgery, the risks of a primary cesarean delivery are not appreciated. However, repeat cesarean deliveries, in particular, carry significant risks and complications.

The most common indications for cesarean deliveries include breech presentation, twin pregnancies, prematurity, and labor complications. With the exception of breech presentation, the large increase in cesarean deliveries is not associated with any documented benefit for newborns. Apart from specific obstetric indications in the mother (eg, placenta previa or severe preeclampsia), the 33% cesarean delivery rate offers few proven maternal health benefits. Rather, there is considerable evidence that cesarean deliveries put women at increased risk for obstetric hemorrhage, infection, and deep vein thrombosis—the most frequent causes of severe maternal morbidity and the leading causes of hospital readmission in the first 30 days postpartum.^{3–6}

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Besides these short-term risks, significant long-term consequences for women's reproductive health are associated with cesarean delivery. They include pain and surgical adhesions as well as a possible increased risk for fertility issues and perinatal complications in subsequent pregnancies. The most serious risk for women undergoing multiple repeat cesarean deliveries is a step-wise, significant increased risk for life-threatening hemorrhage, severe morbidity, and hysterectomy resulting from placental implantation problems, in particular, placenta previa and placenta accreta.⁷

Some women prefer cesarean delivery or view it positively. For the majority of women, however, having a cesarean delivery (compared with giving birth vaginally) is associated with greater psychologic distress and illness, including postpartum anxiety, depression, and even posttraumatic stress disorder.^{8,9} In addition, cesarean deliveries can have an adverse influence on maternal–newborn contact at birth, women's satisfaction, and breastfeeding success.⁸

Beyond the health burden to mothers and newborns, the financial cost of cesarean deliveries is significant for women and their families as well as the state (Medicaid) and commercial insurers. Commercial hospital and physician reimbursement for a cesarean delivery is much higher than for vaginal birth—estimated at \$18,800 compared with \$11,500, respectively. The Pacific Business Group on Health estimates that the additional cesarean deliveries performed above the year 2000 baseline rate cost public and private payers in California at least \$240 million in 2011 alone. Furthermore, Pacific Business Group on Health estimates that between \$80 and \$441.5 million a year can be saved by reducing cesarean delivery rates in California alone with the amount of the savings dependent on the size of the reduction.¹⁰

Cesarean delivery rates vary widely among states, regions, hospitals, and health care providers, suggesting that medical factors alone do not explain and justify the increases seen in the last decade. Among California hospitals with more than 100 births per year, total cesarean delivery rates vary from 18% to 56% of all births; and rates of cesarean deliveries for low-risk first births (known as nulliparous, term, singleton, vertex) vary from 9% to 51% (Fig. 1). Two recent studies have found that the indications that account for over 60% of primary (first) cesarean deliveries are labor complications, including dystocia and failure to progress in labor and nonreassuring fetal heart rate.^{11,12} These indications also account for most of the rise in rates over the past decade and are also responsible for 80–90% of the variation in first-birth cesarean delivery rates among hospitals

and health care providers. Not surprisingly, these indications also have the least well-defined scientific evidence to support them.^{11,13,14}

The California Maternal Quality Care Collaborative analyzed variation among cesarean deliveries in California and found dramatic variations in nulliparous, term, singleton, and vertex cesarean delivery rates among regions and hospitals. California has similar payer contracts and liability laws statewide, so the large geographic variation suggests that local cultural factors may be at play.

A prior cesarean delivery is the single largest contributor to the rise in cesarean delivery rates among all indications. The majority of women with a prior cesarean delivery are good candidates to have their subsequent children by vaginal birth, yet despite the conclusion of a 2010 National Institutes of Health Consensus Development Conference panel that a trial of labor after cesarean delivery was a “reasonable option” for most women with a previous cesarean delivery, repeat cesarean delivery rather than vaginal birth has become common obstetric practice.¹⁵ Without a widespread increase in a trial of labor after cesarean delivery and the medical–legal policies that influence it, the percent of women in the United States having repeat cesarean deliveries will continue to rise as the primary cesarean delivery rate rises. This underscores the importance of reducing the first-birth cesarean delivery rate.

Popular accounts in the national media during the early and mid-2000s created the misleading impression that maternal request was a significant driver of the high cesarean delivery rate. However, little empirical evidence supports this explanation. A nationally representative survey conducted in 2006 (Listening to Mothers II) found that health care providers made the cesarean delivery decision more than twice as often as mothers under all conditions. In addition, at least one woman in four reported feeling pressure from a health care professional to have a cesarean delivery. Fewer than 1% of women reported choosing a nonmedically indicated cesarean delivery for their first birth.⁸

Because the rise in cesarean delivery rates cannot be explained by medical reasons, we reviewed the social science and health policy literature and conducted a series of qualitative interviews with obstetric clinicians to identify cultural and other factors influencing health care providers. The practice of defensive medicine is likely to be one reason for the high cesarean delivery rate. Obstetrician–gynecologists are among the medical specialties most likely to face a malpractice claim, and they have a higher risk of an indemnity payment exceeding \$1 million.¹⁶ The fear of



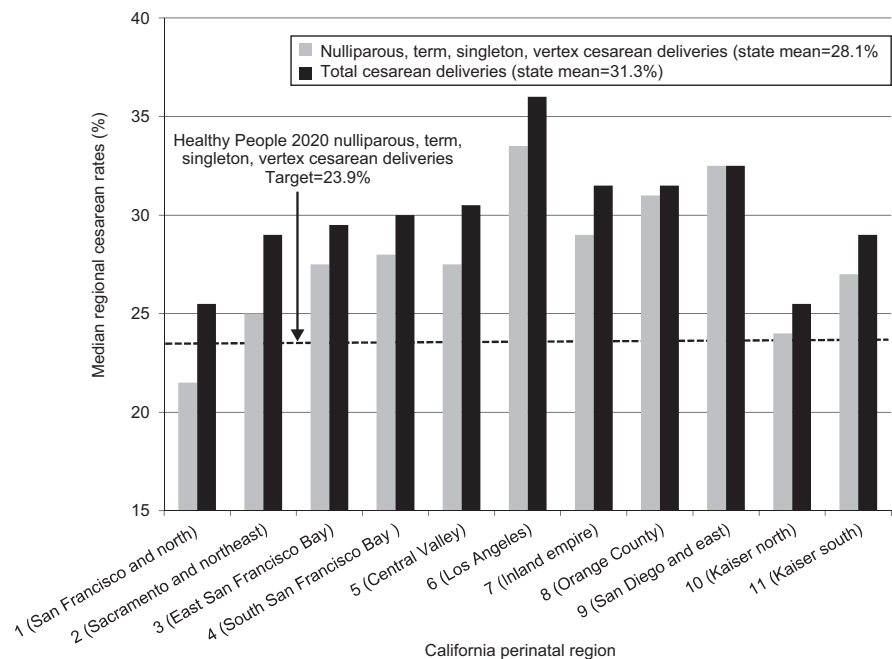


Fig. 1. Median hospital nulliparous, term, singleton, vertex cesarean rates (2007) for California perinatal regions (Source: All-California Rapid Cycle Maternal/Infant Database, California Maternal Quality Care Collaborative, 2011).

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malpractice litigation leads many physicians to have a lower tolerance for any perceived labor abnormality.

An important recurring theme in California Maternal Quality Care Collaborative's interviews was hospital and cultural factors (notably, those related to time efficiencies) that affect physician practice variation. Many nurses cited the competing demands on physicians for office appointments and for balance between work and home life, resulting in the multitasking physicians' impatience with labor progress. The use of inductions can create unreasonable expectations for a quick birth experience on the part of women and their families. There is now a better understanding that nulliparous labors are much slower than older literature would suggest and that "patience" is an important health care provider skill.¹⁷ This new "understanding" and best strategies to reduce the first-birth cesarean delivery rate were highlighted in a 2012 Workshop on Preventing the First Cesarean co-convened by the National Institute of Child Health and Human Development, Society of Maternal-Fetal Medicine, and the American College of Obstetricians and Gynecologists (the College).

Finally, misaligned or perverse economic incentives were described as significant barriers to reducing the cesarean delivery rate. For example, a significant portion of the obstetric global fee is delivery-based, creating incentives for obstetricians to attend their own patients when they are on call. This, in turn, increases the desire and pressure for physicians to schedule labor inductions during their call days. Misaligned incentives

have also led to the decline in vaginal births after cesarean deliveries. From a physician's perspective, a vaginal birth after a prior cesarean delivery is typically a long labor with increased risk exposure and less economic reimbursement than a repeat cesarean delivery. Not surprisingly, few physicians are strong advocates for supportive vaginal birth after cesarean delivery policies at their facilities or for vaginal birth after cesarean deliveries with their patients. Given current payment and malpractice policies, vaginal birth after cesarean delivery is often not a rational economic choice for either physicians or hospitals.

To reduce the rising cesarean delivery rate, a multistrategy approach is required; prior efforts indicate that no single strategy will have sustained effect. The most promising mix includes clinical quality improvement strategies with careful examination of labor management practices to reduce those that lead to the development of indications for cesarean deliveries; payment reform to eliminate negative or perverse incentives; health care provider and consumer education to recognize the value of normal vaginal birth; and full transparency through public reporting and continued public engagement.

Restoring the balance will not be an easy or quick proposition and will require coordinated efforts by multiple stakeholders. Clinical improvement strategies are more than just a matter of adopting and implementing practice guidelines. Improvements arise through tactics that include audit and feedback, education, and strong peer review among physicians. Incentives should



be used to motivate physicians and hospital administration, along with nursing staff, to engage together in changing the culture on labor and delivery units.

Hospitals should examine their care processes and consider appropriate quality improvement projects to reduce admissions in early labor, reduce elective inductions in first-time mothers, improve diagnostic and treatment approaches for labor complications, encourage vaginal birth after cesarean delivery through hospital policies and supportive care during labor, or all of these. Several groups in the United States are working to develop formal quality improvement toolkits with strategies such as these to support cesarean delivery reduction programs at the local, hospital system, and state levels.

What is an optimal target rate for an upper limit of cesarean deliveries as a percentage of all births? This question remains to be resolved. In 1985, the World Health Organization proposed a target for the total cesarean delivery rate for all countries of 15% arguing that there was no evidence of benefit above that level—a target that has not been adopted in the United States. A 2000 College report concluded that the most important group to focus on was women having their first labor and recommended using the nulliparous, term, singleton, vertex (low-risk, first-birth) cesarean delivery rate with a proposed target of 15.5%.¹⁸ The Healthy People 2020 objectives, which are more modest than their 2010 predecessor, call for a 23.9% nulliparous, term, singleton, vertex rate and for a doubling of the percentage of vaginal births after a prior cesarean delivery. The nulliparous, term, singleton, vertex cesarean delivery rate often falls 2–4 percentage points lower than the total cesarean delivery rate. Some hospitals and large geographic areas already meet the Healthy People 2020 targets, whereas others are quite far off.

The need for usable, validated quality measures in maternity care is rapidly gaining national attention; and the success of quality improvement efforts depends on the development, implementation, and tracking of such measures. Two foundational requirements for the success of a multistrategy initiative to improve maternal quality care and reduce cesarean delivery rates are recognition that change is necessary, desirable, and achievable and the availability of a reputable source for reliable, timely, and relevant quality data. Some hospitals are able to provide such data to drive internal professional and cultural change efforts, but many more are not; and in most cases, outcome data are not publicly reported in sufficient detail or in a timely way. A California maternal data center with the capacity to provide a robust source of near-real-time outcome data for large-scale maternity

quality improvement projects has been created through collaboration between California Maternal Quality Care Collaborative and state and federal agencies and other stakeholders. Washington state and Louisiana have similar projects underway.

Financial incentive strategies can redirect clinical practices to change the cesarean delivery rate trajectory. Given the budget issues faced by all payers (Medicaid and commercial) and the considerable dollars at stake, reforming payment for cesarean deliveries is likely to be a priority for policymakers and payers. Payment reform could create the proverbial “burning platform” that spurs change more quickly than other strategies. The first step is to remove the perverse financial incentives that currently help drive the rising rate.

Payment schemes can be used to reward providers for high-quality clinical practice and good patient outcomes, to encourage specific practices (eg, vaginal birth after cesarean delivery) or discourage others (eg, labor induction with an unfavorable cervix or repeat cesarean deliveries), or both. Nonpayment for “unapproved” services is quite controversial, because there can be justifications for some individual cases. However, payment can be linked to overall health care provider and hospital performance. A good example is the Value Based Purchasing program currently being implemented nationally for selected outcomes for Medicare patients. Another approach gaining significant interest is bundled or blended payments. An example of such a program is a single payment to a hospital for a “birth” that is a blend of vaginal and cesarean delivery rates. Importantly, this approach keeps the quality improvement activity local to the hospital rather than having decisions for medical care driven by government, insurance payers, or other stakeholder groups. Appropriate balancing measures documenting newborn outcomes are needed for this approach.

Despite the abundance of reputable online sites for information on pregnancy and childbirth, most women enter the hospital with little knowledge of common procedures, their indications, and risks. Indeed, the rate of prenatal education program attendance has declined in the United States.⁸ Clinicians and other important stakeholders, including payers, purchasers, and public health officials, need education on the disconnect between dollars spent and outcomes achieved in U.S. maternity care.

A coordinated effort by many organizations and individuals is needed to address these information and awareness gaps not only about the bigger picture, but also about specific ways that the cesarean delivery rate can be lowered through the strategies outlined here.



The endorsement and adoption of the nulliparous, term, singleton, vertex measure for cesarean delivery by the National Quality Forum and The Joint Commission has raised clinical awareness of the importance of first labor management. Educational efforts, although necessary, are not sufficient to ensure lower cesarean delivery rates.

The College's revised policy on vaginal birth after a prior cesarean delivery¹⁹ is a positive step together with the strong scientific evidence for the National Institutes of Health recommendation that most women who are good candidates should be counseled about vaginal birth after cesarean delivery and offered a trial of labor.¹⁵ Nevertheless, it likely will take persistent pressure from childbearing women and advocates for evidence-based practice in childbirth, changes in medical liability laws giving protection for following established guidelines ("safe harbors"), supported by public reporting of a trial of labor after a cesarean delivery and vaginal birth after cesarean delivery availability at the hospital level, to reverse the current trend and make vaginal birth after a prior cesarean delivery more widely available.

Public reporting can aid consumer health care decision-making and incent or pressure health care providers to improve their performance. The experience of states such as Virginia indicates that public online reporting of hospital and physician cesarean delivery rates is not sufficient to stabilize or reduce the cesarean delivery rate. However, public reporting and transparency remain an important strategy when combined with other efforts including payment reform, education, and advocacy for practices that support vaginal birth. These recommendations have been presented in greater detail in the California Maternal Quality Care Collaborative White Paper at www.cmqqc.org/white_paper.¹⁰

We recommend that the multiple approaches described in this article, or as many as possible of them, be undertaken simultaneously, as appropriate to the local context. Many of these interventions interact positively with and reinforce each other. In this era of searching for value and improving quality in the U.S. health care system, the significant increase and variation in cesarean delivery rates should command national attention. The multistrategy approach advocated here must engage all relevant stakeholders and focus equally on the medical and cultural factors responsible for the rising cesarean delivery rate. In so doing, maternal health outcomes will improve.

REFERENCES

1. MacDorman MF, Menacker F, Declercq E. Cesarean birth in the United States: epidemiology, trends, and outcomes. *Clin Perinatol* 2008;35:293–307, v.
2. The Joint Commission. Specifications manual for Joint Commission national quality measures (v2011A): PC-02 NTSV cesarean section. 2011. Available at: <http://manual.jointcommission.org/releases/TJC2011A/MIF0167.html>. Retrieved September 19, 2011.
3. Callaghan WM, Mackay AP, Berg CJ. Identification of severe maternal morbidity during delivery hospitalizations, United States, 1991–2003. *Am J Obstet Gynecol* 2008;199:133.e1–8.
4. Declercq E, Barger M, Cabral HJ, Evans SR, Kotelchuck M, Simon C, et al. Maternal outcomes associated with planned primary cesarean births compared with planned vaginal births. *Obstet Gynecol* 2007;109:669–77.
5. Liu S, Liston RM, Joseph KS, Heaman M, Sauve R, Kramer MS; Maternal Health Study Group of the Canadian Perinatal Surveillance System. Maternal mortality and severe morbidity associated with low-risk planned cesarean delivery versus planned vaginal delivery at term. *CMAJ* 2007;176:455–60.
6. Liu S, Heaman M, Joseph K, Liston RM, Huang L, Sauve R, et al. Risk of maternal postpartum readmission associated with mode of delivery. *Obstet Gynecol* 2005;105:836–42.
7. Silver RM. Delivery after previous cesarean: long-term maternal outcomes. *Semin Perinatol* 2010;34:258–66.
8. Declercq ER, Sakala C, Corry MP, Applebaum S. Listening to mothers II: Report of the second national US survey of women's childbearing experiences. New York (NY): Childbirth Connection; 2006.
9. Lobel M, deLuca R. Psychosocial sequelae of cesarean delivery: Review and analysis of their causes and implications. *Soc Sci Med* 2007;64:2272–84.
10. Main E, Morton C, Hopkins D, Giuliani G, Melsop K, Gould J. Cesarean deliveries, outcomes, and opportunities for change in California: toward a public agenda for maternity care safety and quality. Palo Alto (CA): California Maternal Quality Care Collaborative; 2011. Available at: www.cmqqc.org/white_paper. Retrieved December 12, 2011.
11. Barber EL, Lundsberg LS, Belanger K, Pettker CM, Funai EF, Illuzzi JL. Indications contributing to the increasing cesarean delivery rate. *Obstet Gynecol* 2011;118:29–38.
12. Getahun D, Strickland D, Lawrence JM, Fassett MJ, Koebnick C, Jacobsen SJ. Racial and ethnic disparities in the trends in primary cesarean delivery based on indications. *Am J Obstet Gynecol* 2009;201:422.e1–7.
13. Penn Z, Ghaem-Maghami S. Indications for cesarean section. *Best Pract Res Clin Obstet Gynaecol* 2001;15:1–15.
14. Zhang J, Troendle J, Reddy UM, Laughon SK, Branch DW, Burkman R, et al. Contemporary cesarean delivery practice in the United States. *Am J Obstet Gynecol* 2010;203:326.e1–326.e10.
15. National Institutes of Health Consensus Development Conference Panel. National Institutes of Health Consensus Development conference statement: vaginal birth after cesarean: new insights March 8–10, 2010. *Obstet Gynecol* 2010;115:1279–95.
16. Jena AB, Seabury S, Lakdawalla D, Chandra A. Malpractice risk according to physician specialty. *N Engl J Med* 2011;365:629–36.
17. Laughon SK BD, Beaver J, Zhang J. Changes in labor patterns over 50 years. *Am J Obstet Gynecol* 2012;206:419.e1–9.
18. American College of Obstetricians and Gynecologists. Evaluation of cesarean delivery. Available at: www.acog.org/Resources_And_Publications/Task_Force_and_Work_Group_Reports_List. Retrieved August 9, 2012.
19. Vaginal birth after previous cesarean delivery. Practice Bulletin No. 115. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2010;116:450–63.

