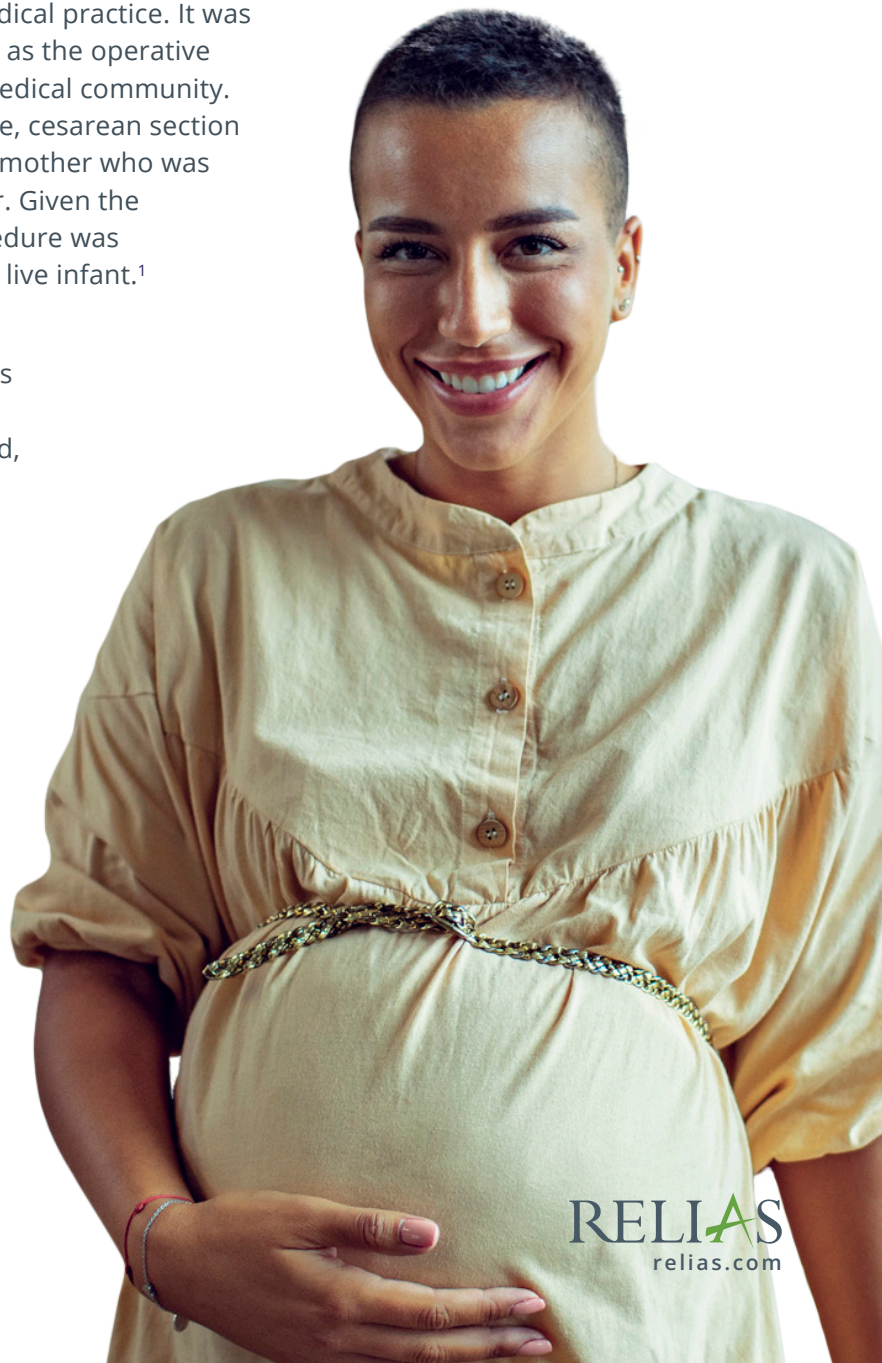


Promoting Vaginal Birth

A Guide to Understand and Lower the Cesarean Birth Rate

The historical record is replete with descriptions of a surgical procedure involving delivery of the fetus through an abdominal incision of the pregnant woman. These initial stories describing birth through the maternal abdomen, were performed in exceptional circumstances, outside the scope of existing medical practice. It was not until the 19th century that cesarean section, as the operative procedure is now known, was adopted by the medical community. When initially introduced into obstetrical practice, cesarean section was undertaken to save the life of the pregnant mother who was suffering from complications of protracted labor. Given the substantial operative risks at the time, the procedure was one of last resort and was rarely productive of a live infant.¹

With advances in surgical and aseptic techniques during the late 19th and early 20th century, the operative risks of cesarean section were reduced, promoting a reassessment of the procedure. It became apparent that maternal outcomes could be improved with earlier performance of cesarean. In the early and mid- 1900s, evolution of the concept of the fetus as a person led to the introduction of cesarean delivery for fetal reasons, most typically to avoid birth injury. Technological and obstetrical advances between 1960–70 allowed assessment of the fetal condition in labor. The ability to assess fetal “wellbeing” during labor, and to monitor the fetal response to the intrapartum stresses of labor through changes in the fetal heart rate tracing, led to a broadening of the fetal indications for cesarean section to include “fetal distress in labor.”





During the latter half of the 20th century, the frequency of cesarean birth had risen dramatically worldwide. In the United States, the cesarean birth rate increased from 5.5% in 1970, to 22.7% by 1985. Prompted by the rise in cesarean births, the National Institute of Health (NIH) convened a consensus development conference on cesarean childbirth in 1980.² Efforts to reduce cesarean births led participants to reevaluate the time-honored obstetrical dictum, “once a cesarean, always a cesarean,” and patients with a prior cesarean section were encouraged to attempt a trial of labor. Increasing adoption of trial of labor after cesarean (TOLAC) followed, leading to temporary stabilization of the overall cesarean birth rate in the United States. However, by the mid-1990s, physicians and patient acceptance of TOLAC began to wane. Furthermore, the rate of primary cesarean birth that had been stable throughout much of the 1990s began to rise late in the decade. Both contributed to a rising cesarean birth rate in the United States, which peaked at nearly one third of all births in 2009.

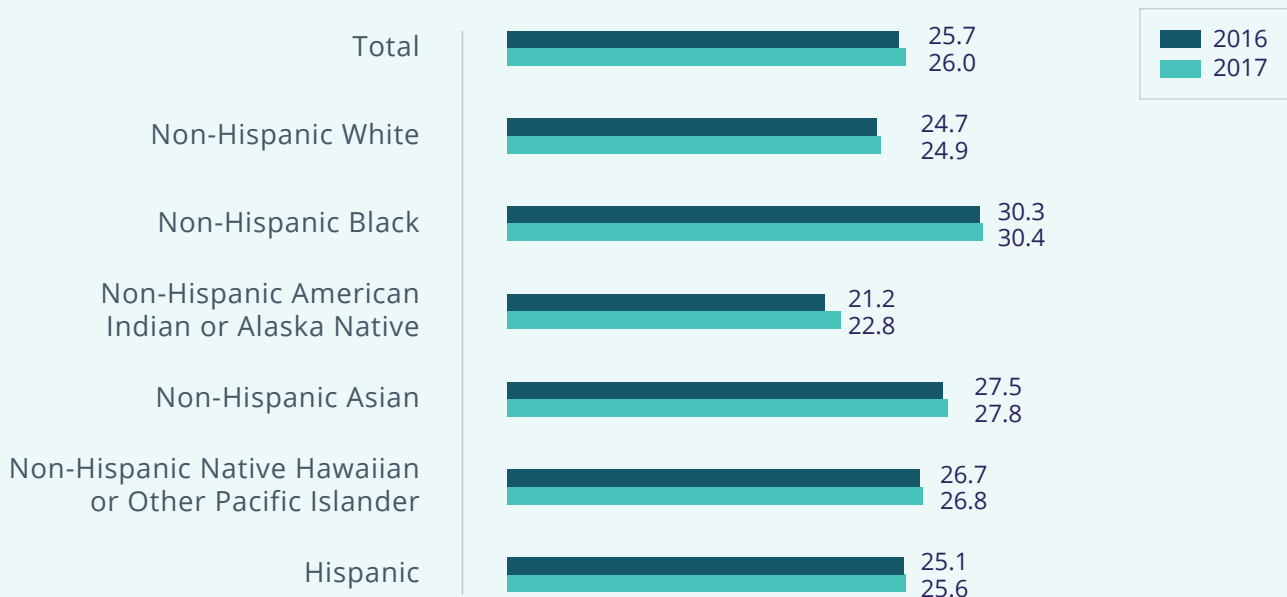
The most recent rise in cesarean births has brought renewed attention to the situation, and has prompted much discussion around the appropriate use of cesarean in clinical practice. The renewed focus has borne fruit; the cesarean birth rate has stabilized over the past five years. Still, in 2015, when the World Health Organization (WHO) proposed an updated target worldwide cesarean birth rate of 19%,³ the United States cesarean birth rate was 32%, 40% higher than 1985. Clearly, more is required. Any effort to reduce cesarean birth rates requires knowledge of the population served and an appreciation of those factors associated with a higher likelihood for cesarean birth. Empowered with an individualized assessment of cesarean birth rate and knowledge of contributors to this rate, implementation of clinical strategies targeting the key drivers of the cesarean birth rate provides the best opportunity for promoting vaginal and reducing cesarean births.

Why the Focus on Cesarean Birth Rates?

With few exceptions, vaginal birth is less costly and associated with fewer complications compared to cesarean birth. Patients experiencing a vaginal birth have a shorter hospital length of stay and lower hospital costs. Patients experiencing vaginal birth recover more quickly, require fewer medical and hospital resources, can be safely discharged from the hospital after one to two days, and post discharge, can resume their normal activities sooner compared with cesarean birth.

In addition to higher maternal costs, newborn costs are higher for infants delivered by cesarean versus vaginally. The majority of these incremental costs are related to neonatal intensive care unit (NICU) admission and treatment for acute respiratory morbidities.

LOW-RISK CESAREAN DELIVERY, BY RACE AND HISPANIC ORIGIN: UNITED STATES, FINAL 2016 AND PROVISIONAL 2017



Cesarean Birth Risks

Cesarean birth is associated with higher long-term costs including medical costs related to treatment of abdominal pain and complications from pelvic adhesions compared to vaginal birth. Medical costs for treatment of infertility and ectopic pregnancy, both seen more frequently following cesarean versus vaginal birth, are higher and may complicate future childbearing.

MATERNAL RISKS

CESAREAN VS. VAGINAL BIRTH

Cesarean

- + Anesthesia complications
- + Bladder, bowel, vascular injury
- + Infection
- + Wound complications
- + Delayed breastfeeding
- + Recovery time
- + Greater blood loss
- + Venous thromboembolism (VTE)
- + Postpartum pain
- + Adhesion-related complications
- + Need for additional operative procedures

Vaginal

- + Perineal trauma, pain
- + Urinary incontinence
- + Uterovaginal prolapse

In subsequent pregnancies, most patients previously delivered by cesarean will opt for repeat cesarean birth. With each successive cesarean birth, patients are increasingly more likely to encounter placental, obstetrical, and operative complications. The medical costs and hospital length of stay are higher for these complicated cesarean births.⁴

The likelihood for complications, for both mother and infant, are higher for cesarean versus vaginal births. Cesarean birth is associated with a higher risk for all of the following: anesthesia complications, obstetrical hemorrhage, thromboembolism, endometritis, wound complications, bowel/bladder/vascular injury, additional surgical interventions, and abdominal pain.

Neonatal complications associated with cesarean birth include superficial laceration injuries, higher rate of respiratory morbidities, and greater need for NICU admission. Maternal risks from vaginal delivery include perineal trauma/pain and genitourinary complications; birth trauma is the principle neonatal risk.⁵



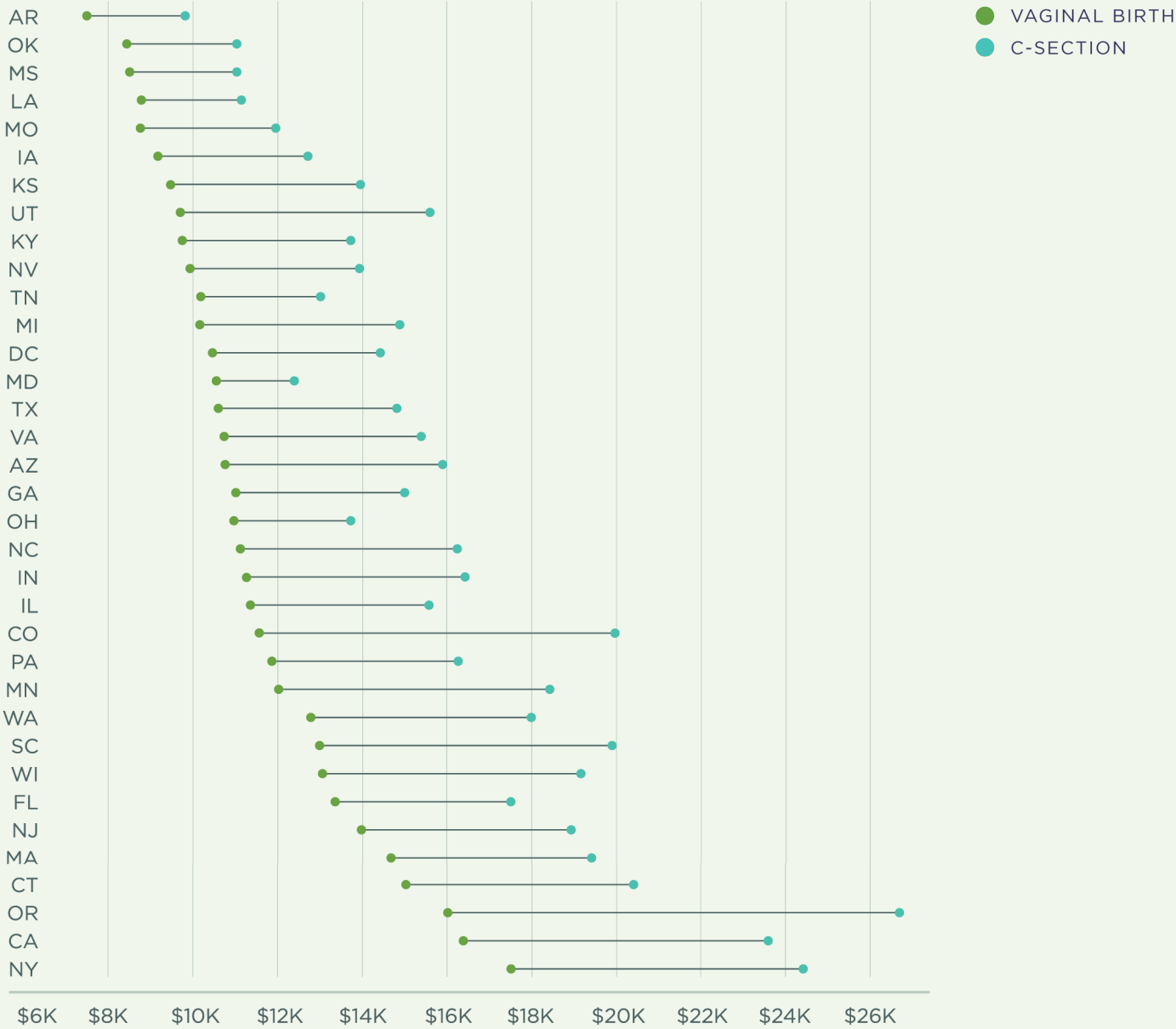
Factors Impacting Vaginal Birth Rates

Cesarean birth rates vary greatly around the world, ranging from a low of under 10% of deliveries to rates approaching 50% of births. In developed nations, where access to safe cesarean is widely available and patients are more accepting of this delivery option, cesarean birth rates are higher. Cesarean birth may be pursued due to maternal fear of vaginal delivery, for the scheduling convenience of the mother or provider, the ability to choose a specific delivery day, and belief that cesarean birth is a more advanced delivery method.

Access to safe cesarean section has been widely available across the United States for decades; yet, the cesarean birth rates in the United States have risen significantly since 1970 when the cesarean birth rate was 5%. Cesarean birth rates increased markedly through the 70s and 80s, rising to nearly 25% of all births before the rate stabilized during the early 1990s. The overall cesarean delivery rate increased to 32% in 2017, compared to 31.9% in 2016. The rate had declined for four years in a row (2013-2016), after peaking at 32.9% in 2009.⁶ In attempting to understand reasons behind this most recent rise, three factors known to be associated with a higher risk for cesarean birth—maternal obesity, multiple gestation rate, and rate of labor induction—have all risen in parallel to cesarean birth rate and are likely contributors.

Since 1990, the rate of obesity in the adult United States population has increased nearly threefold to 37.7% in 2015.⁷ The increased use of artificial reproductive technologies (ART) has resulted in a significant rise in multiple gestation births. With a higher rate of obesity and multiple gestation in the population, a higher cesarean birth rate is expected. Since 1990, labor induction rates in the United States have increased more than twofold, from 9.6% in 1990, to 23.8% in 2010.⁸ Overuse of labor induction has been associated with a higher likelihood for cesarean birth and is associated with longer hospital stays and higher costs compared with spontaneous labor.

Total Spending per Vaginal Birth Versus C-Section by State



Source: Health Care Cost Institute, 2016-2017

“Ambulation and repositioning during the first and second stages of labor may promote uterine contractility, encourage proper fetal positioning, and enhance the prospects for vaginal birth.”

Differences in cesarean birth rates among providers in a single institution with similar patient populations brings into question the contribution played by differences in clinical practice. Cesarean for labor disorder and fetal heart rate (FHR) tracing abnormalities are the most common indicators of cesarean section, and clinical management variations of these disorders may account for differences in cesarean birth rates among providers. Standardization of labor and FHR management has the potential to address unnecessary clinical variations in management and may allow more patients to labor and deliver vaginally. Providers who utilize operative vaginal delivery, perform external cephalic version of the breech fetus, are skilled in twin vaginal birth, and who work within institutions supporting TOLAC, provide more patients the opportunity for a vaginal birth compared to providers lacking this clinical expertise. Spread and adoption of these clinical practices will make vaginal birth an option for more women.



Emphasis on Vaginal Delivery

Prenatal education provides the opportunity to address maternal concerns, educate the patient about the normal conduct of labor, and familiarize the patient with the workings of the delivery ward. Patients should be encouraged to develop a personalized birth plan and to share and review the plan with their provider. Women who receive prenatal education and who are engaged in planning for their birth are more likely to deliver vaginally.⁶ With a better understanding for the normal progress of labor and bolstered with techniques for pain management, low-risk parturients can be more confident in managing the early stages of labor at home which may lead to fewer intrapartum interventions.⁹

Continuous support during labor, provided by family members, friends, nurses, or doulas, can enhance the parturient's birth experience, reduce intrapartum interventions and increase her chance for vaginal birth.¹⁰ Shared knowledge among the delivery room providers of the patient's preferences laid forth in her birth plan, and adherence to common labor management protocols, will help minimize deviations in clinical care. Ongoing, effective communication between patient, her support group and obstetrical care providers—a hallmark of highly reliable teams—is essential throughout labor, and more critically, when complications arise.



“Women who **receive prenatal education** and who are engaged in **planning for their birth** are more likely to deliver vaginally.”



A myriad of options for helping patients manage the pain of labor exist. Patients are best served, and their labor experienced enhanced, when access to a broad range of pain control options, both nonpharmacological and pharmacological, is available. Relaxation techniques, meditation, massage, acupuncture and hypnotherapy are effective techniques for stress and pain management during labor. Hydrotherapy, in the form of shower or water immersion in a tub has also proven beneficial for pain management during the first stage of labor.

Encouraging freedom of movement of the patient during labor can also assist in managing the pain and stress of labor. Ambulation and repositioning during the first and second stages of labor may promote uterine contractility, encourage proper fetal positioning, and enhance the prospects for vaginal birth.¹¹ Where appropriate and requested, pharmacologic therapies, ranging from self-administered nitrous oxide to regional anesthesia can prove invaluable to the laboring patient.



Exploring the Role of Induction

With the advent of more effective methods for cervical ripening, and evidence for higher vaginal delivery rates in patients induced at 41 weeks versus those expectantly managed,¹² providers and patients increasingly pursued induction of labor. Between 1990 and 2010, the percentage of induced labors increased markedly from 9.6% to 23.8%, a rise paralleling that of cesarean births during the same time period. Since 2009, labor induction rates have stabilized, in large part due to national efforts targeting elective delivery prior to 39 weeks. Still, more than one in four pregnancies in the United States will be induced.¹³

Between 1990 and 2010, the percentage of induced labors increased markedly from 9.6% to 23.8%, a rise paralleling that of cesarean births during the same time period.

When induction of labor is undertaken, the ultimate goal is vaginal birth. Induction of labor is indicated when the risks of ongoing pregnancy are greater than the risks of induced delivery. Labor induction in the absence of a medical, obstetrical, or fetal indication is elective and should be pursued only in circumstances where vaginal delivery is highly probable. Factors associated with a higher risk for failed induction include maternal parity, gestational age, and cervical status.¹⁴ Compared with spontaneous labor, healthcare costs are increased with labor induction. Given the known incremental healthcare costs and the potential for failed induction leading to cesarean birth, elective labor induction is discouraged.

When labor induction is pursued, variations in clinical protocols and management can influence the duration, and ultimately the success of the procedure. Multiple options for cervical ripening exist, both mechanical and pharmacologic. The duration of labor may be shortened by adopting a simultaneous induction protocol (mechanical ripening and oxytocin) over a sequential approach (cervical ripening followed by oxytocin). Differences in clinical management—duration of oxytocin, utilization and timing of amniotomy, and definition of failed induction—may account for disparate induction outcomes and vaginal birth rates.



Unplanned Cesarean Birth

The majority of unplanned cesarean births are performed for intrapartum labor or fetal heart rate (FHR) pattern abnormalities. Both disorders are commonly encountered in the labor suite and both are subject to diagnostic imprecision and variations in clinical management that can contribute to differences in cesarean birth rates amongst providers and institutions. Analysis of contemporary labor patterns has prompted a reassessment of long-accepted definitions for labor abnormalities. The diagnostic criterion for prolonged disorder of latent phase, onset of the active phase of labor, and first and second stage labor disorders have been modified in the hopes that with widespread adoption and consistent application of these revised definitions, women will be permitted to safely labor longer than has been traditionally allowed and achieve the goal of vaginal birth.¹⁵

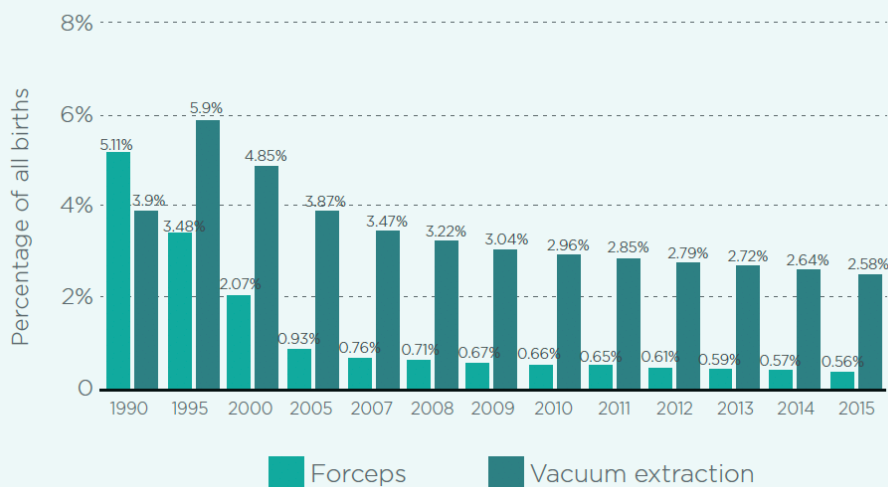
“Widespread use of intrapartum FHR monitoring, absent standardization of interpretation, leads to predictable results—higher rates of cesarean birth with little evidence of clinical benefit.”

Continuous FHR has been standard practice in most US labor and delivery units since the 1980s despite a lack of standardization in nomenclature, interpretation, and management for the abnormal intrapartum FHR pattern. Widespread use of intrapartum FHR monitoring, absent standardization of interpretation, leads to predictable results—higher rates of cesarean birth with little evidence of clinical benefit. In 2008, building on the foundational work around FHR nomenclature from the 1990s, a joint workshop was convened by the National Institute of Child Health and Human Development (NICHD), The American College of Obstetricians and Gynecologists (ACOG), and the Society for Maternal-Fetal Medicine (SMFM), to review and standardize definitions of FHR characteristics and patterns with the goal of improving communication among providers. A three-tiered diagnostic framework along with clinical recommendations were proposed in an effort to encourage the development of evidence-based management guidelines.¹⁶ Additional FHR management guidelines have followed, with the purpose of standardizing the clinical management of intrapartum FHR tracing abnormalities, to identify those patients requiring immediate delivery—by cesarean if remote from vaginal delivery—from those who can safely be allowed to continue labor, increasing the patient’s prospects for vaginal birth.

Increasing Access to Vaginal Birth

Increased utilization of external cephalic and vaginal delivery of twins can provide patients, who would otherwise require delivery by cesarean, the option of vaginal birth. For the singleton pregnancy with a fetus in the breech presentation at 37 weeks, external cephalic version has high success rates in converting to vertex presentation, and provides the opportunity for the patient to pursue vaginal birth. For the 40% of twin pairs that present as vertex-vertex, the majority can be safely delivered vaginally. In vertex, non-vertex twin pairs delivered by experienced clinicians trained in advanced obstetrical techniques to manage the non-vertex second twin, vaginal delivery of both twins can be safely achieved in more than 50% of cases.

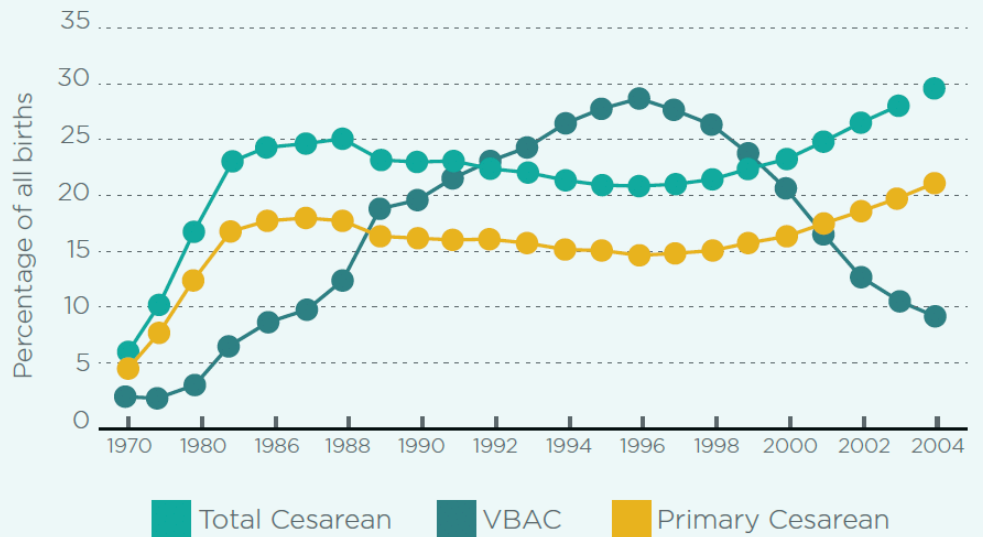
PERCENTAGE OF BIRTHS DELIVERED BY FORCEPS OR VACUUM EXTRACTION IN THE UNITED STATES FROM 1990 TO 2015



SOURCE: CDC © STATISTA 2018
 ADDITION INFORMATION: UNITED STATES: CDC; NCHS (NVSS)

Operative vaginal delivery (OVD), by forceps or vacuum, is an important skill for the obstetrician to possess and affords selective patients with an option to cesarean birth. Unfortunately, over the past 25 years the OVD rate has decreased by two thirds, from 9% to 3% of deliveries in the United States.¹⁷ When clinically appropriate and skillfully performed, OVD remains a safe and effective alternative to cesarean birth.

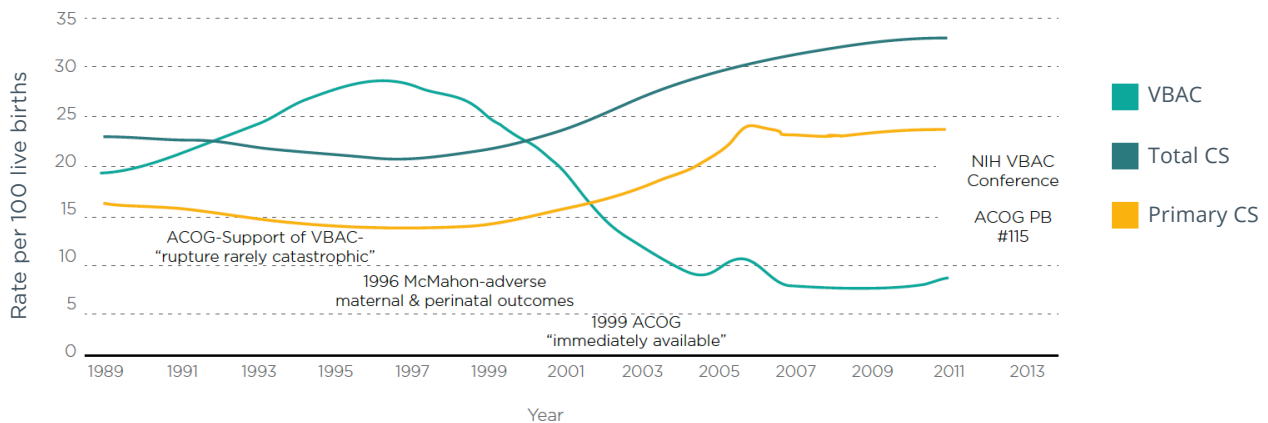
CESAREAN AND VAGINAL BIRTH AFTER CESAREAN (VBAC) DELIVERY RATES 1970-2004



SOURCE: CDC © STATISTA 2018
 ADDITION INFORMATION: UNITED STATES: CDC; NCHS (NVSS)

Owed to the obstetrical dictum, “once a cesarean, always a cesarean,” vaginal birth after a previous cesarean delivery was uncommon in the United States prior to 1980. Prompted by a rising cesarean birth rate, this maxim was challenged, opening the way for vaginal birth after cesarean section into clinical practice.¹⁸ By the end of the 1980s, the rate of VBAC had risen from 3% in 1981, to over 20% in 1989. By the mid-1990s, a trial of labor after cesarean (TOLAC) was accepted practice for the women with one prior, low transverse cesarean when the VBAC rate peaked at 28.3% of births in 1996.¹⁹ With increased utilization of VBAC, the overall cesarean birth rate decreased; however, enthusiasm was tempered by multiple reports of intrapartum fetal deaths due to uterine rupture in patients undergoing a TOLAC. Fearful of these risks, patients and providers turned away from TOLAC. By 2004, the VBAC had fallen below 10%.¹⁹

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Only recently have more patients and providers cautiously pursued the benefits of TOLAC, accounting for 11.9% of United States births in 2015.²⁰ Cognizant of the risks, TOLAC is best performed in a TOLAC-capable obstetrical unit and only for well selected patients. TOLAC should only be attempted by providers experienced in TOLAC management and its complications, and only in birth facilities with the necessary inhouse clinical support needed to perform an emergent cesarean delivery. Best candidates for TOLAC include patients with a prior vaginal birth and those with a prior cesarean for nonrecurring reasons, for example, malpresentation or abnormal FHR tracing. The prospects for a safe, successful vaginal birth are enhanced when appropriately selected TOLAC patients are managed in obstetrical units with the requisite clinical support and expertise.²¹



Summary

The origins of the rising cesarean birth rate are complex and include cultural, maternal, obstetrical, and clinical influences.²² Knowledge of factors that affect cesarean birth rates is essential when attempting to understand the relative contribution of each to one's individual rate. A detailed self-analysis of obstetric clinical practices can help in highlighting and prioritizing improvement opportunities. Implementation of focused clinical strategies targeting key drivers provides the best opportunity to reduce avoidable cesarean through the promotion of vaginal birth.



HOW RELIAS CAN HELP

Relias is a leader in obstetrical patient safety.

Due to the increasing number of cesarean births with the associated risks to both mothers and babies when not medically necessary, hospitals need effective strategies to promote vaginal birth and maintain cesarean birth rates at targeted levels. Across states and within any hospital or health system, there is a wide variation of cesarean birth rates. Relias helps hospitals identify and reduce variation in care and improve patient safety with analytics, provider and nurse assessments, and evidence-based education tailored to the individual.

Relias helps hospitals reduce unintended variation in care.

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