

THE C-SECTION EPIDEMIC: WHAT'S TORT REFORM GOT TO DO WITH IT?

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Today, one in three babies in the United States comes into the world by cesarean section. The cesarean section has become the most commonly performed operating room procedure in the United States. Conventional wisdom holds that malpractice liability bears primary responsibility for the cesarean-section epidemic and that tort reform, which caps physician liability, holds the key to its reduction. This Article presents new aggregate empirical data that debunks this view. For the first time, it provides a national cesarean rate for births subject to damage caps and a national cesarean rate for births without damage caps. This data shows that a woman is not less likely to give birth by cesarean section in a state with damage caps than in one without. Thus, either damage caps are insufficient to address physicians' concerns or other explanations better account for the overuse of the procedure. The empirical analysis will assist policy-makers and advocates seeking to reduce the cesarean rate as well as contribute to consideration of the efficacy of medical malpractice reform as a means to reduce the broader problem of medical overtreatment.

The Article then outlines three policy initiatives to reduce the cesarean-section rate. First, it suggests upending the current payment practice for deliveries. Contrary to the present norm, it proposes that obstetricians receive more, rather than less, to deliver vaginally to compensate them for the extra time that vaginal delivery takes compared to cesarean delivery. Second, rather than looking to tort reform to reduce cesarean-section rates, the Article explores whether malpractice insurance providers themselves are contributing to the cesarean-section epidemic and advocates for two novel medical malpractice insurance reforms to address this problem. Third, it advocates for public disclosure of hospital and physician cesarean-section rates so that women can make informed decisions when selecting their healthcare providers and when determining whether to have a cesarean section.

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I. INTRODUCTION

When I was in law school, not a single woman student was pregnant. Today, many of my students are expecting, and part of being a female law professor involves attending baby showers and counseling students on balancing work and parenthood. What few of my excited and healthy expecting students realize is that a high percentage of them will give birth surgically—by cesarean section.

The cesarean section (“C-section”) is the most commonly performed operating room procedure in the United States.¹ Under this procedure, rather than delivering a baby through the vaginal canal, physicians open the mother’s abdomen and slice through muscle, tissue, and the uterine wall to remove the baby.² Between 1997 and 2007, the C-section rate in the United States jumped by over

1. K. LEVIT ET AL., AGENCY FOR HEALTHCARE RESEARCH & QUALITY, HCUP FACTS AND FIGURES: STATISTICS ON HOSPITAL-BASED CARE IN THE UNITED STATES, 2007 3 (2009), https://www.hcup-us.ahrq.gov/reports/factsandfigures/2007/pdfs/FF_report_2007.pdf [hereinafter AHRQ REPORT].

2. THERESA MORRIS, CUT IT OUT: THE C-SECTION EPIDEMIC IN AMERICA 5–6 (N.Y. University Press 2013).

fifty percent.³ Today, about one in three babies in the United States comes into the world by cesarean section.⁴

While C-sections are necessary, and even life-saving, for mother and child in certain situations such as preeclampsia, cord prolapse, and breech presentation, the C-section rate in the United States far exceeds the World Health Organization's recommended rate of 5-10%.⁵ According to the World Health Organization ("WHO"), "[n]o justification" exists "for any region to have C-section rates higher than 10-15%."⁶ Indeed, C-section rates above 15% appear to do more harm than good both for mothers and babies.⁷

Women experience a three to four times higher mortality (death) rate and a twenty times greater morbidity (injury) rate when delivering by C-section rather than vaginally.⁸ Women who delivered by C-section risk future infertility, serious problems with future pregnancy, infection and pain from scarring, and have less contact with their babies after birth.⁹ Babies born by C-section experience greater breathing problems and infections than do children born vaginally.¹⁰ They are less likely to breast feed and more often suffer from asthma as children.¹¹

Perhaps these harms would be justified if they resulted in healthier babies. They do not. While our national C-section rate has soared, APGAR scores,

3. AHRQ REPORT, *supra* note 1.

4. CDC Statistics for 2013 report a national C-section rate of 32.7%. JOYCE A. MARTIN ET AL., U.S. DEP'T OF HEALTH & HUM. SERVS., CTRS. FOR DISEASE CONTROL, BIRTHS: FINAL DATA FOR 2013 1 (2015), https://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_01.pdf; *Total Cesarean Deliveries: United States, 2014*, MARCH OF DIMES, <http://www.marchofdimes.org/peristats/ViewSubtopic.aspx?reg=99&top=8&stop=86&lev=1&slev=1&obj=9&dv=ms> (last visited Jan. 15, 2018).

5. *Why Does the Cesarean Section Rate Keep Going Up?*, CHILDBIRTH CONNECTION, <https://pqnc-documents.s3.amazonaws.com/sivbdoc/sivbeb/7ChildbirthConnectionReasonsforCesareanRateIncrease.pdf> (last visited Jan. 15, 2017).

6. World Health Organization, *Appropriate Technology for Birth*, 326 LANCET 436, 436-37 (1985).

7. Fernando Althabe & Jose M. Belizan, *Caesarean Section: The Paradox*, 368 LANCET 1472, 1472-73 (2006).

8. GARY NULL, DEATH BY MEDICINE 25 (2011). The American College of Obstetrics and Gynecology released the results of a study that found cesarean delivery to "significantly" increase the risk of maternal death to 35.9 deaths per 100,000 from 9.2 deaths per 100,000 for vaginal deliveries. Michael J. Myers, *ACOG's Vaginal Birth After Cesarean Standard: A Market Restraint Without Remedy?*, 49 S.D. L. REV. 526, 527 (2004). Two well-designed overseas studies show the dangers of C-sections. Catherine Deneux-Tharaux et al., *Postpartum Maternal Mortality and Cesarean Delivery*, 108 OBSTETRICS & GYNECOLOGY 541, 544 (2006) (reporting a French study finding that women were 3.3 to 3.6 more likely to die during a C-section than during a vaginal birth. This was true whether the C-section was planned or unplanned. The researchers removed from the study women with risk factors that predisposed them to having a C-section or complications from a C-section); Jose Villar et al., *Maternal and Neonatal Individual Risks and Benefits Associated with Cesarean Delivery: Multi-centre Prospective Study*, 335 BRITISH MED. J. 1025 (2007) (reporting a World Health Organization-supported study of births in Latin America that showed that planned C-sections were associated with higher rates of maternal death and injury and fetal death than were planned vaginal births, taking into account hospital setting and any maternal risk factors).

9. *Repair of C-Section Scars Causing Secondary Infertility*, REPRODUCTIVE SCI. CTR., <https://bayareafertilitydoctor.com/treatment-options/repair-c-section-scars-infertility/> (last visited Jan. 2, 2018).

10. Myers, *supra* note 8, at 534.

11. Amy J. Hobbs et al., *The Impact of Cesarean Section on Breastfeeding Initiation, Duration and Difficulties in the First Four Months Postpartum*, 16 BIOMED CENT. PREGNANCY & CHILDBIRTH 90 (2016); Anne Ringgaard, *Giant Study Links C-Sections with Chronic Disorders*, SCIENCE NORDIC (2014); Denise Grady, *Majority of Caesareans are Done Before Labor*, N.Y. TIMES, August 31, 2010, at D7.

which measure newborn health, have not improved, nor have we enjoyed a decrease in newborn mortality or morbidity.¹² Rates of cerebral palsy and shoulder dystocia among children, two of the conditions that C-sections most seek to avoid, have remained steady despite the increased resort to C-sections.¹³ Hospitals with high C-section rates experience no better neonatal outcomes than those with low C-section rates, and this holds true regardless of the type of hospital.¹⁴

The United States' skyrocketing C-section rate is expensive. According to the most recent study by the U.S. Agency for Healthcare Research and Quality, hospital charges for mother's pregnancy and delivery of newborn infants far exceed charges for any other hospital condition in the U.S.—representing a combined \$86 billion billed in 2006 alone.¹⁵ Of this, charges for mother's pregnancy and delivery amounted to approximately \$48 billion, making pregnancy and delivery the second-most expensive hospital condition in the United States, surpassed only by coronary artery disease.¹⁶

C-sections cost anywhere between an additional 33%¹⁷ to double¹⁸ that of vaginal deliveries for maternal care depending on the study.¹⁹ Unnecessary C-sections also create additional costs for the care of newborns. Babies born by elective C-section are more likely to be delivered early and suffer from breathing problems, necessitating NICU care that could have been avoided had they been delivered vaginally.²⁰ In this connection, it bears noting that women with private insurance were 33% more likely to receive a C-section than uninsured women, and women with Medicaid coverage were 17% more likely to have a C-section than uninsured women.²¹

The total actual cost to the country of the C-section epidemic is hard to precisely pinpoint because Medicaid and private insurers payments fall below

12. Nancy Shute, *Doctors Urge Patience and Longer Labor To Reduce C-Sections*, NPR (Feb. 20, 2014), <http://www.npr.org/sections/health-shots/2014/02/20/280199498/doctors-urge-patience-and-longer-labor-to-reduce-c-sections>. In fact, babies born by elective C-section are 50% more likely to have low APGAR scores. Myers, *supra* note 8, at 533; *see also*, Megan Thielking, *Sky High C-section Rates in the U.S. Don't Translate to Better Birth Outcomes*, STAT NEWS (Dec. 1, 2015), <https://www.statnews.com/2015/12/01/cesarean-section-childbirth/> [hereinafter *Sky High C-section Rates*].

13. MORRIS, *supra* note 2 at 16.

14. *Id.*; Sindhu K. Srinivas et al. *Evaluating the Risk-Adjusted Cesarean Delivery Rate as a Measure of Obstetric Quality*, 115 OBSTETRICS GYNECOLOGY 1007, 1007 (2010).

15. This is the Agency for Healthcare Research and Quality's ("AHRQ") most recent report on hospital cost. LAUREN M. WIER & ROXANNE M. ANDREWS, AGENCY FOR HEALTHCARE RESEARCH & QUALITY, THE NATIONAL HOSPITAL BILL: THE MOST EXPENSIVE CONDITIONS BY PAYER, 2008 (2011), <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb107.pdf>.

16. *Id.* at 7.

17. TRUVEN HEALTH ANALYTICS, *The Cost of Having a Baby in the United States* (2013), <http://transform.childbirthconnection.org/wp-content/uploads/2013/01/Cost-of-Having-a-Baby1.pdf>.

18. Grady, *supra* note 11 (reporting that C-section deliveries cost twice as much as vaginal deliveries).

19. *See* discussion *infra* Section II.A.

20. *See generally* Ashwin Ramachandrappa & Lucky Jain, *Elective Cesarean Section: Its Impact on Neonatal Respiratory Outcome*, 35 CLINICS PERINATOLOGY 373 (2008); Alan T.N. Tita et al., *Timing of Repeat Elective Cesarean Delivery at Term and Neonatal Outcomes*, NEW ENGLAND J. MED. 111 (2009).

21. C. ALLISON RUSSO ET AL., AGENCY FOR HEALTHCARE RESEARCH AND QUALITY, HOSPITALIZATIONS RELATED TO CHILDBIRTH, 2006 (2009), www.hcup-us.ahrq.gov/reports/statbriefs/sb71.pdf.

amounts billed. Today, Medicaid pays for almost half of deliveries.²² Conservatively speaking, the C-section epidemic costs over six billion dollars a year—two billion of which is borne by taxpayers in excess Medicaid payments.²³

Conventional wisdom holds that the overuse of the C-section is largely attributable to defensive medicine, itself an overreaction to physicians' concerns about malpractice liability exposure.²⁴ Under this "the lawyers made us do it rationale," the law bears primary responsibility for the healthcare profession's unwillingness to deliver babies vaginally.²⁵ The American College of Obstetricians and Gynecologists ("ACOG") cites lawsuits as a major reason not to deliver babies vaginally if a woman has had a prior cesarean.²⁶ In surveys and interviews, obstetricians routinely point to malpractice exposure as the reason they resort to C-sections.²⁷ Both obstetricians and the ACOG advocate for tort reform, in particular damage caps that would limit physician liability, as the key to reducing the nation's exorbitant C-section rate.²⁸ Obstetrician Jack Bianco sums up the view of his profession, "[the rising C-section rate is due to] four words: lack of tort reform."²⁹

If anything, the C-section is the poster child for defensive medicine and the need for tort reform. Contrary to this popular view, this Article shows that women do not experience fewer C-sections if they give birth in a place where damage caps on malpractice awards exist. Thus, either damages caps are insufficient to address physicians' concerns or other explanations better account for the overuse of the procedure.

Although the law has shouldered much of the blame for the nation's exorbitant C-section rate, the C-section epidemic has received surprisingly little attention in the legal literature.³⁰ This Article contributes to the current literature in two ways.

22. Phil Galewitz, *Nearly Half of U.S. Births Covered by Medicaid*, KAISER HEALTH NEWS (Sept. 3, 2013), <http://khn.org/news/nearly-half-of-u-s-births-are-covered-by-medicaid-study-finds>.

23. See discussion *infra* Section II.B.

24. See generally Karna Murthy et al., *Association Between Rising Professional Liability Insurance Premiums and Primary Cesarean Delivery Rates*, 1110 OBSTETRICS & GYNECOLOGY 1264, 1264 (2007); Kristi Ryan et al., *Change in Cesarean Section Rate as a Reflection of the Present Malpractice Crisis*, 69 CONN. MED 139, 139 (2005); Philip Zwecker et al., *Effect of Fear of Litigation on Obstetric Care: A Nationwide Analysis on Obstetric Practice*, 28 AM. J. PERINATOLOGY 277, 278 (2011); Denise Grady, *Trying to Avoid 2nd Cesarean, Many Find Choice Isn't Theirs*, N.Y. TIMES (Nov. 29, 2004), <http://query.nytimes.com/gst/fullpage.html?res=9C03E2DC103EF93AA15752C1A9629C8B63&pagewanted=all&mcubz=1>.

25. Myers, *supra* note 8, at 539.

26. *Id.*

27. JENNIFER BLOCK, PUSHED: THE PAINFUL TRUTH ABOUT CHILDBIRTH AND MODERN MATERNITY CARE 91–97 (2008) (discussing physicians' claims that they perform C-sections to avoid liability); MORRIS, *supra* note 2, at 46–48 (quoting physicians claiming that they perform C-sections to avoid liability); Margaret M. Donohue, *Our Epidemic of Unnecessary Cesarean Sections: The Role of the Law in Creating it, the Role of the Law in Stopping It*, 11 WISC. WOMEN'S L.J. 197, 210 (1996) [hereinafter Donohue, *Epidemic*] (liability is the most commonly cited nonclinical reason for performing a C-section).

28. Andrea M. Carpentieri et al., *Overview of the 2015 ACOG Survey on Professional Liability*, AM. C. OBSTETRICIANS AND GYNECOLOGISTS (Nov. 3, 2015), <https://www.acog.org/-/media/Departments/Professional-Liability/2015PLSurveyNationalSummary11315.pdf?dmc=1&ts=20180130T2326565322>.

29. MORRIS, *supra* note 2, at 165.

30. We found the following law review articles on the C-section problem: L. Indra Lusero, *Challenging Hospital VBAC Bans Through Tort Liability*, 20 WM. & MARY J. WOMEN & L. 399 (2014); Lisa Pratt, *Access to Vaginal Birth After Cesarean: Restrictive Policies and the Chilling of Women's Medical Rights During Childbirth*, 20 WM. & MARY J. OF WOMEN & L. 105 (2013); Elizabeth Kukura, *Choice in Birth: Preserving Access to*

First, this Article presents new aggregate empirical data that tests whether, from a *nationwide* perspective, women experience fewer C-sections if they give birth in a place where damage caps on malpractice awards exist. For the first time, this Article provides a national C-section rate for births subject to damage caps and a national C-section rate for births that are not subject to such caps. Just as the U.S. government annually reports the national C-section rate, which is widely relied upon in discussing the C-section problem, a national rate for births subject to damage caps versus those that are not is key to considering the potential efficacy of proposed tort reform at a federal level. A national perspective enables us to average large and small states and various hospitals types as well as to reflect on our national racial, cultural, maternal age, and health composition. The analysis reveals that women do not experience fewer C-sections if they give birth in a place where damage caps on malpractice awards exist. This analysis and data will assist policy-makers and advocates seeking to reduce the cesarean rate as well contribute to consideration of the efficacy of medical malpractice reform as a means to reduce the broader problem of medical overtreatment.³¹

What our research does show is that, even if malpractice concern contributes to the C-section problem, reducing malpractice exposure through commonly advocated damage caps does not provide the solution. Instead, other legal levers must be employed to encourage vaginal delivery and to discourage the over-use of C-sections. In light of this, the Article, as a second contribution, advocates for three legal initiatives to reduce the national C-section rate. These initiatives are timely. The ACOG finally acknowledged in 2014 that the national C-section rate is too high and has called for its reduction.³² The Article's initiatives support this call.

Part II reviews the rise of C-section rates, the economic costs of the C-section epidemic, and the enactment by states of damage caps to limit malpractice liability. This Part also reviews the handful of studies that have explored the

VBAC, 114 PENN ST. L. REV. 955 (2010); Lisa L. Chalidze, *Misinformed Consent: Non-Medical Bases for American Birth Recommendations as a Human Rights Issue*, 54 N.Y. L. SCH. L. REV. 59 (2010); Sylvia A. Law, *Childbirth: An Opportunity for Choice that Should Be Supported*, 32 N.Y.U. REV. L. & SOC. CHANGE 345 (2008); Donohue, *supra* note 27, at 197; Myers, *supra* note 12, at 526. Several articles have discussed the general issue of compromised maternal autonomy in childbirth decision-making of which obstetric resort to cesarean delivery is an example. See, e.g., Jamie R. Abrams, *The Illusion of Autonomy in Women's Medical Decision-Making*, 42 FLA. ST. U. L. REV. 1 (2015); Margo Kaplan, "A Special Class of Persons": *Pregnant Women's Right to Refuse Medical Treatment After Gonzales v. Carhart*, 13 U. PA. J. CONST. L. 145, 182 (2010); April L. Cherry, *Roe's Legacy: The Nonconsensual Medical Treatment of Pregnant Women and Implications for Female Citizenship*, 6 U. PA. J. CONST. L. 723, 734–736 (2004); and Michelle Oberman, *Mothers and Doctors' Orders: Unmasking the Doctor's Fiduciary Role in Maternal-Fetal Conflicts*, 94 NW. U. L. REV. 451, 478–482 (2000).

31. A voluminous body of literature exists on the effect of medical malpractice suits on the provision of medical care. See Joanna C. Schwartz, *A Dose of Reality for Medical Malpractice Reform*, 88 N.Y.U. L. REV. 1224, 1228 n.19 (2013) (listing studies); see also, David Hyman & Charles Silver, *The Poor State of Health Quality in the United States: Is Malpractice Liability Part of the Problem or Part of the Solution?* 90 CORNELL L. REV. 893, 896 (2005); Michelle Mello, *Medical Malpractice as an Epidemiological Problem*, 59 SOC. SCI. & MED. 39 (2004).

32. American College of Obstetricians and Gynecologists and Society for Maternal-Fetal Medicine, *Safe Prevention of the Primary Cesarean Delivery: Obstetric Care Consensus*, AM. J. OBSTETRICS AND GYNECOLOGY (March 2014).

relationship between C-section rates and damage caps. Part III lays out the methodology and findings of our study—the first empirical study to explore whether, from a nationwide perspective, based on aggregate data, women are less likely to give birth by C-section in states where damage caps have been in effect for at least three years as compared to states without such caps. We find no statistically significant difference.

Part IV discusses the policy implications of these findings. If damage caps do not reduce C-section rates, other solutions are needed to combat the C-section epidemic. We argue that policy-makers should consider three possible avenues of reform. First, they should alter the economic incentives so that physicians are paid more, or at a minimum not less, for vaginal deliveries than for cesarean deliveries—to compensate them for the extra time that vaginal deliveries entail. We further propose that recent federal and state pay-for-performance programs include appropriate cesarean rates among the measures used to reward hospitals and physicians for quality of healthcare. Second, we propose two novel measures to mitigate the role of malpractice insurers in promoting cesarean sections. Third, we join others in calling for mandatory public disclosure by hospitals and physicians of their C-section rates so that patients can make more informed decisions when choosing their healthcare providers.

II. RISE IN C-SECTION RATES AND RISE IN TORT REFORM

A. Rise in C-Section Rates

In 1965, when the United States first measured its C-section rates, C-sections accounted for 4.5% of U.S. births.³³ C-section rates rose in the 1980s and declined in the early 1990s.³⁴ After 1996, C-section rates began to climb, increasing for mothers in all age and racial groups and across all states.³⁵ The pace of the increase accelerated between 2000 and 2007.³⁶ By 2007, the U.S. C-section rate reached an unprecedented 32%.³⁷ U.S. government statistics released in 2015 (for births in 2013) show a national C-section rate of 32.7%.³⁸

C-section rates vary by state. New Jersey often has the highest C-section rate in the country, with rates exceeding 38%³⁹ and even reaching 40%.⁴⁰ Utah

33. Selma M. Taffel et al., *Trends in the United States Cesarean Section Rate and Reasons for the 1980–85 Rise*, 77 AM. J. PUBLIC HEALTH 955–59 (1987).

34. Fay Menacker & Brady E. Hamilton, *Recent Trends in Cesarean Delivery in the United States*, NAT'L CTR. FOR HEALTH STAT. DATA (Mar. 2010).

35. *Id.* at 2–5.

36. *Id.* at 1.

37. 57 BRADY E. HAMILTON ET AL., U.S. DEP'T OF HEALTH & HUM. SERVS., CTRS. FOR DISEASE CONTROL, BIRTHS: PRELIMINARY DATA FOR 2007 1 (2009), https://www.cdc.gov/nchs/data/nvsr/nvsr57/nvsr57_12.pdf.

38. 66 JOYCE A. MARTIN ET AL., U.S. DEP'T OF HEALTH & HUM. SERVS., CTRS. FOR DISEASE CONTROL, BIRTHS: FINAL DATA FOR 2015 56 (2017) (using Fig. 21 to explain 2013 data), https://www.cdc.gov/nchs/data/nvsr/nvsr66/nvsr66_01.pdf.

39. New Jersey often had the highest rate in the country with a rate of 38% in 2007, 40% in 2011, and along with Louisiana and Mississippi, with a rate above 38% in 2013. *See infra* note 83 (explaining 2007 data); *infra* note 85 (explaining 2013 data).

40. 62 JOYCE A. MARTIN ET AL., U.S. DEP'T OF HEALTH & HUM. SERVS., CTRS. FOR DISEASE CONTROL, BIRTHS: FINAL DATA FOR 2011 1 (2013), https://www.cdc.gov/nchs/data/nvsr/nvsr62/nvsr62_01.pdf.

has the nation's lowest rate with approximately 22% of its babies born by C-section.⁴¹

Differences in medical-risk factors for mothers, such as increased maternal age or obesity, do not explain the increase in the C-section rate.⁴² Increased maternal request for C-section delivery, as well as increased birth of multiples, may contribute to the increased C-section rate, but only marginally.⁴³ They certainly do not explain the magnitude of the increased resort to C-sections.⁴⁴ The national C-section rate has increased across *all* population groups, encompassing women of all ages, races, and education levels as well as low-risk women with no indication for a C-section listed on birth certificates.⁴⁵ Subjective indicators such as “non-reassuring fetal status” and “labor arrest disorder” account for most of the increase in the C-section rate.⁴⁶

B. *Costs of the C-Section Epidemic*

As discussed in the Introduction, unnecessary C-sections present serious health risks for both mothers and children. They also generate considerable additional charges and payments both for maternal care and for the care of newborns.

Turning first to maternal care, cesarean deliveries require anesthesia, operating room facilities, and prolonged hospital stays for mothers.⁴⁷ A study based on data from 2010 conservatively estimated that commercial insurers and their insured paid on average \$4,153 more for cesarean deliveries than for vaginal ones.⁴⁸ Medicaid paid approximately \$1,800 more on average for cesarean deliveries than for vaginal deliveries.⁴⁹ Today, Medicaid pays for almost half of deliveries, up from 45% in 2010.⁵⁰ Were the United States to reduce its C-section rate from 33% to the WHO-recommended maximum of 15%, we estimate that it would save, at a minimum, over \$870 million per year in unnecessary

41. *Id.*

42. Emma L. Barber et al., *Indications Contributing to the Increasing Cesarean Delivery Rate*, 118 OBSTETRICS AND GYNECOLOGY 29 (2011) [hereinafter Barber et al.].

43. *Id.* at 29 (reporting study on increased C-sections at Yale-New Haven Hospital finding that maternal requests explained 8% of increase in C-sections and multiple births explained 16% of increase and concluding that neither of these factors explained the magnitude of the C-section increase at that hospital and noting that the indication of multiples as a justification for C-section increased at a faster rate than the incidence of multiple gestation itself); Marian F. MacDorman et al., *Cesarean Birth in the United States: Epidemiology, Trends and Outcomes*, 35 CLINICS PERINATOL 293, 301 (2008) (concluding that increased C-section rate not attributable to increased maternal request for procedure).

44. Barber et al., *supra* note 42, at 29.

45. *Id.*; CAROL SAKALA ET AL., MATERNITY CARE AND LIABILITY: PRESSING PROBLEMS, SUBSTANTIVE SOLUTIONS 24 (2013).

46. Barber et al., *supra* note 42 at 33–34.

47. TRUVEN, *supra* note 17, at 33–34.

48. *Id.* at 17–18 (using Fig. 1 to explain 2010 data).

49. *Id.* at 19 (using 2010 data).

50. 62 SALLY S. CURTIN ET AL., U.S. DEPT. OF HEALTH & HUMAN SERVS., CTRS. FOR DISEASE CONTROL & PREVENTION, SOURCE OF PAYMENT FOR DELIVERY: BIRTHS IN A 33-STATE AND DISTRICT OF COLUMBIA REPORTING AREA, 2010 (2013), http://www.cdc.gov/nchs/data/nvsr/nvsr62/nvsr62_05.pdf. The most recent year for comprehensive source of payment data is 2010. More recent data show Medicaid paying for 50% of births as changes brought by the Affordable Care Act bring more uninsured mothers under Medicaid. Galewitz, *supra* note 22.

Medicaid payments⁵¹ and over \$1.6 billion per year in unnecessary health insurance payments for maternal care.⁵²

The numbers climb further when avoidable costs for newborn care are factored in. In 2010, average Medicaid payments for total maternal and newborn care involving vaginal and cesarean childbirths were \$9,131 and \$13,590, respectively.⁵³ Medicaid, thus, paid on average \$4,460 more for cesarean births over vaginal ones. Commercial insurers paid on average \$18,329 for total maternal and newborn care for vaginal births and \$27,866 for cesarean births.⁵⁴ Thus, private insurers paid on average an additional \$9,540 for cesarean births over vaginal ones. Were the United States to reduce its C-section rate from 33% to the WHO-recommended maximum of 15%, we estimate that it would save, at a minimum, some \$2 billion per year in unnecessary Medicaid payments⁵⁵ and an additional \$4 billion a year in unnecessary private insurance payments.⁵⁶

C. Tort Reform

Cesarean rates were not the only thing to rise in the decade between 1996 and 2007. During this period, many states enacted or reinstated non-economic damage caps on medical malpractice awards.⁵⁷ These caps limit the amount of money that patients can recover for pain and suffering to \$250,000 or \$500,000, depending on the state.⁵⁸ Investigations of the relationship between tort reform and impact in the medical malpractice area indicate that, of the various forms of

51. In 2015, 3,977,745 babies were born in the United States. 65 BRADY E. HAMILTON ET AL., U.S. DEP'T OF HEALTH & HUM. SERVS., CTRS. FOR DISEASE CONTROL, BIRTHS: PRELIMINARY DATA FOR 2015 1 (2016), https://www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65_03.pdf. Of these, approximately 1,988,873 were covered by Medicaid, of which approximately 656,328 were delivered by C-section. These C-sections exceeded the recommended WHO limit of 15% by 357,997 C-sections, resulting in \$644,395,000 in additional Medicaid payments based on payment costs for 2010. Health expenditures increased by 23.5% between 2010 and 2015. CTRS. FOR MEDICARE & MEDICAID SERVS., NHE FACT SHEET (December 12, 2016), <https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nhe-fact-sheet.html> (table 4). Assuming that C-section expenditures increased proportionately, potential Medicaid savings amounted to \$870 million in 2015 ($357,997 \times \$1,800 = \$644,395,000 + 23.5\% = \text{approximately } 870,000,000$).

52. Private insurance paid for 45.8% of U.S. births in 2010. CURTIN ET AL., *supra* note 50. Assuming similar private insurance coverage rates in 2015, approximately 1,821,807 births were covered by private insurance. Of these, approximately 601,196 were delivered by C-section, of which some 327,925 were above the WHO-recommended maximum of 15%. Taking 327,925 multiplied by \$4,153 = \$1.36 billion in potentially unnecessary insurance payments in 2010 dollars. Again, health expenditures increased 23.5% between 2010 and 2015. NHE FACT SHEET, *supra* note 51. Assuming that C-section expenditures increase proportionately, potential private insurance savings amount to \$1.6 billion in 2015 ($327,925 \times \$4,153 = \$1.36 \text{ billion} + 23.5\% \text{ health expenditure increase between 2010 and 2015} = \text{approximately } 1.6 \text{ billion.}$)

53. TRUVEN, *supra* note 17 at 6.

54. *Id.*

55. In 2015, approximately 357,997 cesarean births paid for by Medicaid exceeded the WHO limit of 15%. HAMILTON ET AL., *supra* note 51. The $357,997 \text{ births} \times \$4,460 = \$1.6 \text{ billion} + 23.5\% \text{ health expenditure increase between 2010 and 2015} = \1.975 billion.

56. In 2015, approximately 327,925 cesarean births paid by insurers were above the WHO recommended limit. NHE FACT SHEET, *supra* note 51. Taking $327,925 \text{ (surplus C-section births)} \times \$9,540 \text{ (extra cost of C-section)} = \$3.13 \text{ billion} + 23.5\% \text{ health expenditure increase between 2010 and 2015} = \3.87 billion.

57. Between 1996 and 2005, nine states (Florida, Georgia, Illinois, Mississippi, Nevada, Ohio, Oklahoma, South Carolina, and Texas) put in place or reinstated caps on malpractice awards. Fred J. Hellinger & William E. Encinosa, *The Impact of State Laws Limiting Malpractice Damage Awards on Healthcare Expenditures*, 96 AM. J. PUB. HEALTH 1375, 1376 (2006).

58. *Id.* at 1377.

tort reform, *non-economic* damage caps have the greatest effect on reducing claim frequency, claim-severity, and insurance premiums.⁵⁹

Non-economic damage caps appear to be having an effect in the obstetrics and gynecology area. A comparison of the five-year time period between 1986 and 1991 with the five-year time period between 2006 and 2011 revealed a 44% decrease in the number of paid claims for obstetricians and gynecologists, resulting in a total decrease in malpractice award payments of \$138 million in 2010 dollars.⁶⁰ While these reforms help medical malpractice insurers, do they help birthing women?

D. Literature Review

Only a very limited number of studies have considered whether damage caps reduce C-section rates, of which only a few have examined the issue from a national perspective.⁶¹ Moreover, we are aware of no study that has analyzed the issue using recent data or that has ascertained a national C-section rate for births where damage caps exist compared to a national C-section rate for births where caps do not exist. A national statistic is important when evaluating proposed federal damage caps as advocated by Republicans as part of a replacement of the Affordable Care Act.⁶² A review of the most pertinent literature to date follows.

Two leading multivariable regression analyses on the relationship between damage caps and C-section rates reached opposite conclusions. The first by Yang, Mello, Subramanian, and Studdert, based on data from 1991 to 2003, and controlling for variables culled from birth certificates, found between 1.9% and 1.25% lower cesarean rates in states in the years when caps on non-economic damages were in effect.⁶³ The effect appeared greatest when states limited non-economic damages to \$250,000 or less.⁶⁴ Yang and his associates estimated that nationwide damage caps of \$250,000 would have averted 12,800 C-sections in

59. MICHELLE MELLO, MEDICAL MALPRACTICE IMPACT OF THE CRISIS AND EFFECT OF STATE TORT REFORMS, RES. SYNTHESIS REP. #10 1, 9 (2006) (discussing how non-economic damage caps also have the greatest effect on physical location).

60. Janelle Yates, *Data on Liability Claims Offer Bright Spots for ObGyns—and Sobering Statistics*, 24(1) OBG MGMT. 44, 44 (2012); SAKALA ET AL., *supra* note 45, at 11 (“While overall claim frequency” has remained stable, “the number of large jury awards associated with maternity care has grown.”).

61. We are aware of only one study, by Yang et al., *infra* note 63, that has examined this question from a national perspective. *See also*, SAKALA ET AL., *supra* note 45, at 13, 57 (noting that the literature on the relationship between damage caps and C-section rates is modest at best).

62. Yang et al., *infra* note 63.

63. Y. Yang et al., *Relationship Between Malpractice Litigation Pressure and Rates of Cesarean Section and Vaginal Birth after Cesarean Section*, 47 MEDICAL CARE 234 (2009). Yang et al. used data from birth certificate information collected by the states and sent to the National Center for Health Statistics. *Id.* at 235. “That dataset includes method of delivery as well as demographic and lifestyle characteristics of the mother.” *Id.* The control variables included provider factors such as hospital ownership and location and managed care penetration; patients’ medical-risk factors; and maternal socioeconomic factors, including race and education. *Id.* at 236.

64. States with caps of \$250,000 or less had a 1.92% higher vaginal birth following C-section (“VBAC”) rate. *Infra* note 99. Those with caps between \$250,001 and \$500,000 had a 1.37% higher VBAC rate. Those with caps above \$500,000 had a 1.25% higher VBAC rate. *Id.* at 239.

2006⁶⁵ out of the more than 1.3 million C-sections performed that year, a reduction of less than 1%.⁶⁶

In contrast, a second analysis performed by Currie and MacLeod (based on data from 1989 to 2001 in the four states that had changed their tort laws in this period) found a 5% increase in the likelihood of a woman delivering by C-section in a state in the years when non-economic damages were in effect.⁶⁷ They hypothesize that this counter-intuitive result may flow from doctors' increased willingness to succumb to financial incentives and perform the more profitable and less time-consuming C-sections when they harbor less fear of liability exposure and hence shoulder less responsibility for their errors.⁶⁸ In other words, when the malpractice litigation cat is away, the revenue-seeking mice play.

A 2012 regression analysis by Frakes builds on the work of Currie and MacLeod.⁶⁹ Frakes expands the examined covered period to 1979-2005 to encompass more states.⁷⁰ He finds an association between a state's adoption of a non-economic damages cap and "a statistically insignificant 0.1 percentage point reduction in the state's cesarean rate."⁷¹

Thus, three different regression analyses attempting to control for a myriad of medical, racial, and economic variables that may impact the utilization of cesarean sections in a state reach different, and even opposite, conclusions on the effect of a state's adoption of non-economic damage caps on its C-section rate: positive effect, negative effect, and no effect.⁷²

65. *Id.*

66. 57 JOYCE MARTIN ET AL., U.S. DEP'T OF HEALTH & HUM. SERVS., CTRS. FOR DISEASE CONTROL, BIRTHS: FINAL DATA FOR 2006 1 (2009), https://www.cdc.gov/nchs/data/nvsr/nvsr57/nvsr57_07.pdf.

67. Janet Currie & W. Bentley MacLeod, *First Do No Harm? Tort Reform and Birth Outcomes*, 123 Q. J. ECON. 795, 819-821 (2008). Like in the Yang study, the data comes from state birth certificates reported to the national Center for Health Statistics. *Id.* at 814. The study controlled for "high risk" using seventeen different variables for the mother and multiple variables for complications arising out of labor and delivery. *Id.* The study also controlled for such things as the mother's age, race, and marital status and only considered states that had changed their damage caps between 1989 and 2001. *Id.* at 815. According to Frakes, *infra* note 69, at 461, only four states adopted damage caps within this period.

68. Currie & MacLeod, *supra* note 67, at 797. For the general possibility of damage caps actually increasing physician-induced demand or "offensive medicine," see Ronen Avraham & Max Schanzenbach, *The Unexpected Effect of Caps on Non-Economic Damages*, 30 INT'L REV. L. & ECON. 291 (2010).

69. Michael Frakes, *Defensive Medicine and Obstetric Practices*, 9 J. EMPIRICAL LEGAL STUD. 457 (2012).

70. *Id.* at 461. He tests for defensive C-sections using the following formula: $U_{i,s,t} = \alpha + \gamma_s + \lambda_t + \phi_{s,t} + \beta_1 \text{CAP}_{s,t} + \beta_2 \text{Z}_{s,t} + \beta_3 \text{O}_{s,t} + \epsilon_{i,s,t}$. The variables in the formula include, *inter alia*, the mother's age, race, and insurance status; hospital ownership type and bed size; state characteristics including HMO penetration rate, OB/GYN concentration rate, fertility rate, and median household income; and a variety of factors that impact the medical "appropriateness/need" of having a C-section, including, among others, maternal age, prolonged labor, dysfunctional labor, precipitous labor, premature rupture of the membranes, and a previous C-section. *Id.* at 468-70.

71. *Id.* at 477.

72. Two earlier national studies bear mention, though both covered relatively short periods of time. The first found little evidence of an increase in C-section utilization in response to higher malpractice costs as measured by malpractice premium increases or increased average malpractice awards based on data from 1992-1993 and 1998-2001. K. Baicker & A. Chandra, *The Effect of Malpractice Liability on the Delivery of Healthcare*, 8 F. FOR HEALTH & ECON. & POL'Y 1, 7, 20-21 (2005). The second found that cesarean section rates "are not sensitive" to state-level malpractice risk based on data from 1992-1998, using malpractice payments and per-physician number of claims as measures of malpractice risk. Beomsoo Kim, *Current Research on Medical Malpractice Liability: The Impact of Malpractice Risk on the Use of Obstetrics Procedures*, 36 J. LEGAL STUD. 79, 87 (2007).

The differing results indicate the difficulty of accounting for all the variables that might separate medically indicated C-sections from unnecessary ones. Most vaginal and C-section deliveries are billed as deliveries “with complications.”⁷³ One would expect attending physicians, as a matter of consistency, to ordinarily indicate a harmonizing medical “complication” in the birth certificates as well. (The birth certificates form the basis for the medical variables used in the regression analyses.) Again, subjective indicators such as “non-reassuring fetal status” and “labor arrest disorder” account for most of the increase in the C-section rate.⁷⁴

III. EMPIRICAL STUDY COMPARING THE NATIONWIDE C-SECTION RATE FOR BIRTHS SUBJECT TO DAMAGE CAPS TO BIRTHS WITHOUT DAMAGE CAPS

A. Methodology

We set out to ascertain whether women are less likely to have a C-section if giving birth in those states with damage caps as compared to states without such caps. Unlike prior studies, we approached the issue from a birds-eye perspective using recent aggregate data. A national birds-eye perspective enables us to average large and small states and various hospitals types as well as to reflect our national racial, cultural, and maternal age and health composition. The use of more recent data more accurately reflects today’s overall birthing environment. It also provides a longer time horizon for considering the impact of damage caps, which may take longer than a year after adoption to shape obstetrician delivery practices.

Just as the U.S. government reports the national C-section rate, which is widely relied upon in discussing the C-section problem, it would be useful to know what the national C-section rate is for births subject to damage caps versus those that are not. A national rate provides the most relevant statistic for any tort reform at the federal level as proposed repeatedly in Congress⁷⁵ and currently advocated by Republicans as part of a replacement for the Affordable Care Act.⁷⁶ A finding that damage caps reduced elective C-section rates would support damage caps as an important part of combating the C-section epidemic as

73. RUSSO ET AL., *supra* note 21, at 2.

74. Barber et al., *supra* note 42 at 33–34.

75. See, e.g., Protecting Access to Care Act, H.R. 12155, 115th Cong., § 31 (2017) (proposing \$250,000 cap on non-economic damages passed House).

76. John McDonough & Max Fletcher, *What Would Republicans Do Instead of the Affordable Care Act*, HEALTHAFFAIRS BLOG (Sept. 18, 2015), <http://healthaffairs.org/blog/2015/09/18/what-would-republicans-do-instead-of-the-affordable-care-act/> (analyzing Republican proposals for the replacement of Obamacare and finding most to include damage caps for malpractice). These Republican proposals to limit damages for malpractice are hardly new. For example, as a candidate for the U.S. Senate, Ted Cruz ran as a conservative champion of tort reform. See, e.g., *Bush Outlines Medical Liability Reform*, CNN INSIDE POLITICS (Jan. 16, 2003, 4:07 PM), <http://www.cnn.com/2003/ALLPOLITICS/01/16/bush.malpractice/index.html> (noting that President George W. Bush advocated malpractice damage caps); Elizabeth Williamson, *Two sides of Ted Cruz: Tort Reformer and Personal Injury Lawyer*, N.Y. TIMES (Jan. 20, 2016), http://www.nytimes.com/2016/01/21/opinion/two-sides-of-ted-cruz-tort-reformer-and-personal-injury-lawyer.html?_r=0.

advocated by the American Medical Association⁷⁷ and the ACOG⁷⁸ and endorsed by political leaders.⁷⁹

We began our study in 2010 and ended it in 2015. Our study used birth data from 2007, which was the most recent data available from the U.S. Centers of Disease Control (“CDC”) when we began our work, and birth data from 2013, which was the latest data available from the CDC when we ended our study.⁸⁰ The CDC takes two to three years to gather and release annual birth data, which is why the study is based on birth data from 2007 and 2013. We obtained data on states’ non-economic damage caps from McCullough, Campbell, and Lane’s *Medical Malpractice Summary Index of States*, which provides an up-to-date accounting of state tort reform in this area.⁸¹

In 2007, twenty-eight states had non-economic damage caps in place for at least three years.⁸² The CDC’s final national vital statistics report for 2007 indicates C-section rates by state⁸³ and total births by state.⁸⁴ From these numbers, we calculated the total number of C-section births by state (see Appendix, Table I). We compared the likelihood of a woman receiving a C-section where damage caps exist versus when they do not in two ways.

First, we compared the total number of births by C-section where damage caps exist with the total number of births by C-section where caps do not exist. This enabled us to arrive at a national C-section rate for each. A total of 2,839,268 babies were born in states with damage caps. Of these, 909,318 were delivered by C-section. Meanwhile, 1,476,965 babies were born in states without damage caps. Of these, 463,468 were born by C-section.

In 2007, women in the United States who gave birth where damage caps exist had a 32.03% chance of delivering by C-section. In comparison, women

77. AM. MED. ASS’N, MEDICAL LIABILITY REFORM NOW!: THE FACTS YOU NEED TO KNOW TO ADDRESS THE BROKEN MEDICAL LIABILITY SYSTEM 1, 2 (2017), http://www.ama-assn.org/ama1/pub/upload/mm/399/mlr_tp.pdf.

78. See MORRIS *supra* note 2, at 32. ACOG has declared a liability crisis in maternity care. Carpentieri, *supra* note 28; see also, Aaron B. Caughey et al., *Safe Prevention of the Primary Cesarean Delivery*, 210 AM. J. OBSTETRICS & GYNECOLOGY 179, 189 (2014) (“A necessary component of culture change will be tort reform because the practice environment is extremely vulnerable to external medicolegal pressures.”).

79. See CARY ELLIOT, CONG. BUDGET OFFICE, THE EFFECTS OF TORT REFORM: EVIDENCE FROM THE STATES (Christine Bogusz et al. eds., 2004) (highlighting a survey of literature on tort reform that indicates caps on damages reduce the number of lawsuits, the value of awards, and the number of payouts made by insurers relative to premiums); Hellinger & Encinosa, *supra* note 57, at 1375 (“[P]roponents believe that the passage of such laws reduces healthcare expenditures because the laws reduce the practice of defensive medicine”); W. Kip Viscusi & Patricia H. Born, *Damages Caps, Insurability, and the Performance of Medical Malpractice Insurance*, 72 J. RISK & INS. 23, 26–28 (2005) (finding, based on data from 1984 to 1991, that limits on non-economic damages and punitive damages reduced insurance payouts and increased the profitability of insurance companies).

80. The Centers for Disease Control and Prevention (“CDC”) provides annual data on U.S. births. It takes, however, two to three years to process and release this data. Thus, in 2010, the CDC released birth data from 2007, *infra* note 84, and in 2015, it released birth data from 2013, *infra* note 86.

81. *Medical Malpractice Summary Index of States*, MCCULLOUGH CAMPBELL & LANE LLP (last visited Sept. 19, 2017), www.mcandl.com/states.html.

82. See Hellinger & Encinosa, *supra* note 57, at 1376 (Table 1). See *id.* for a table current in 2007.

83. 58 JOYCE MARTIN ET AL., U.S. DEP’T OF HEALTH & HUM. SERVS., CTRS. FOR DISEASE CONTROL, BIRTHS: FINAL DATA FOR 2007 1 (2010), https://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_24.pdf.

84. *Id.* at 79 (Table III).

who gave birth where damage caps did not exist actually had a slightly lower 31.38% chance of delivering by C-section, a difference of 0.65%.

Second, we compared the average C-section rate of states with damage caps with the average C-section rate in states without caps. The twenty-eight states with damage caps had an average C-section rate of 30.42%. The District of Columbia and the twenty-two states without damage caps had a slightly higher average C-section rate of 30.88%, a difference of 0.46%.

We repeated this analysis using final birth data for 2013 by the CDC released in 2015⁸⁵ (see Appendix, Table II). Between 2007 and 2013, three states changed their damage-cap laws.⁸⁶ In 2012, North Carolina established a \$500,000 cap on non-economic damages in medical malpractice cases.⁸⁷ Meanwhile in 2010, courts deemed damage caps unconstitutional in both Georgia⁸⁸ and Illinois.⁸⁹

Again, we first compared the total number of births by C-section in states with damage caps with the total number of births by C-section in states without. In 2013, 2,291,214 babies were born in states with damage caps, excluding North Carolina, which had damage caps in place for less than a year. Of these, 756,958 were delivered by C-section.⁹⁰ Meanwhile, 1,236,286 babies were born in states without damage caps, excluding Georgia and Illinois. Of these, 396,873 were born by C-section.⁹¹

In 2013, women who gave birth in states where damage caps were in effect delivered by C-section 33.04% of the time, excluding North Carolina (32.91% with North Carolina). In comparison, once again women who gave birth without caps in effect, once again, had a lower chance of delivering by C-section—32.10%, excluding Georgia and Illinois (32.20% with these two states).

In sum, the nationwide C-section rate for births in places where damage caps were in effect from 2005 to 2013 was nearly 1% higher than the nationwide C-section rate for births that occurred in places where caps were not in place.

Second, we compared the average C-section rate of states with damage caps in 2013 with the average C-section rate of states without caps. The states with damage caps had an average C-section rate of 31%. This number remains the same with or without North Carolina. The District of Columbia and the twenty-one states without damage caps had a slightly higher average C-section rate of 31.37% without Georgia and Illinois and 31.5% with them.

Finally, we considered whether the twenty-six states that had damage caps in place between 2007 and 2013 had a lower rate of change in their C-section rate than the twenty-two jurisdictions without damage caps in this period. We found that states with damage caps experienced a 0.65% average increase in

85. MARTIN ET AL., *supra* note 4, at 61 (Table 1 and Table I-7).

86. *Medical Malpractice Summary Index of States*, *supra* note 81.

87. N.C. GEN. STAT. ANN. § 90-21.19 (West 2012), amended by S.L. 2015-40, § 9.

88. *Atlanta Oculoplastic Surgery P.C. v. Nestlehutt*, 691 S.E.2d 218, 225–26 (Ga. 2010).

89. *Lebron v. Gottlieb Memorial Hospital*, 930 N.E.2d 895, 914 (Ill. 2010).

90. With North Carolina, the numbers increase to 2,410,216 total births and 793,135 C-section births.

91. With Georgia and Illinois, the numbers increase to 1,521,965 babies born in states without damage caps, of which 490,652 were born by C-section.

their C-section rates. Those without damage caps experienced a slightly lower average increase of 0.51%.

We then performed a statistical test to see if the slight differences uncovered were statistically significant. The statistical test revealed no statistical difference (see Appendix, Statistical Analysis by Professor of Statistics Ruth Heller⁹²).

B. Findings

From a nationwide perspective, we found no statistical difference in C-section rates between states with damage caps and those without for both 2007 and 2013.

FIGURE 1

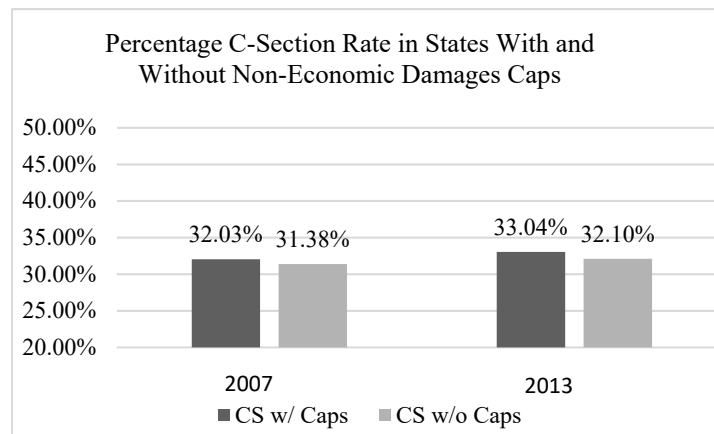
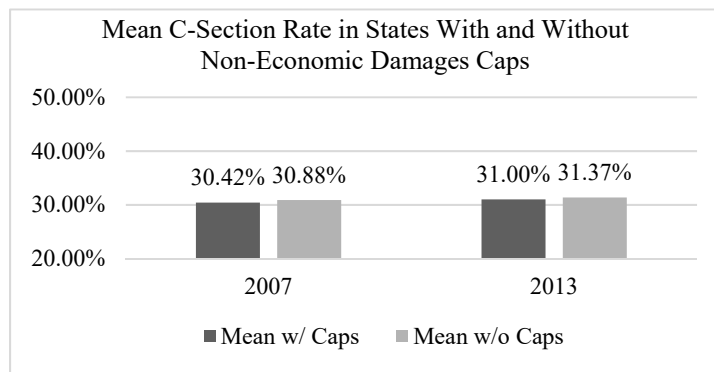


FIGURE 2



92. Associate Professor, Department of Statistics and Operations Research, University of Tel Aviv and 2015–2016 Senior Visiting Fellow, National Cancer Institute Division of Cancer Epidemiology and Genetics, Biostatistics Branch. The analysis and conclusions are those of Dr. Heller and do not reflect the views of the National Cancer Institute.

We further found that states with damage caps experienced no statistically different rate of change in their C-section rates between 2007 and 2013 than did those without damage caps.

FIGURE 3

Rate of Change	with caps	without caps
Between 07 and 13	.65%	.51%

Our findings comport with a 2014 report by the CDC on C-section rates. Of the four states that have shown a decline of 5% or more in C-section rates between 2009 and 2012, two, Utah and North Dakota, have damage caps and two, New York and Oregon, do not.⁹³

This is not to say that physician concern about malpractice does not play an important role in our national C-section epidemic. It does. Lawsuits against physicians allege failure to deliver by C-section ten times more often than failure to deliver the baby vaginally.⁹⁴ Physicians are, thus, sued for failing to perform a C-section far more often than for performing the procedure unnecessarily. Moreover, lawsuits for unnecessary C-section have been met with little success.⁹⁵ Obstetricians have the second-highest malpractice insurance rates of any medical specialty, surpassed only by neurosurgeons.⁹⁶ They also have one of the highest lawsuit rates of any medical field.⁹⁷ Fear of liability has also contributed to obstetricians' unwillingness to perform vaginal births following a C-section and to hospital bans on the practice.⁹⁸

What our research does show, however, is that even if malpractice concerns contribute to the C-section problem, reducing malpractice exposure through commonly advocated damage caps does not provide the solution. Instead, other legal levers must be employed to encourage vaginal delivery and to discourage the over-use of C-sections.

IV. INITIATIVES TO REDUCE THE C-SECTION RATE

Two important recent health policy steps seek to reduce the C-section rate in the United States. The first addresses the ban on vaginal births by women who have delivered previously by C-section (referred to as vaginal birth after C-section or "VBAC"). In 2010, a National Institute of Health ("NIH") panel called

93. 63 MICHELLE J.K. OSTERMAN & JOYCE A. MARTIN, U.S. DEP'T OF HEALTH & HUM. SERVS., CTRS. FOR DISEASE CONTROL, PRIMARY CESAREAN DELIVERY RATES BY STATE: RESULTS FROM THE REVISED BIRTH CERTIFICATE, 2006-2012 (2014), https://www.cdc.gov/nchs/data/nvsr/nvsr63/nvsr63_01.pdf.

94. Kim, *supra* note 72, at 83.

95. Donohue, *Epidemic*, *supra* note 30, at 212; Kukura, *supra* note 30, at 968-69.

96. Yang et al., *supra* note 63, at 234-35.

97. Donohue, *Epidemic*, *supra* note 30, at 210-11.

98. See David J. DeNoon, *NIH Panel: End Bans on Vaginal Birth After C-Section*, WEBMD (Mar. 10, 2010), <http://www.webmd.com/baby/news/20100310/nih-panel-end-bans-on-vaginal-birth-after-csection>; *Medical Liability Climate Hurts Patients and Ob-Gyns*, AM. C. OBSTETRICIANS AND GYNECOLOGISTS (Sept. 5, 2012), <https://www.acog.org/About-ACOG/News-Room/News-Releases/2012/Medical-Liability-Climate-Hurts-Patients-and-Ob-Gyns?IsMobileSet=false&p=1>.

for an end to VBAC bans.⁹⁹ Later that year, the American College of Obstetricians and Gynecologists (“ACOG”) issued a new set of guidelines to enable more women to deliver vaginally following a C-section.¹⁰⁰ Second, in February of 2014, the ACOG and the Society for Fetal Medicine issued a watershed statement that acknowledged that the national C-section rate was too high and called for a reduction in the number of primary C-sections.¹⁰¹ Most C-sections are performed on first-time mothers.¹⁰² If a woman can escape having a C-section for her first birth, she has a good chance of avoiding it in subsequent pregnancies. The ACOG’s core recommendation is that physicians exercise greater patience and let labor unfold. Indeed, it has been said that the piece of equipment in the delivery room that most leads to a C-section is the clock.¹⁰³

Like tort reform, these efforts will not be enough. The economic incentives that encourage C-sections must be addressed. To begin the conversation, this Part outlines three policy initiatives to support efforts to reduce the national C-section rate. Each of these initiatives, on its own, warrants article-length treatment. The discussion here aims to show that there exists a range of policy interventions that can address the C-section epidemic.

A. Payment Reform

Policy-makers and health law scholars often look to payment reform as a means to reduce unnecessary medical procedures.¹⁰⁴ Payment reform can play a role in curtailing the C-section epidemic. In particular, Harold Miller, a national expert on healthcare payment and delivery reform who has considered the issue in the context of the C-section epidemic, suggests a single payment to a hospital, regardless of whether a birth is by C-section or vaginally, with additional payments for complications regardless of the mode of delivery.¹⁰⁵

99. DeNoon, *supra* note 99 (explaining that the NIH panel calls for an end to bans that prevent women who have had a C-section from having a natural birth in later pregnancies. About 75% of women successfully deliver vaginally after previous cesarean delivery, “assuming that it’s not a multiple birth, that the baby is in the normal position, and that their previous C-section required only a single incision.” Many hospitals, however, have “VBAC bans”—“policies that forbid a vaginal birth after a cesarean . . . unless fully equipped and staffed surgical and anesthesia services are readily available. These policies align with . . . guidelines set by gynecology and anesthesia professional societies.” After the guidelines when in to effect, 30% of hospitals stopped offering VBACs).

100. Denise Grady, *New Guidelines for Caesareans*, N.Y. TIMES, July 22, 2010, at A1.

101. Am. C. of Obstetricians and Gynecologists, *Safe Prevention of the Primary Cesarean Delivery*, OBSTETRIC CARE CONSENSUS, Mar. 2014, at 1, 14.

102. Shute, *supra* note 12.

103. Interview with prominent childbirth policy expert (Oct. 27, 2015) (on file with author).

104. See, e.g., Isaac D. Buck, *Enforcement Overdose: Healthcare Fraud Regulation in an Era of Overcriminalization and Overtreatment*, 74 MD. L. REV. 259, 276 (2015) (setting forth replacement of fee-for-service with incentive-based salaried compensation for healthcare providers as well as a system of direct payments to patients to eliminate cost insensitivity); Atul Gawande, *Overkill*, NEW YORKER (May 11, 2015), <https://www.newyorker.com/magazine/2015/05/11/overkill-atul-gawande> (suggesting payment bonuses to reward physicians for better care); *infra* note 116 (describing recent government initiatives to increase compensation for primary care physicians).

105. HAROLD MILLER, CTR. FOR HEALTHCARE QUALITY & PAYMENT REFORM, TRANSFORMING MATERNITY CARE HOW PAYMENT REFORM CAN LOWER COSTS AND IMPROVE QUALITY 48, 64, 69 (2012), <http://www.chqpr.org/downloads/MaternityCarePaymentReform2012.pdf>.

This Section proposes two new payment reforms. First, it advocates for a reversal of current compensation practices. It argues that obstetricians should be paid *more* for vaginal deliveries than for C-sections to compensate them for the additional time that vaginal deliveries entail. Second, it suggests the inclusion of C-section rates in the recently promulgated metrics for Medicare and other payer hospital and provider reimbursement.

At present, there exists a perverse economic incentive to deliver a baby by C-section. Obstetricians receive on average nearly 30% more for delivering by C-section rather than for delivering vaginally, earning on average an extra \$1,269 from commercial payers and an extra \$618 more from Medicaid per birth.¹⁰⁶ An even greater economic discrepancy exists when one takes into account the additional hours that an obstetrician must work to attend a vaginal delivery. A non-emergency C-Section takes an hour, including delivery of the placenta and suturing of the incisions.¹⁰⁷ A normal first-time vaginal delivery, in contrast, takes six and a half hours,¹⁰⁸ with many women (and their attending OBs) laboring much longer.¹⁰⁹

One may fairly conclude that obstetricians receive insufficient compensation for their efforts to deliver a baby vaginally as compared to delivery by cesarean section. A National Public Radio interview with Dr. Aaron Caughey, chief of obstetrics and gynecology at Oregon Health Sciences and lead author of the new ACOG guidelines, sheds light on the problem. He explains that normal labor actually takes longer than obstetricians had thought. Today's obstetric guidelines for normal labor hail from a 1955 study of 500 women, of which 200 had "idealized labor." He relates that for the next fifty years, obstetricians "managed four million women a year" based on the idealized time frame of 200 women.¹¹⁰ What explains half a century's dearth of further research into a healthy period for labor? "There's no money in being patient in labor. Because of that, nobody has really pushed to look at this again."¹¹¹

If we want obstetricians to spend more time and let labor unfold as recently recommended by the ACOG, we need to provide an economic incentive for them to do so. Obstetricians must be paid more to compensate them for the additional time it takes to deliver a baby vaginally rather than by C-section. Instead, the opposite is happening. A recent report on C-sections by a team led by Dr. Carol

106. TRUVEN, *supra* note 17, at 6.

107. *Cesarean Birth (C-Section)*, CLEVELAND CLINIC, <https://my.clevelandclinic.org/health/articles/cesarean-birth-c-section> (last visited Jan. 30, 2018).

108. Richard Knox, *Babies Take Longer to Come out Than They Did in Grandma's Day*, NPR (Mar. 31, 2012, 6:50 PM), <http://www.npr.org/sections/health-shots/2012/03/30/149718838/babies-take-longer-to-come-out-than-they-did-in-grandmas-day> (reporting that today, a typical first-time mother takes six and a half hours of labor to give birth, while first-time mothers fifty years ago labored for about four hours) (citing federal study that compared 140,000 births from the two time periods by Dr. Katherine Laughon and Dr. Ware Branch). One major implication is that OBs may be rushing to perform C-sections too early because they are using a dated yardstick for normal delivery time. *Id.*

109. Shute, *supra* note 12. Admittedly, an obstetrician delivering vaginally can supervise more than one delivery at a time and therefore may not be devoting the entire labor period to just one patient, particularly in the case of larger obstetric practices. Obstetricians, however, cannot efficiently and conveniently schedule vaginal deliveries back to back as can be done with cesarean deliveries.

110. *Id.*

111. *Id.*

Sakala explains that the more cost-constrained health environment of recent years “creates pressure to adjust practice style by accelerating patient throughput for greater time efficiency for clinicians and facilities and/or by providing additional services to increase revenue.”¹¹²

To reduce the C-section rate, countervailing economic pressure must be brought to bear. First, state Medicaid programs could, and should, adjust their reimbursement schedules to increase the rate paid to physicians for vaginal deliveries over that paid for C-section deliveries. Such an initiative aligns with current efforts to better compensate providers of primary care rather than to economically favor technologically driven interventions and treatment options, such as C-sections.¹¹³ State Medicaid programs pay for almost half of all deliveries.¹¹⁴ While state governments would end up paying obstetricians more under such a policy, the overall cost of childbirth would decline given the savings in hospital charges. Women spend twice as much time in a hospital following a C-section than following a vaginal delivery. Furthermore, C-section deliveries occasion additional expensive hospital fees such as operating room and anesthesia charges.

Second, state law could require insurers to pay physicians more for vaginal deliveries than for C-section deliveries. Legal precedent exists for this kind of initiative. The Newborns and Mothers Health Protection Act, for example, required insurance companies to pay for at least four days of hospital stay for a mother following a C-section delivery and for at least two days following a vaginal delivery.¹¹⁵ Just as the law recognized that women had to stay in hospitals longer following a cesarean delivery, this proposal recognizes that physicians must receive greater compensation for vaginal deliveries than for cesarean ones given the extra time that the former takes over the latter.

At a minimum, the law should require insurers to pay physicians no less for vaginal deliveries than they pay for cesarean deliveries to diminish the current perverse economic incentive that encourages C-sections. This would extend Dr. Miller’s single-payment model for hospitals to physicians.

In addition, we suggest that recent pay-for-performance initiatives include appropriate C-section rates among the measures used to reward hospitals and physicians for quality of healthcare. Pay-for-performance programs provide financial incentives for hospitals, physicians, and other healthcare providers to

112. SAKALA ET AL., *supra* note 45, at 11 (citations omitted).

113. MACPAC, AN UPDATE ON THE MEDICAID PRIMARY CARE PAYMENT INCREASE 131 (Mar. 2015), <https://www.macpac.gov/wp-content/uploads/2015/03/An-Update-on-the-Medicaid-Primary-Care-Payment-Increase.pdf> (reporting on the temporary primary-care-provider Medicaid rate increase for 2013 and 2014 and noting that obstetrician and gynecologist services were not eligible for this rate increase.)

114. Galewitz, *supra* note 22.

115. Under the Newborns’ And Mothers’ Health Protection Act (“Newborns’ Act”), if a group health plan, a health insurance company, or an HMO provides maternity benefits, it may not restrict benefits for a hospital stay in connection with childbirth to less than forty-eight hours following a vaginal delivery or ninety-six hours following a delivery by cesarean section. 45 C.F.R. § 146.130, (2017). U.S. DEP’T LABOR, FACT SHEET: NEWBORNS’ AND MOTHERS’ HEALTH PROTECTION ACT (Nov. 2016), <https://www.dol.gov/sites/default/files/ebsa/about-ebsa/our-activities/resource-center/fact-sheets/newborns-act.pdf>.

improve the quality and value of healthcare.¹¹⁶ Under the typical pay-for-performance program, Medicare, state Medicaid, and private insurers pay a bonus to a healthcare provider if the provider “meet[s] or exceed[s] agreed-upon quality or performance measures,” such as reducing certain hemoglobin levels in diabetic patients.¹¹⁷ Pay-for-performance programs also reward hospitals and physicians if they improve their performance over time.¹¹⁸ For example, Medicare and other payors reward hospitals if they reduce avoidable hospital readmissions.¹¹⁹

Medicare, state Medicaid, and private insurers are increasing their use of pay-for-performance programs, particularly in the aftermath of the Affordable Care Act, which encouraged such programs.¹²⁰ The federal Centers for Medicare and Medicaid Services (“CMS”) publishes a list of performance measures used by Medicare to reward healthcare providers for quality of care.¹²¹ State Medicaid and private insurer programs often mirror these performance metrics. At present, these measures do not take into account a hospital’s or a physician’s C-section levels.¹²² More importantly, they do not include reducing C-section levels as called for by the NIH and the ACOG as a healthcare-provider improvement metric.¹²³ They should. Hospitals and physicians should receive a bonus from public and private payors if they have achieved more appropriate C-section rates and, even more importantly, if they have improved by decreasing their C-section rates to more appropriate levels. As with other performance metrics, CMS would have to determine the C-section target rate or level of improvement rate through its consultation process. At present, an appropriate target would likely be in the neighborhood of 25%, which the nation achieved as recently as 2001.¹²⁴ CMS could adjust the rate over time as providers reduced their C-section rates.

Reduction of C-section rates constitutes a particularly suitable target for a performance-based, health-quality initiative. C-section rates are excessive, harmful to mothers and babies, expensive, and vary widely between hospitals. According to a 2016 study of low-risk births by Consumer Reports risk, about half of the C-sections performed could have been avoided.¹²⁵ The study showed

116. Julia James, *Pay-for-Performance*, HEALTH POL’Y BRIEFS (Oct. 11, 2012), http://healthaffairs.org/healthpolicybriefs/brief_pdfs/healthpolicybrief_78.pdf (describing recent pay-for-performance initiatives).

117. *Id.*

118. *Id.*

119. *Id.*; *Hospital Value-Based Purchasing*, CENTERS FOR MEDICARE AND MEDICAID SERVICES (Oct. 30, 2015), <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/hospital-value-based-purchasing/index.html>.

120. James, *supra* note 116; *Hospital Value-Based Pricing*, *supra* note 119.

121. See James, *supra* note 116, at 2–3; *Hospital Value-Based Pricing*, *supra* note 119.

122. See *FY 2016 Final Rule, Correction Notice and Consolidated Appropriations Act of 2016 Tables*, CENTERS FOR MEDICARE & MEDICAID SERVICES, <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/FY2016-IPPS-Final-Rule-Home-Page-Items/FY2016-IPPS-Final-Rule-Tables.html> (last visited Oct. 9, 2017) (Table 16B) [hereinafter *FY 2016 Final Rule*]; *FY 2015 Final Rule Tables*, CENTERS FOR MEDICARE & MEDICAID SERVICES, <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/FY2015-IPPS-Final-Rule-Home-Page-Items/FY2015-Final-Rule-Tables.html> (last visited Oct. 9, 2017) [hereinafter *FY 2015 Final Rule Tables*].

123. *FY 2016 Final Rule*, *supra* note 122; *FY 2015 Final Rule Tables*, *supra* note 122.

124. Menacker & Hamilton, *supra* note 34, at 1.

125. Tara Haelle, *Consumer Reports Investigates: Your Biggest C-Section Risk May Be Your Hospital*, CONSUMER REPS. (May 16, 2017), <http://pressroom.consumerreports.org/pressroom/2016/04/consumer-reports-investigates-your-biggest-c-section-risk-may-be-which-hospital-you-go-to.html>.

great variation in hospital C-section rates even in the same community.¹²⁶ In sum, many hospitals should be able to reduce their C-section rates and should receive incentives to do so.

B. Combating Malpractice Insurance Practices that Promote C-Sections

While many have focused on payment reform, as well as tort reform, as means to combat unnecessary medical procedures—of which C-section is one—few, if any, have considered whether malpractice insurance carriers themselves are fueling the C-section epidemic and whether steps should be taken to counteract their activities. This Section proposes two novel initiatives to mitigate the role of malpractice insurers in promoting C-sections.

1. Prohibiting Medical Malpractice Insurance Exclusions

Although no systemic empirical data exists as to the extent to which medical malpractice insurance companies are refusing to cover or threatening not to cover obstetricians for lawsuits stemming from VBACs or vaginal birth for multiples,¹²⁷ anecdotal evidence increasingly points to its occurrence. For example, the Physicians Liability Insurance Company (“PILCO”), the sole medical malpractice insurance company in Oklahoma, has reportedly stopped covering VBACs.¹²⁸ Jennifer Block found that at New Jersey’s St. Barnabas Medical Center some sixty obstetricians insured via a group malpractice plan with MDAdvantage reached a verbal understanding with the malpractice insurance company to stop attending VBACs as well as vaginal twin births.¹²⁹ The president of the obstetric group and liaison with MDAdvantage explained, “[w]e’re basically looking for ways to curb our liability.”¹³⁰ “You can’t tell someone how to practice,” he stated, so there is no “official directive” or written statement.¹³¹ Nonetheless, “an understanding” exists.¹³² According to the president of the group, physicians were informed of the understanding “by word of mouth.”¹³³ My own obstetrician told me, while I was pregnant with twins, that malpractice carriers had indicated that they may not cover the vaginal birth of twins.

Baker and Swedloff have shown how liability insurers use a variety of tools to essentially regulate those they insure to reduce the likelihood that the insurer will have to pay claims.¹³⁴ That medical malpractice insurers would formally or

126. *Id.*

127. Empirical data on the extent to which these practices are occurring would be extremely helpful. Unfortunately, such data is difficult to obtain given that malpractice insurance plans are largely proprietary and because resistance to cover certain vaginal births may be orally conveyed by the insurer to the insured, particularly given the growth of self-insurance or so-called captive insurance models. *See generally* Daniel Schwarcz, REEVALUATING STANDARDIZED INSURANCE POLICIES, 78 U. CHI. L. REV. 1263, 1322–26 (2011) (describing the general inaccessibility of insurance policies).

128. BLOCK, *supra* note 27, at 88.

129. *Id.*

130. *Id.* (quoting Donald Chervenak).

131. *Id.* (quoting Donald Chervenak).

132. *Id.*

133. *Id.* (quoting Donald Chervenak).

134. Tom Baker & Rick Swedloff, *Regulation by Liability Insurance: From Auto to Lawyers Professional Liability*, 60 UCLA L. REV. 1412, 1415 (2013).

informally press physicians to avoid vaginal births the insurer deems risky from a medical malpractice exposure viewpoint makes economic sense. As Baker and Swedloff generally note, “[o]nce an insurer underwrites a risk, the insurer has every reason to try to reduce its payouts by encouraging insureds to prevent the potential loss from materializing” in the first place.¹³⁵ In the C-section context, as discussed earlier, physicians are sued ten times more often for failing to deliver by C-section than for failing to deliver vaginally.¹³⁶ Furthermore, if a patient sues for a bad birth outcome and the birth occurred by C-section, the physician can claim in his or her defense that “everything was done,” thereby reducing the risk of an adverse judgment.¹³⁷

From an insurer’s standpoint, C-sections make further economic sense because they face little countervailing payout exposure for unnecessary C-sections. Few women sue for an unnecessary C-section,¹³⁸ and those that do are rarely met with success.¹³⁹ Even assuming a worst-case scenario, if a woman dies from an unnecessary C-section, the payout cost to a malpractice insurer is considerably less than the payout cost for the lifetime care of a child with cerebral palsy allegedly caused by a physician’s failure to perform a C-section.¹⁴⁰ Not only do medical malpractice insurers have every economic incentive to encourage those they insure to deliver by C-section rather than vaginally, such encouragement comports with their general focus on limiting their payment exposure through tort reform, rather than on initiatives to improve patient safety.¹⁴¹

The problem of malpractice insurance carriers curtailing coverage for vaginal deliveries that present a greater malpractice risk may become more pronounced over time. At present, an increasing number of physicians and physician groups work for hospitals.¹⁴² Most hospitals or health systems self-insure for malpractice through so-called “captive” malpractice insurance programs.¹⁴³ If a hospital or hospital system insures itself against malpractice claims, it has

135. *Id.*

136. Kim, *supra* note 72, at 83.

137. *Sky High C-section Rates*, *supra* note 12 (quoting surgeon at Massachusetts General Hospital).

138. We are aware of two lawsuits where the mother sued for an unnecessary C-section. *Meador v. Stahler & Gheridian* (Middlesex Superior Court C.A. No. 88-6450, Mass 1993); Anemona Hartocollis, *Mother Accuses Doctors of Forcing a C-Section*, N.Y. TIMES, May 17, 2014, at A18. Women in general rarely sue for birthing harms. Jamie R. Abrams, *Distorted and Diminished Tort Claims for Women*, 34 CARDOZO L. REV. 1955 (2013). Patients generally do not sue for unnecessary medical treatment. TOM BAKER, THE MEDICAL MALPRACTICE MYTH 3 (2005).

139. Yang et al., *supra* note 63, at 239. *Meador v. Stahler* is a rare case where a woman recovered for an unnecessary C-section that left her bedridden for several years. She received \$1.5 million.

140. Maternal death would result in payment for loss of earnings through retirement and loss of society and companionship. Unless the mother is a movie star, corporate executive, or the like, these damages would certainly be less than actual damages for the lifetime care of a child with cerebral palsy. Interview with Keith N. Biebelberg, experienced civil trial attorney. (Feb. 1, 2017).

141. See generally Baker & Swedloff, *supra* note 134, at 1437 (describing how medical malpractice insurance companies have largely refrained from encouraging behavior that would reduce medical errors, advocating instead for legislation that would make it more difficult for patients to bring medical malpractice claims, cap liability, and otherwise limit tort exposure).

142. Jeremy Brigham, *The New Physician Employment Model and Malpractice Insurance: What You Don't Know Could Cost You*, BECKER'S HOSP. REV. (Sept. 19, 2014), <http://www.beckershospitalreview.com/human-capital-and-risk/the-new-physician-employment-model-and-malpractice-insurance-what-you-don-t-know-could-cost-you.html> (“In the fight to remain competitive in the new era of healthcare, hospitals are buying physician practices and hiring individual physicians as quickly as possible.”)

143. *Id.*

both the incentive and the ability to formally or informally urge methods of medical practice at its facility that are advisable from a mitigation-of-malpractice-risk standpoint even if not in a patient's best interests. Indeed, a 2014 study by Cheng found that physicians employed by hospitals, so-called hospitalists, were the most likely to recommend a C-section, as compared to those in private practice or in an academic or HMO setting.¹⁴⁴

Just as the Affordable Care Act prohibits healthcare insurance carriers from discriminating against those with pre-existing conditions and mandates that health plans provide certain benefits,¹⁴⁵ federal or state law should prohibit medical malpractice insurance companies from denying or restricting malpractice coverage to physicians and to hospitals who perform VBACs or who deliver multiples vaginally. Under this proposal, state or federal law would mandate two things. First, the law would mandate that any entity that sells malpractice insurance or otherwise provides such insurance must cover vaginal delivery, without exception. Second, to prevent malpractice insurance companies from raising the rates of obstetricians that perform VBACs or vaginal birth of multiples, the law would mandate that insurers may not vary rates based on whether a physician delivers a baby vaginally or by cesarean section.

Mandated benefits, where the government decides which medical treatments and services insurers must cover, are well-known in the health insurance realm.¹⁴⁶ They could and should be applied to medical malpractice insurance in the obstetrics context as well. The press to deliver by C-section suffers from two market failures that have justified mandated benefits in the health insurance sphere. The first is the suboptimal utilization of a medical procedure¹⁴⁷—in this case, vaginal delivery particularly following a prior C-section. It is estimated that 30-40% of hospitals no longer permit VBACs.¹⁴⁸ The second is undesired insurance company coverage determinations¹⁴⁹—in this case, threatened or actual refusal to cover VBACs and the vaginal birth of multiples. If obstetricians are to follow ACOG's new recommendation to let labor unfold in more situations, they need assurance that they will enjoy malpractice coverage should anything go wrong.

144. Yvonne W. Cheng et al., *Clinicians' Practice Environment is Associated with a Higher Likelihood of Recommending Cesarean Deliveries*, 27 *MATERNAL FETAL NEONATAL MED.* 1220, 1222 (2014).

145. See Affordable Care Act (ACA), 42 U.S.C. §18022(a)(1), (b)(2) (2012) (requiring that plans cover certain essential benefits and delegating to the Department of Health and Human Services the responsibility of determining what the contours of essential benefits); Affordable Care Act (ACA), 42 U.S.C. § 18022 (b)(4)(B), (D) (2012) (prohibiting discrimination based on an individual's present or predicted disability).

146. See generally Amy B. Monahana, *Fairness Versus Welfare in Health Insurance Content Regulation*, 2012 U. ILL. L. REV 139, 146 (states have on average eighteen mandated health benefits and the 1974 federal Employee Retirement Income Security Act ("ERISA") mandates four, including minimum hospital stays following childbirth and a limitation of the exclusion of preexisting conditions).

147. *Id.* at 149.

148. It is estimated that some 30-40% of hospitals do not permit VBACs. Cristen Pascuci, *Vaginal Birth Bans in America: The Insanity of Mandatory Surgery* (Apr. 14, 2014), improvingbirth.org/2014/04/bans (reporting that over 40% of hospitals do not allow VBACs); see DeNoon, *supra* note 98 (reporting that 30% of hospitals stopped offering VBACs after the release of the 1999 ACOG guidelines, which restricted the practice in light of liability concerns).

149. Monahana, *supra* note 146, at 149.

2. *A C-Section Surcharge on Medical Malpractice Insurance*

In addition or in the alternative, steps should be taken to counteract the ability of medical malpractice insurers to shift the cost of C-sections they deem desirable from a reduction-of-liability-exposure perspective to Medicaid, private health insurers, and patients. Medical malpractice insurance carriers are adding to healthcare insurers' and Medicaid costs by encouraging C-sections where they are not medically necessary. Vaginal delivery, for example, can safely be accomplished 60–80% of the time following a C-section.¹⁵⁰ By 2009, however, 92% of women who had a C-section would deliver by C-section for a subsequent birth.¹⁵¹

Before the Affordable Care Act prohibited exclusions for pre-existing medical conditions, many private health insurance companies would refuse to offer individual coverage to women with a prior C-section because it substantially increased the likelihood of a subsequent C-section, which would create additional expense for the health insurance company.¹⁵² Other health insurance companies would cover women with a prior C-section but only for an increased premium.¹⁵³ Blue Cross Blue Shield of Florida, for example, charged 25% more to insure women with prior C-sections.¹⁵⁴ If Congress repeals the Affordable Care Act's prohibition on pre-existing conditions exclusions, women with a prior C-section will likely face these exclusions or increased premiums again.

At a minimum, medical malpractice insurance carriers should not be permitted to shift to health insurance carriers, Medicaid, and patients the cost of C-sections that they consider advisable from a legal perspective that are not necessary from a medical perspective. Public policy should discourage those insurance practices that contribute to our C-section epidemic with its harmful health and economic consequences. A surcharge or fee could be imposed on malpractice carriers whose physicians or hospitals collectively have C-section rates above a certain percentage of deliveries. That rate would have to be set, but, again, a threshold of around 25% would seem defensible given that the nation easily achieved a 25% C-section rate as recently as 2001.¹⁵⁵ The percent threshold could be adjusted upward for those that insure practices or hospitals with a disproportionately high rate of high-risk patients. The surcharge or fee would provide an economic disincentive for malpractice insurance companies to directly or indirectly encourage physicians to perform C-sections. It would thereby help obstetricians who experience unwanted pressure from malpractice carriers to perform C-sections.

In the alternative, such surcharge or fee could be levied directly on the malpractice policies of obstetric practices and hospitals whose C-section rate exceeds the set percentage of deliveries. Again, the percent threshold could be

150. Grady, *New Guidelines*, *supra* note 100, at A1.

151. Barber et al., *supra* note 42, at 31.

152. Denise Grady, *After Cesareans, Some See Higher Insurance Cost*, N.Y. TIMES (June 1, 2008), <http://www.nytimes.com/2008/06/01/health/01insure.html>; *see also*, Morris, *supra* note 3, at 15.

153. Grady, *After Cesareans*, *supra* note 152.

154. *Id.*

155. Menacker & Hamilton, *supra* note 34.

adjusted upward for those practices or hospitals with a disproportionately high rate of high-risk patients. This approach would place the economic pressure more directly on the physicians and hospitals themselves, making these providers more aware of and responsible for the increased medical costs occasioned by unnecessary C-sections. It could help counteract the current obstetric culture where many obstetricians feel justified in performing C-sections for so-called “medico-legal” reasons. As a national expert on the use of C-sections explained, “right now it is okay [for an obstetrician] to say I did a C-section to reduce liability. Clinicians boldly say, I have to protect myself.”¹⁵⁶ Indeed, the ACOG 1999 guidelines that discouraged VBACs were heavily and expressly motivated by a desire to reduce malpractice exposure rather than based on empirical medical evidence that VBACs were safer for women and babies than repeat cesareans.¹⁵⁷

Both approaches would require malpractice insurers or those that they insure to internalize the cost (or negative economic externalities) of C-sections performed to reduce malpractice exposure. The proceeds of the C-section surcharge or fee could help reimburse state Medicaid programs and private health insurance companies for health expenditures incurred for the medically unnecessary C-sections.

C. *Mandating Disclosure of Hospitals’ and Physicians’ C-Section Rates*

Patients, whose bodies and lives are at issue, are entitled to basic transparency on the C-section practices of a hospital and of a doctor before they select their healthcare provider. At present, only two states, Massachusetts and New York, require hospitals to disclose their C-section rates to the public.¹⁵⁸ No state requires physicians to do so.¹⁵⁹ We, like several others, recommend that states mandate that hospitals and physicians disclose their C-section rates.¹⁶⁰ In addition, we recommend that the federal CMS include C-section rates among its publicly reported quality-of-care measures. This recommendation dovetails with our earlier recommendation that the federal government include C-section rates in Medicare performance-based initiatives. CMS publicly reports quality-of-care measures at more than 4,000 Medicare-certified hospitals.¹⁶¹ Including C-section rates in this federal reporting initiative would provide an easy and efficient way to make hospital C-section rates available to the public.

Public disclosure of C-section rates has two major benefits. First, it facilitates patient prior informed consent. Given the variation in C-section rates among physicians and hospitals and the fact that nonmedical factors affect whether a woman receives a C-section, “sunshine” laws would help patients make informed decisions when selecting a physician and a hospital. C-section

156. Interview with national expert on C-section epidemic, *supra* note 103.

157. Chalidze, *supra* note 8, at 82–83; Myers, *supra* note 30, at 539.

158. MORRIS, *supra* note 2, at 155.

159. *Id.*

160. *Id.* at 160; Chalidze, *supra* note 30, at 96–97, 101–102.

161. James, *supra* note 116, at 4; *Veterans Health Administration Hospital Performance Data*, CTR. FOR MEDICARE & MEDICAID SERVS., <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/VA-Data.html> (last visited Sept. 14, 2017).

rate information would also help patients make more informed decisions on whether to consent to a C-section, helping counteract the current regime of information asymmetry that exists between healthcare provider and patient. Armed with information about C-section rates, patients could, for example, better question whether the procedure is truly necessary or is being performed as a matter of hospital preference or policy. Second, public disclosure of C-section rates might also help reduce the C-section rate by shaming those who overuse C-sections and potentially encouraging them to consider ways to reduce their rates.

Several national groups have taken steps to gather hospital C-section rates, and some hospitals disclose those rates. While promising, these steps are woefully inadequate. As revealed below, these efforts either cover only a few hospitals or fail to disclose the results to patients or to the public. An examination of the current C-section disclosure landscape follows.

Hospitals receive accreditation from an independent, nonprofit organization called the Joint Commission (“JC”).¹⁶² In an effort to decrease the C-section rate, on January 1, 2014, the JC began requiring hospitals with more than 1,100 births per year to report their C-section rates as part of the JC’s accreditation requirements.¹⁶³ Last year, the JC expanded this requirement to hospitals with 300 or more births per year.¹⁶⁴ More than 80% of JC-accredited hospitals with birthing units now fall subject to this reporting requirement.¹⁶⁵ Thus, the JC has C-section rates for most hospitals with birthing units.¹⁶⁶ Unfortunately, it does not make this information public.

Three groups, however, do publish information on some hospitals’ C-section rates. The nonprofit Leapfrog Group publishes an annual hospital survey that discloses, among other things, responding hospitals’ C-section rates.¹⁶⁷ Hospitals participate in the survey on a voluntary basis. For the year 2015, 1,122 hospitals reported their C-section rates.¹⁶⁸ The Leapfrog Group provides this information on its website, searchable by hospital and region.¹⁶⁹

162. *Facts About The Joint Commission*, JOINT COMM’N (Jul. 29, 2015), https://www.jointcommission.org/facts_about_the_joint_commission/. The Joint Commission was formerly known as JCAHO, or the Joint Commission on Accreditation of Healthcare Organizations.

163. *U.S. Hospitals Held Accountable for C-Section Rates*, IMPROVING BIRTH (Jan. 23, 2013), <https://improvingbirth.org/2013/01/u-s-hospitals-held-accountable-for-c-section-rates/>; *Specifications Manual for Joint Commission National Quality Measures: Perinatal Care*, JOINT COMM’N, <https://manual.jointcommission.org/releases/TJC2013B/PerinatalCare.html> (last visited Oct. 9, 2017).

164. *Performance Measurement*, JOINT COMM’N (June 24, 2015), <https://www.jointcommission.org/issues/article.aspx?Article=A9Im9xfNbBo97ZcgWQAj%2FSE%2BKRiZJsPtdFLyHUR1bZU%3D>.

165. *Id.*

166. The JC accredits approximately 77% of hospitals in the United States. *Facts About Hospital Accreditation*, JOINT COMM’N (Jan. 24, 2017), https://www.jointcommission.org/facts_about_hospital_accreditation/.

167. *Factsheet: Maternity Care*, LEAPFROG GRP. (Apr. 1, 2016), <http://www.leapfroggroup.org/sites/default/files/Files/Maternity%20Care%20Fact%20Sheet.pdf>; e.g., *Results of the 2014 Leapfrog Group Hospital Survey: Maternity Care*, LEAPFROG GRP., http://www.leapfroggroup.org/sites/default/files/Files/2014LeapfrogReport_MaternityCareFINAL.pdf (last visited Oct. 9, 2017).

168. *First-Ever National Release of Cesarean Section Rates by Hospital Finds more than 60 Percent of Reporting Hospitals Have Excessive Rates*, LEAPFROG GRP. (Oct. 7, 2015), <http://www.leapfroggroup.org/news-events/first-ever-national-release-cesarean-section-rates-hospital-finds-more-60-percent>; *Rate of C-Sections*, LEAPFROG GRP., <http://www.leapfroggroup.org/ratings-reports/rate-c-sections> (last visited May 18, 2016).

169. *Compare Hospitals*, LEAPFROG GRP., <http://www.leapfroggroup.org/compare-hospitals> (last visited May 18, 2016).

A website called CesareanRates.com also provides information on hospital C-section rates.¹⁷⁰ CesareanRate.com collects data from state departments of health or from state hospital associations.¹⁷¹ Many states, however, do not disseminate hospital C-section rates or any data that could be used to calculate such rates.¹⁷²

On April 13, 2016, Consumer Reports released its ratings for more than 1,200 hospitals based on their C-section rates for low-risk births.¹⁷³ The ratings only applied to situations where all of the following four facts were present: first-time mothers, delivering single babies, in proper position, and at term.¹⁷⁴ Consumer Reports based its ratings on data gathered from either the Leapfrog Group or the California Maternal Quality Care Collaborative.¹⁷⁵ Consumer Reports found that almost half of the C-sections occurred when babies could have been safely delivered vaginally.¹⁷⁶ It concluded that the biggest risk in having a C-section “may simply be which “hospital a mother walks into to deliver her baby”¹⁷⁷

Both the Leapfrog Group survey and Consumer Reports reflect the limits of voluntary reporting. The surveys fail to cover more than half of the estimated 3,000 hospitals that deliver babies.¹⁷⁸ Both surveys showed wide variation between hospitals. For example, in one major East Coast metropolitan area, the C-section rate ranged from 10% to 54%.¹⁷⁹

While patients can access some information about hospital C-section rates, virtually no information is available on the C-section rates of individual physicians or physician groups. The state of Virginia serves as an exception. Virginia, through a non-profit organization, collects physician-specific C-section rates¹⁸⁰ as part of its *Obstetrics Care Guide*.¹⁸¹ The *Guide* reports physician-observed rates of cesarean section along with an indication of whether the observed rates are higher, lower, or not statistically distinguishable from what would be expected. The *Guide* separately reports the rates for women without a prior cesarean section and those for women who have had a prior cesarean delivery.¹⁸² The Virginia approach serves as a helpful model for other states.

170. *What Is My Hospital's Cesarean Rate?*, CESAREANRATES.COM, <http://www.cesareanrates.com/2015/01/what-is-my-hospitals-cesarean-rate.html> (last visited Sept. 16, 2017).

171. *About*, CESAREANRATES.COM, <http://www.cesareanrates.com/p/about-site.html> (last visited Sept. 16, 2017).

172. *What Is My Hospital's Cesarean Rate?*, *supra* note 170.

173. Haelle, *supra* note 125.

174. *Id.*

175. *Id.*

176. *Id.*

177. *Id.*

178. *Id.*

179. *Maternity Care Varies Dramatically Across the Country*, LEAPFROG GRP. (May 5, 2016), <http://www.leapfroggroup.org/news-events/maternity-care-varies-dramatically-across-country>.

180. *Virginia's Obstetric Hospitals and Physicians*, VA. HEALTH INFO, http://www.vhi.org/obstetrics_compare.asp (last visited Oct. 9, 2017).

181. *Are You Having a Baby?*, VA. HEALTH INFO, http://www.vhi.org/ob_guide/ob_intro.asp (last visited Oct. 9, 2017).

182. *Obstetrics Care Guide Technical Manual*, U. VA. DEP'T HEALTH EVALUATION SCIS. & VA. HEALTH INFO. (2009), http://www.vhi.org/pdf/2009OB_Tech_Manual.pdf (last visited Oct. 9, 2017).

In addition to providing important information to patients, disclosure of hospital and physician C-section rates can help lower that rate by making hospitals and physicians aware of how their C-section rates compare to others and by shaming those with high rates. One hospital, for example, reduced its higher-than-average C-section rate of 38% to about 33% of all births, and to about a quarter of all low-risk births, in three years, partly by obtaining and reporting to all physicians each doctor's C-section rate.¹⁸³ "There was a lot of upheaval," said Jeffrey Illeck, chair of the hospital's obstetrics department.¹⁸⁴ "None of us want to look bad in front of our peers. And some looked horrible."¹⁸⁵ Public disclosure of hospital performance in other areas, such as efforts to reduce patient mortality from pneumonia or congestive heart failure, has seemingly improved hospital performance.¹⁸⁶ As James reports, "hospitals worried about being publicly 'shamed' if they displayed poor performance . . . endeavored to close the quality gap."¹⁸⁷

V. CONCLUSION

Unnecessary cesarean sections harm both women and children. They engender billions of dollars in extra costs for taxpayers and for health insurers and their insureds. While not addressed in this Article, C-sections performed for economic or liability avoidance reasons present serious moral issues.¹⁸⁸

This Article shows that the commonly advocated remedy for our nation's C-section epidemic—damage caps on malpractice liability—do not reduce cesarean rates. Although about half the states in the Union have had non-economic damage caps in place for at least eight years, our aggregate data shows that women are just as likely to give birth by cesarean section in states with damage caps as in ones without such caps. Overall, we found that women who gave birth in states with damage caps had a 33% chance of having a C-section. Women who gave birth in states without caps had a 32% chance of delivering by C-section. There is no statistical difference in these rates. Moreover, damage caps have not slowed the rate of increase in C-section rates. States with damage caps and those without had no statistically different rate of change in their cesarean rates.

Given that damage caps do not affect C-section rates, other legal levers should be considered if we are to reduce our nation's exorbitant resort to cesarean delivery. To that end, we advocate three possible avenues of reform. First, contrary to the present norm, we recommend that obstetricians receive more,

183. *How One Hospital Brought Its C-Section Rate Down Fast*, U.S. NEWS (May 9, 2015, 12:01 AM), <http://health.usnews.com/health-news/hospital-of-tomorrow/articles/2015/05/09/how-one-hospital-brought-its-c-section-rate-down-fast>.

184. *Id.*

185. *Id.*

186. James, *supra* note 116, at 4.

187. *Id.*

188. See generally Tina Rosenberg, *Reducing Unnecessary C-Section Births*, N.Y. TIMES (Jan. 19, 2016), <https://opinionator.blogs.nytimes.com/2016/01/19/arsdarian-cutting-the-number-of-c-section-births/?mcubz=0> (discussing how the increased cost of C-sections and the potential for malpractice liability influence doctors to perform C-sections).

rather than less, to deliver vaginally to compensate them for the extra time that vaginal delivery takes over cesarean delivery. We further propose that recent federal and state pay-for-performance programs include appropriate cesarean rates among the measures used to reward hospitals and physicians for quality of healthcare. Second, rather than looking to tort reform to reduce C-section rates, policy-makers should take steps to mitigate malpractice insurer practices that encourage C-sections. We propose two novel measures to do so. Finally, we join others in calling for mandatory public disclosure by hospitals and physicians of their cesarean section rates so that patients can make more informed decisions when choosing their healthcare providers.

APPENDIX

Table I- 2007

State	C-Section Rate	Total Births	C-Section Births	Damage Cap
Alaska	22.60%	11,052	2,498	Yes
California	32.10%	566,414	181,818	Yes
Colorado	25.80%	70,809	18,269	Yes
Florida	37.20%	239,165	88,969	Yes
Georgia	32.10%	151,137	48,515	Yes
Hawaii	26.40%	19,134	5,051	Yes
Idaho	24.00%	25,019	6,005	Yes
Illinois	30.30%	180,836	54,793	Yes
Indiana	29.40%	89,864	26,420	Yes
Kansas	29.80%	42,004	12,517	Yes
Louisiana	36.00%	66,301	23,868	Yes
Maryland	33.10%	78,095	25,849	Yes
Massachusetts	33.50%	77,967	26,119	Yes
Michigan	30.70%	125,261	38,455	Yes
Mississippi	36.20%	46,491	16,830	Yes
Missouri	30.30%	81,930	24,825	Yes
Montana	29.40%	12,439	3,657	Yes
Nevada	33.10%	41,181	13,631	Yes
New Mexico	23.20%	30,616	7,103	Yes
North Dakota	28.40%	8,840	2,511	Yes
Ohio	29.80%	150,879	44,962	Yes
Oklahoma	33.60%	55,065	18,502	Yes
South Carolina	33.50%	62,875	21,063	Yes
South Dakota	26.60%	12,261	3,261	Yes
Texas	33.70%	407,625	137,370	Yes
Utah	22.20%	55,130	12,239	Yes
Virginia	33.50%	108,884	36,476	Yes
West Virginia	35.20%	21,994	7,742	Yes

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Connecticut	34.60%	41,660	14,414	No
New Jersey	38.30%	116,063	44,452	No
Pennsylvania	30.10%	150,713	45,365	No
Alabama	33.80%	64,804	21,904	No
Arizona	26.20%	102,981	26,981	No
Arkansas	34.80%	41,378	14,400	No
Delaware	32.10%	12,170	3,907	No
DC	32.60%	8,864	2,890	No
Iowa	29.40%	40,886	12,020	No
Kentucky	34.70%	59,368	20,601	No
Maine	30.00%	14,120	4,236	No
Minnesota	26.20%	73,735	19,319	No
Nebraska	30.90%	26,934	8,323	No
New Hampshire	30.80%	14,168	4,364	No
New York	33.70%	253,451	85,413	No
North Carolina	30.70%	131,037	40,228	No
Oregon	28.20%	49,378	13,925	No
Rhode Island	32.20%	12,376	3,985	No
Tennessee	33.30%	86,711	28,875	No
Vermont	26.80%	6,513	1,745	No
Washington	29.00%	88,978	25,804	No
Wisconsin	25.00%	72,784	18,196	No
Wyoming	26.90%	7,893	2,123	No

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Table II- 2013

State	CS Rate	Total Births	CS Births	% Change 07 - 13	Damage Cap
Alaska	24.00%	11,446	2,747	1.40	Yes
California	33.20%	494,705	164,242	1.10	Yes
Colorado	26.00%	65,007	16,902	0.20	Yes
Florida	37.70%	215,407	81,208	0.50	Yes
Hawaii	25.20%	18,987	4,785	-1.20	Yes
Idaho	24.90%	22,383	5,573	0.90	Yes
Indiana	30.50%	83,102	25,346	1.10	Yes
Kansas	30.20%	38,839	11,729	0.40	Yes
Louisiana	38.90%	63,201	24,585	2.90	Yes
Maryland	31.50%	71,953	22,665	-1.60	Yes
Massachusetts	31.50%	71,788	22,613	-2.00	Yes
Michigan	32.60%	113,489	36,997	1.90	Yes
Mississippi	38.50%	38,634	14,874	2.30	Yes
Missouri	31.10%	75,296	23,417	0.80	Yes
Montana	29.70%	12,377	3,676	0.30	Yes
Nevada	34.90%	35,030	12,225	1.80	Yes
New Mexico	24.30%	26,354	6,404	1.10	Yes
North Dakota	28.90%	10,599	3,063	0.50	Yes
Ohio	31.10%	138,936	43,209	1.30	Yes
Oklahoma	33.80%	53,369	18,039	0.20	Yes
South Carolina	35.00%	56,795	19,878	1.50	Yes
South Dakota	25.50%	12,248	3,123	-1.10	Yes
Texas	35.20%	387,340	136,344	1.50	Yes
Utah	22.40%	50,957	11,414	0.20	Yes
Virginia	33.70%	102,147	34,424	0.20	Yes
West Virginia	35.90%	20,825	7,476	0.70	Yes
North Carolina	30.40%	119,002	36,177	-0.30	Yes as of 2012
Georgia	34.20%	128,748	44,032	2.10	No as of 2010
Illinois	31.70%	156,931	49,747	1.40	No as of 2010
Connecticut	34.80%	36,085	12,558	0.20	No
New Jersey	38.40%	102,575	39,389	0.10	No
Pennsylvania	31.30%	140,921	44,108	1.20	No
Alabama	35.80%	58,167	20,824	2.00	No
Arizona	27.40%	85,600	23,454	1.20	No
Arkansas	34.40%	37,832	13,014	-0.40	No

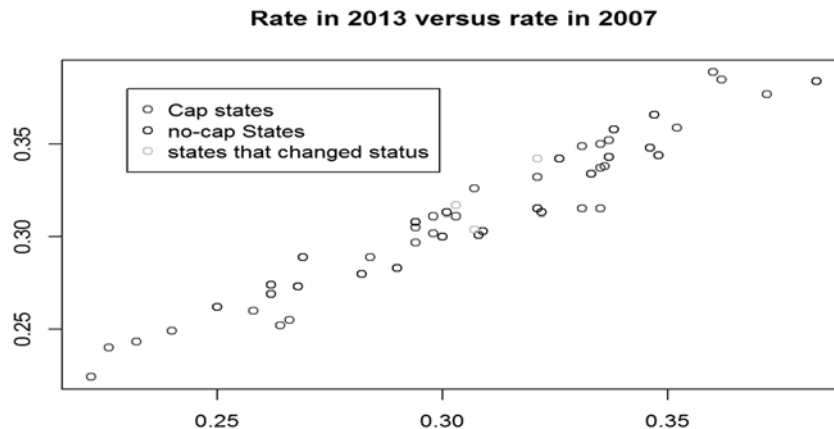
Delaware	31.50%	10,831	3,416	0.60	No
DC	34.20%	9,288	3,176	1.60	No
Iowa	30.80%	39,094	12,041	1.40	No
Kentucky	36.60%	55,686	20,381	1.90	No
Maine	30.00%	12,776	3,833	0.00	No
Minnesota	26.90%	69,159	18,609	0.40	No
Nebraska	30.30%	26,095	7,907	-0.60	No
New Hampshire	30.10%	12,396	3,731	-0.70	No
New York	34.30%	236,980	81,284	0.60	No
Oregon	28.00%	45,155	12,643	-0.20	No
Rhode Island	31.30%	10,809	3,985	0.10	No
Tennessee	33.40%	79,992	26,717	0.10	No
Vermont	27.30%	5,975	1,631	0.50	No
Washington	28.30%	86,577	24,501	-0.70	No
Wisconsin	26.20%	66,649	17,462	1.20	No
Wyoming	28.90%	7,644	2,209	2.00	No

Number of births by state obtained from U.S. Departments of HHS, CDC, National Center for Health Statistics, “Births Final Data for 2013,” National Vital Statistics Report, Vol. 64, Table I at p. 61 (January 15, 2015). C-section rates by state obtained from *id.*, Table I-7. Damage Cap by state information obtained from McCullough, Campbell, and Lane, “Medical Malpractice Summary Index of States,” available at www.mccandl.com/states.html (last checked Oct. 18, 2015).

Statistical Analysis

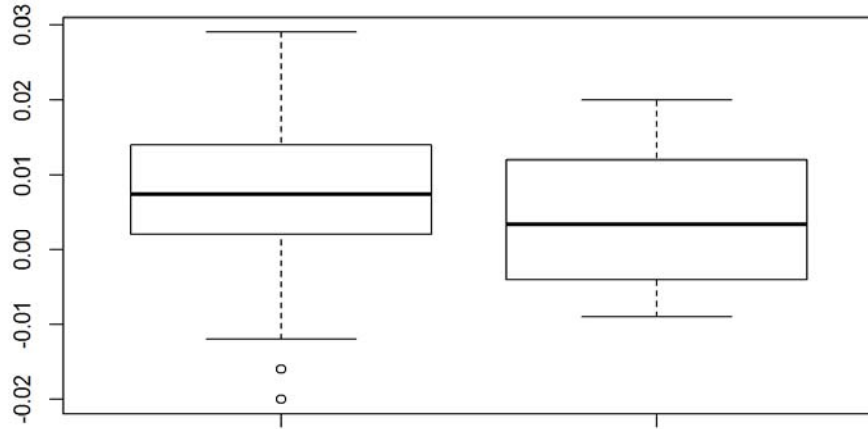
Damage Caps and C-Section

For each state, the damage caps status and C-section rate in 2007 and in 2013. The scatter plot and boxplots suggest that the median rate and rate difference is similar for cap and no-cap states (the spread in rates is slightly greater for cap states).

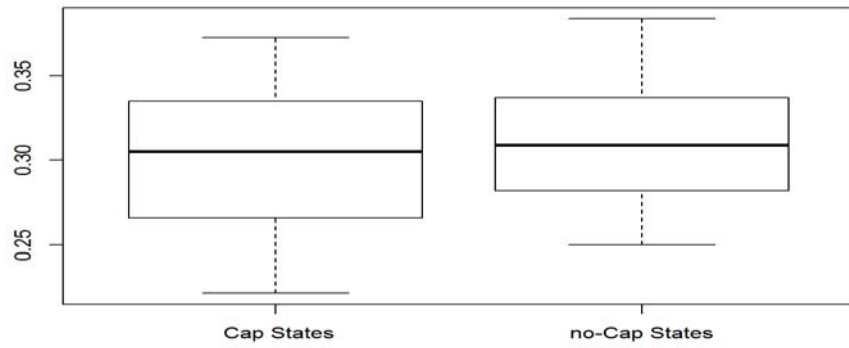




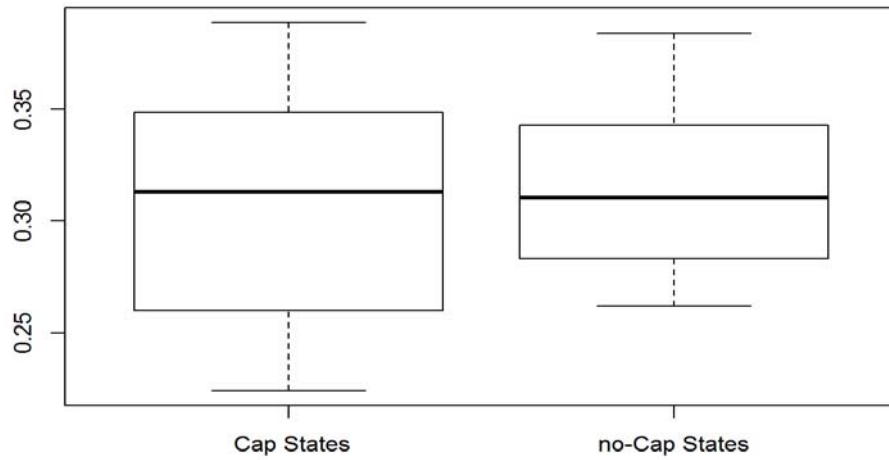
c-section rate difference 2013-2007



c-section rate in 2007



c-section rate in 2013



To answer the question whether there is a difference between cap and no-cap states in the rates in 2007, in the rates in 2013, or in the difference from 2007 to 2013, let's use Wilcoxon's rank sum test (also known as the Mann-Whitney test). I exclude the three states that changed their cap status from 2007 to 2013.

The p-values are large, so there is not enough evidence that the rates in 2007, in 2013, or the difference in rates from 2007 to 2013, differ between cap and no-cap states. We did not reject the null hypothesis that the rate distribution is the same across cap and non-cap states, or more precisely we did not reject the null hypothesis that the probability that a cap-state has a greater rate than a non-cap state is half.