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RESEARCH ARTICLE

The Impact of Malpractice Liability Claims on Obstetrical Practice Patterns

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Objectives. This paper examines whether malpractice claims have any impact on obstetrical practice patterns (C-section rates) and physician delivery volume.
Data Sources. Secondary data from the 1992–2000 Florida Hospital Inpatient Discharge File, the Florida Medical Professional Liability Insurance Claims File, and the American Medical Association's Master File on physician characteristics.
Study Design. The effects of malpractice claims on C-section rates and physician delivery volume were estimated using panel data and a fixed-effects multivariate model.
Data Collection. Variables were constructed from each data source and merged into a single panel dataset using consistent physician identifiers.
Principal Findings. I did not find evidence that physicians changed their practice patterns by increasing C-section rates in response to malpractice claims. However, physicians performed six fewer inpatient deliveries 3 years after the closing of a malpractice claim, after controlling for individual- and market-level characteristics. Physicians with high malpractice awards of U.S.$250,000 or more performed 14 fewer deliveries on average.
Conclusions. Malpractice claims led to a small reduction in physician delivery volume, but they did not have a significant impact on C-section rates.

Key Words. Malpractice claims, access to care, practice patterns, C-section rates

Since the late 1960s, a dramatic rise in malpractice insurance premiums has sparked both debate and concern among physicians and health policy makers that access to care may be limited by physicians who no longer practice certain types of procedures (Studdert, Mello, and Brennan 2004). In March 2005, the American Medical Association identified 20 states in full-blown medical liability crisis due to rising medical malpractice premiums. In response, many state legislatures have attempted to pass malpractice reform bills to limit noneconomic damages awarded in lawsuits or attempted to regulate premiums. Obstetrics provides a useful context for analysis because many claims are associated with birthing deliveries and the volume of deliveries is not subject to physician-induced demand (American College of Obstetricians and

Gynecologists 2004). A central question of interest to policy makers is to what extent do malpractice claims have an adverse impact on obstetrical delivery volume, practice patterns (C-section rates), and access to care.

Previous studies on the impact of malpractice pressure on C-section rates yielded mixed results. Tussing and Wojtowycz (1992) reported that higher malpractice premiums decreased the probability of a cesarean delivery. Sloan et al. (1997) found no significant effect of perceived risk on the likelihood of having a cesarean delivery; however, Localio et al. (1993) found that higher malpractice risk increased the probability of a cesarean delivery. A limitation of these early analyses was the use of a single year of data. Using a more rigorous framework with multiple years of data, Dubay, Kaestner, and Waidmann (1999) analyzed the impact of average malpractice premiums on cesarean rates. Using birth certificate data from 1990 through 1992 to conduct a county fixed-effects analysis, they found a small, positive relationship between malpractice pressure and higher risk-adjusted C-section rates. Using panel data, Grant and McInnes (2004) also found that physicians with malpractice claims increased their risk-adjusted C-section rate by a small amount.[1]

Recent studies on the impact of malpractice pressure on physician supply have found small or no effects. Baicker and Chandra (2005) did not find any significant association between overall physician supply and higher malpractice premiums or total claim payments at the state level. Using tort reform as an exogenous source of variation in their studies of physician supply, Kessler, Sage, and Becker (2005) found that direct reforms (e.g., damage caps) were associated with 3 percent higher growth in physician supply after 3 years, but this growth was primarily due to retirements and entries rather than interstate relocations. Dranove and Gron (2005) used Florida hospital discharge data to compare the period from 1997 to 2000 with 2000 to 2003 to see whether travel times for high-risk deliveries changed. They concluded that women undergoing high-risk deliveries did not see increases in travel times. Therefore, access to obstetrical care was not compromised from 1997 to 2000 compared with 2000 to 2003. This analysis of individual-level claims in Florida extends these prior studies by providing evidence on whether a change in practice patterns and delivery volume is affected by the timing of a claim and award size.

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This study examines whether malpractice claims have any impact on obstetrical practice patterns, after accounting for the award size of claims. A panel dataset and a fixed-effects model framework allow for the control of unobservable, time-invariant physician characteristics. Also, this study explores whether the timing of a malpractice claim matters, by using multiple fields for the incident occurrence date, filing date, and closing date of each claim. Do physicians react immediately after an incident, before a claim is filed? Or is a response more likely to occur after a malpractice claim is closed and revealed to the public? Evidence that affirms the first question may point toward a physician-led, supply-side response. However, evidence in support of the latter question may indicate either a supply-side response in which physicians avoid certain high-risk patients to reduce the likelihood of future claims or a possible demand-side response where the loss of a physician's reputation influences patient choice. Finally, by including the award value of claims in the study's findings, it will be possible to draw policy implications regarding the likely effect of award caps, a central feature in tort reform legislation.

Provider Response to Malpractice Claims

One important rationale for the tort system is its ability to deter negligent care. But how would the risk of a malpractice claim actually change physician behavior? In the short run, a supply-side response may occur in which a physician's practice patterns change. Standard models assume that risk-averse physicians maximize expected utility over two possible states—one with a claim and the other without a claim (Quinn 1998). A malpractice claim has the effect of increasing a physician's risk of incurring a future malpractice claim (Kington 1991). However, the predicted impact on the volume of deliveries is ambiguous because of two competing effects. On the one hand, an income effect would cause the physician to increase patient volume to make up for the loss of wealth due to higher premiums (Pauly et al. 2006). On the other hand, a fear effect arises because the risk of a future claim resulting in a loss of reputation is higher.

Alternatively, a malpractice claim may have no effect on physician behavior. Malpractice premiums for physicians are not experience-rated based on prior claims history, but are adjusted by the individual physician's geographic location, specialty, and coverage limits (Danzon 1991). However, even though physicians are insulated from the financial cost of a paid claim,

they are exposed to reputation loss and the time and unpleasantness of defending a claim, which represent uninsured costs (Danzon 2000). Also, multiple claims can lead to the dropping of renewals for existing insurance policies, sanctions by a state medical board, or the suspension of hospital admitting privileges. Premiums may increase for physicians forced to find a new insurer. In response to these uninsured costs, a physician might adopt a more cautious approach to reduce the risk of a future claim by reducing delivery volume or shifting toward safer procedures (increased C-section rates).

A demand-side response can occur in the long run if the closing of a claim results in an award or settlement that is widely publicized and diminishes patient demand. However, changes in practice patterns are likely to be due to a physician's own response. Therefore, we might expect to observe a higher C-section rate, but the impact on delivery volume will depend on the relative size of the income effect, which predicts more deliveries and the fear effect, which predicts fewer deliveries.

Study Data and Methods

Data

The primary data source used for constructing the sample is the Florida Hospital Inpatient Discharge File for the years 1992–2000. This administrative dataset contains information on 1.2 million deliveries that occurred at nonfederal, short-term acute care hospitals in the state of Florida. For each year, I extracted information on patient demographics (age, race, and ethnicity), insurance coverage (HMO, Medicaid), as well as ICD-9 diagnostic and DRG procedure codes for whether a baby was delivered by C-section or vaginally. A unique and consistent physician identifier was used to count hospital discharge records for each individual physician by year. By aggregating patient discharge data for each physician, all data cells were transformed from a per patient-discharge unit of observation to a physician-year unit of observation. The final sample contains 1,772 physicians representing 10,100 total physician-year observations.

The administrative dataset was merged with the Florida Medical Professional Liability Insurance Claims File using unique physician identifiers. *SAS* version 9.1 was used to read, clean, and merge all raw data files. The claims dataset provided a history of all reported medical malpractice claims, award amounts, severity of injury, and incident, filing, and closing dates across

the years 1992–2000. The sample includes paid or resolved claims that reach a decision through settlement or verdict, but it excludes dropped or pending claims that have not yet closed. State law mandates that all malpractice insurers, including joint underwriting associations, report their claims to the Department of Insurance and Financial Services within 60 days of closing.

One advantage of the multiple dates for the incident, opening, and closing of a claim is the ability to determine whether the timing of a claim matters. Given the mean time lag of 1.2 years between the incident and filing dates of a claim, and a mean lag of 2.4 years between the filing and closing dates, it is possible to determine which stages of a malpractice claim have the greatest impact on physician behavior.[2] If physician behavior is sensitive to the injury that led to the claim, then one might expect to see an effect for the incident date of a claim. However, if the resolution of a claim prompts a change in behavior, then the closing date might have more influence. Table 1 shows the distribution of all claims by physician by year. From 1992 to 2000, the majority of physicians (57–69 percent) did not have any claims, but other physicians had one or two claims (24–33 percent), three of four claims (6–9 percent), or five or six claims (< 1 percent).

Physician characteristics were obtained from the American Medical Association's Physician Master File. Fields include a physician's birth date, medical school graduation date, gender, specialty, board certification status, county of residence, and whether the physician was dead or living. Observations with missing physician license numbers were excluded. As shown in Table 1, the number of obstetrician–gynecologists increased over this time and represented more than 93 percent of physicians who performed inpatient deliveries. Family practitioners and maternal fetal-medicine specialists each represented only 2–3 percent of physicians.

Following the sample selection criteria of Grant and McInnes (2004), I included all obstetricians, maternal–fetal medicine specialists, and family practitioners that performed at least 10 births in each year. Because the individual C-section rate is a ratio with the number of deliveries in the denominator, a minimum restriction of 10 deliveries removes extreme outlier values. The sample excludes active physicians who are older than 75 years of age (3 standard deviations above the mean), nurses, midwives, and resident physicians.

Study Variables

The two dependent variables (delivery volume, C-section rate) were constructed in the following way. First, the delivery volume variable in each year

Table 1: Distribution of Physicians by Specialty and Claims, 1992–2000

	1992	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*
Obstetrician/gynecologists	883	947	966	1,007	1,012	1,149	1,165	1,163	1,151
Family practice	23	32	31	29	26	24	28	38	34
Maternal–fetal medicine	16	18	20	21	22	26	25	22	24
All other	24	23	23	28	23	24	22	17	24
Total physicians	946	1,020	1,040	1,085	1,083	1,223	1,240	1,240	1,233
0 claims	547	577	590	632	657	771	805	833	855
1–2 claims	311	339	349	354	335	353	341	321	297
3–4 claims	80	94	92	90	82	91	86	79	74
5–6 claims	8	10	9	9	9	8	8	7	7
Total physicians	946	1,020	1,040	1,085	1,083	1,223	1,240	1,240	1,233

is the count of all inpatient deliveries under DRG codes 370, 371, 372, and 373 for each physician-year cell. However, births in outpatient settings such as birthing centers, or in the home, were excluded from the sample. Nonbirthing obstetrical procedures, such as a hysterectomy, were also excluded.

Key explanatory claim variables were defined in the following way. For the closed claim variable, a binary indicator was used to designate whether a claim was resolved in a prior year. Similarly, the incident and open variables use binary indicators. In a given year, a malpractice claim is a relatively rare event (6–7 percent of observations). However, if we aggregate all years in the sample, roughly one in three physicians who performed inpatient deliveries encountered at least one birth-related malpractice claim in Florida between 1992 and 2000.

In accordance with risk-adjustment methods from previous studies, I used ICD-9 codes to classify patients with complex comorbidities and control for clinical risk factors that increase the likelihood of a C-section (Gregory et al. 2002). Examples of clinical risk factors include whether a woman had a prior C-section, breech position of the fetus, premature labor, patient's age is 40 years or older, antepartum hemorrhage, hypertension, premature labor, multiple gestation (i.e., twins), soft tissue disorder, macrosomia (i.e., big baby), oligohydramnios or polyhydramnios (i.e., irregular amniotic fluid levels), herpes, and diabetes.

Table 2 summarizes the mean and standard deviation of variables in the multivariate analysis. For the average physician's caseload, most patients are white (63 percent), and obtain coverage through a PPO (35 percent), HMO (24 percent), or Medicaid (32 percent). The average number of patient comorbidities across physicians in the sample was 0.28. On average, 2 percent of patients were 40 years of age or older for each physician-year. Finally, 14 percent of patients had a history of a previous C-section.

Statistical Approach

Using the merged panel dataset, I conducted a multivariate, fixed-effects analysis to examine the impact of malpractice claims on C-section rates and delivery volume. Physician fixed effects account for time invariant, unobservable characteristics, such as bedside manner or tone of voice, which influence whether a patient decides to file a claim (Ambady et al. 2002). The fixed-effects model was conducted using the XTREG procedure in Stata (version 9). A key assumption in the model is that current delivery volume and C-section rates do not influence past claims. Year dummies are used to

Table 2: Description of Variables in Multivariate Regression Analysis

All Birth-Related Procedures (DRG 370, 371, 372, 373)

Variable Description	*Mean*	*SD*
Dependent variables		
Delivery volume	121.346	86.462
C-section rate (%)	0.288	0.122
Explanatory claim variables		
Incident occurred	0.052	0.222
Claim opened/filed	0.060	0.238
Claim closed/resolved	0.073	0.260
Award low (U.S.$1 to U.S.$99 k)	0.016	0.125
Award medium (U.S.$100 k to U.S.$249 k)	0.012	0.109
Award high (U.S.$250 k to U.S.$499 k)	0.014	0.117
Award very high (U.S.$500 k+)	0.005	0.070
Minor injury	0.009	0.095
Major injury	0.030	0.172
Grave injury or death	0.016	0.125
Physician characteristic variables		
Age	44.554	8.962
Age (30–39 years)	0.320	0.467
Age (40–49 years)	0.404	0.491
Age (50–75 years)	0.270	0.444
Patient characteristic variables		
White patient (%)	0.625	0.254
Black patient (%)	0.187	0.175
Hispanic patient (%)	0.133	0.187
PPO or indemnity (%)	0.346	0.240
HMO (%)	0.239	0.214
Medicaid (%)	0.317	0.271
Uninsured/self-pay (%)	0.080	0.101
Number of comorbidities	0.278	0.159
% of patients age 40+ years	0.021	0.022
% with prior cesarean ever	0.137	0.061
Number of observations		
Physician-year	10,100	
Physicians	1,772	

account for time trends, such as an increase in the number of women who are of childbearing age. Standard errors were clustered at the physician level to produce estimates that are robust to cross-sectional heteroskedasticity and within-panel serial correlation (Wooldridge 2002).

Average patient characteristics such as age, race, and insurance type are included for all inpatient deliveries performed by each physician within a year. While individual physician characteristics such as board certification and

specialty appear in the descriptive statistics, they are not presented in the fixed-effects model since they are time invariant. Comorbidities are included in the model based on clinical diagnoses. Award levels, which are of interest to policy makers, are included to test whether the size of an award has a separate effect from the claim indicator. Another claim severity measure in the model is the injury code that classifies an injury as minor; major; or grave, including death.

Study Results

For the analysis of practice patterns, Table 3 presents results from the fixed-effects of the impact of malpractice claims on C-section estimation rates. Three sets of columns are presented with results based on the timing of a prior injury occurrence, claim initiation or opening, and claim resolution or closing. Within each set of results, the first column includes lagged indicators for the explanatory claim variables, but it excludes award size and claims severity measures. The second column includes the award size and claim severity measures.

A key null finding is that a prior year incident, claim opening, or claim closing does not have a significant impact on C-section rates overall. As expected, many patient control variables that account for clinical risk are significant and consistent across specifications. For example, physicians with a greater number of patients with comorbidities (30 percent, $p<.01$), patients who are 40 years or older (12 percent, $p<.01$), or patients with a prior cesarean (74 percent, $p<.01$) have significantly higher C-section rates. None of the coefficient estimates for the claim severity variables and award size were significant.

Table 4 shows the impact of malpractice claims on the annual volume of deliveries. Two key findings emerge. First, the closing of a malpractice claim led to six fewer deliveries 3 years after the closing of a claim. This result was significant with and without the claim severity variables. When we included claim severity and award size, we found the decrease in deliveries was more acute for higher awards. Specifically, a high award amount (>U.S.$250,000) led to an additional reduction of 14 deliveries per year, which represents about 11 percent of the average inpatient delivery volume (121 births) per year. Control variables for physician age show that delivery volume increases over time, but at a diminishing rate until a maximum is reached at age 44. Physicians with a greater share of Medicaid patients (78, $p<.01$) and nonwhite

Table 3: The Impact of Malpractice Claims on C-Section Rates: Fixed-Effects Model Results

	Dependent Variable: C-Section Rate					
	Incident Occurrence		*Claim Opening*		*Claim Closing*	
Explanatory claim variables						
Claim variable ($t-1$)	0.468	0.429	0.262	0.181	−0.093	−0.046
Claim variable ($t-2$)	0.204	0.161	−0.068	−0.120	−0.452	−0.414
Claim variable ($t-3$)	0.183	0.153	−0.044	−0.084	−0.083	−0.037
Claim severity						
Award low (U.S.$1 to U.S.$99 k)		0.218		0.244		0.245
Award medium (U.S.$100 k to U.S.$249 k)		−0.050		−0.030		−0.019
Award high (U.S.$250 k to U.S.$499 k)		1.064		1.106		1.134
Award very high (U.S.$500 k+)		0.010		0.044		0.015
Award missing		0.560		0.545		0.577
Minor injury		0.735		0.765		0.757
Major injury		0.866		0.875		0.857
Grave injury or death		0.545		0.535		0.509
Physician characteristics						
Age	−0.940***	−0.946***	−0.913***	−0.917***	−0.904***	−0.918***
Age-squared	−0.005***	−0.005***	−0.005***	−0.005***	−0.005***	−0.005***
Patient characteristic variables						
Black patient (%)	−6.297***	−6.291***	−6.339***	−6.321***	−6.307***	−6.303***
Hispanic patient (%)	2.182**	2.178**	2.159**	2.155**	2.117**	2.124**
PPO or indemnity (%)	−1.265**	−1.294**	−1.261**	−1.288**	−1.243**	−1.276**
Medicaid (%)	−3.579***	−3.581***	−3.578***	−3.583***	−3.575***	−3.579***
Uninsured/self-pay (%)	−5.454***	−5.458***	−5.464***	−5.469***	−5.441***	−5.444***
% comorbidities	29.694***	29.709***	29.687***	29.701***	29.679***	29.698***
% patients >39 years	12.406***	12.514***	12.329***	12.440***	12.389***	12.498***
% previous cesareans	74.416***	74.360***	74.449***	74.392***	74.468***	74.406***

Year dummies						
$t = 1994$	0.200	0.200	0.177	0.180	0.215	0.217
$t = 1995$	1.351	1.335	1.315	1.300	1.351	1.339
$t = 1996$	1.683	1.652	1.611	1.584	1.658	1.636
$t = 1997$	2.808**	2.795**	2.703**	2.694**	2.763**	2.762**
$t = 1998$	4.398***	4.384***	4.261***	4.253***	4.332***	4.337***
$t = 1999$	6.852***	6.860***	6.679***	6.692***	6.740***	6.773***
$t = 2000$	9.239***	9.255***	9.032***	9.051***	9.075***	9.126***
Constant	62.147***	61.738***	61.147***	60.727***	60.920***	60.789***
Number of observations	10,110	10,110	10,110	10,110	10,110	10,110
Number of physicians	1,772	1,772	1,772	1,772	1,772	1,772
R^2 (within)	0.409	0.409	0.409	0.409	0.409	0.409
R^2 (overall)	0.052	0.052	0.054	0.054	0.054	0.054
F-test of overall model fit	287.890	205.750	287.710	205.650	287.820	205.720
	$(p > F) = 0$	$(p > F) = 0$	$(p > F) = 0$	$(p > F) = 0$	$(p > F) = 0$	$(p > F) = 0$

**$p < .05$;

***$p < .01$.

Table 4: The Impact of Malpractice Claims on Annual Deliveries: Fixed-Effects Model Results

	Dependent Variable: Volume of Deliveries					
	Incident Occurrence		*Claim Opening*		*Claim Closing*	
Explanatory claim variables						
Claim variable ($t-1$)	3.884	4.235	0.089	0.179	−0.821	−1.187
Claim variable ($t-2$)	−0.762	−0.590	−0.364	−0.363	−3.097	−3.265
Claim variable ($t-3$)	0.340	0.123	−1.341	−1.159	−5.889**	−6.128**
Claim severity						
Award low (U.S.$1 to U.S.$99 k)		2.211		2.497		2.865
Award medium (U.S.$100 k to U.S.$249 k)		−2.172		−2.108		−1.544
Award high (U.S.$250 k to U.S.$499 k)		−14.934**		−14.261**		−13.647**
Award very high (U.S.$500 k+)		−11.109		−10.994		−10.945
Award missing		−2.658		−2.403		−1.269
Minor injury		−2.823		−2.570		−2.827
Major injury		−1.096		−0.992		−1.556
Grave injury or death		3.621		3.550		3.129
Physician characteristics						
Age	19.646***	19.694***	19.736***	19.764***	19.790***	19.880***
Age-squared	−0.226***	−0.226***	−0.226***	−0.226***	−0.227***	−0.227***
Patient characteristic variables						
Black patient (%)	44.818***	44.677***	44.706***	44.541***	44.835***	44.687***
Hispanic patient (%)	61.899***	61.705***	61.702***	61.538***	60.943***	60.736***
PPO or indemnity (%)	−14.426***	−14.459***	−14.469***	−14.534***	−14.731***	−14.689***
Medicaid (%)	78.187***	78.086***	78.111***	77.987***	78.206***	78.112***
Uninsured/self-pay (%)	28.890***	28.779***	28.702***	28.575***	28.762***	28.679***
% comorbidities	−35.223***	−35.400***	−35.304***	−35.469***	−35.082***	−35.305***
% patients >39 years	−29.791	−30.091	−30.398	−30.528	−29.224	−29.710

Year dummies						
$t = 1994$	−3.819	−3.788	−3.797	−3.770	−3.636	−3.595
$t = 1995$	−5.463	−5.397	−5.477	−5.404	−4.942	−4.819
$t = 1996$	−5.427	−5.190	−5.558	−5.323	−5.006	−4.684
$t = 1997$	12.533	12.619	12.262	12.357	13.007	13.170
$t = 1998$	17.704	17.798	17.313	17.416	18.326	18.439
$t = 1999$	22.655	22.831	22.130	22.321	23.316	23.450
$t = 2000$	33.457	33.700	32.776	33.049	33.842	33.995
Constant	−325.511***	−323.911***	−328.279***	−326.205***	−329.375***	−330.286***
Number of observations	10,100	10,100	10,100	10,100	10,100	10,100
Number of physicians	1,772	1,772	1,772	1,772	1,772	1,772
R^2 (within)	0.126	0.127	0.125	0.126	0.126	0.127
R^2 (overall)	0.112	0.112	0.112	0.112	0.110	0.110
F-test of overall model fit	62.850	44.580	62.700	44.450	63.030	44.700
	$(p > F) = 0$	$(p > F) = 0$	$(p > F) = 0$	$(p > F) = 0$	$(p > F) = 0$	$(p > F) = 0$

**$p < .05$;
***$p < .01$.

patients (45–61, $p<.01$) perform a higher number of deliveries. However, physicians with a greater share of patients with PPO coverage (-15, $p<.01$) or comorbidities (-35, $p<.01$) perform fewer deliveries per year.

DISCUSSION

This study examines the impact of malpractice claims on C-section rates and annual delivery volume in Florida between 1992 and 2000. Using an individual physician-level panel dataset, this study provides evidence on whether the timing of claims and award size matter in physician responses. I did not find any evidence that physicians change their practice patterns by increasing C-section rates in response to a malpractice claim. However, the closing of a claim led to a decrease of six annual deliveries 3 years afterwards with 14 fewer deliveries occurring with large awards (>U.S.$250,000).

The absence of a significant impact on C-section rates may be due to the limited ability of a malpractice claim to convey specific information to a physician that would warrant a change in practice style. Furthermore, even after controlling for clinical risk factors, there may be other factors such as patient preferences for a C-section, which could be similar for physicians with and without a malpractice claim. Finally, performing a C-section by itself may not necessarily reduce the risk of malpractice litigation, which may depend on a physician's bedside manner and tone of voice. Given the small magnitude of effects found in prior studies and the rising prevalence of C-sections nationwide, this null finding suggests that additional research using more recent data is needed.

The absence of effects on delivery volume until 3 years after a claim closing suggests a delayed response that is not affected by the injury occurrence or claim opening. However, the small negative impact on physician delivery volume suggests that a fear effect of incurring a future claim outweighs the income effect, which predicts an increase in deliveries. Physicians with a closed malpractice claim performed six fewer deliveries after 3 years, which represents about 5 percent of average delivery volume. Larger award sizes (>U.S.$250,000) have a somewhat greater effect on delivery volume across specifications. A reduction of 14 deliveries represents about 11 percent of average delivery volume. A supply-side response can occur if a physician chooses to accept fewer high-risk patients several years after a claim closing. However, this finding is also consistent with a demand-side response where public disclosure of the malpractice award in Florida leads to reputation loss

and reduced patient demand. Either response or both responses could have occurred, but this study could not make this distinction.

Although this small decrease in the average volume of deliveries appears to have implications for access to care, a key question is whether other providers may be picking up the additional deliveries that are not being performed by physicians with malpractice claims. As Table 1 shows, the number of obstetrician–gynecologists increased over time, so that physicians without claims appear to be picking up these deliveries. This study does not find evidence that access to care statewide is compromised for inpatient deliveries, which is consistent with prior research (Dranove and Gron 2005). Between 1992 and 2000, the average delivery volume of obstetrician–gynecologists increased from 112 to 142 births, while the number of deliveries by family practitioners declined from 80 to 41 births over the same period. However, the growth in the overall supply of physicians coupled with the increase in average volume suggests that the small reduction of inpatient deliveries was fully absorbed by other obstetrician–gynecologists.

Several data limitations should be mentioned. First, these results from Florida cannot be generalized to other states, which may have different malpractice reform environments. Second, the dataset excluded outpatient procedures and deliveries, which might account for possible shifting of care by obstetrician–gynecologists to outpatient settings, but evidence of such a shift is limited (Mello et al. 2007). Other variables that were excluded due to data limitations include malpractice premiums and physician income, which are assumed to be time invariant in the model. Physicians in regions with higher premiums, other things being equal, may be more sensitive to malpractice claims than other physicians. Third, the administrative dataset is limited to a set of ICD-9 codes to infer the clinical risk profile of a patient. When this profile is aggregated to the physician level, the ability to conduct patient-level risk adjustment is lost. Finally, the study sample excludes claims from uninsured physicians and self-insured entities such as teaching hospitals.

This study builds on the prior work of Dranove and Gron (2005) by analyzing whether malpractice claims at the individual level have an impact on obstetrical practice patterns in Florida. Although access may be diminished for physicians with a high award claim, the effect on access to care is not compromised as other obstetrician–gynecologists are picking up these additional deliveries. Finally, the somewhat greater reduction in delivery volume in response to higher awards suggests that tort reforms with damage caps at the U.S.$250,000 level would have some effect on limiting the reduction in

average delivery volume. However, access to obstetrical care in Florida does not appear to be comprised by malpractice claims.

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NOTES

1. A U.S.$10,000 increase in average premiums increased risk-adjusted cesarean rates by 0.4 percentage points. There was no improvement in birth outcomes, as measured by Apgar scores, which suggested defensive medicine.
2. The time interval between the opening and closing of a claim was stable over this period. However, the number of claims declined in the latter years of the sample because claims that closed after 2000 were excluded from the analysis. For sensitivity testing, I examined the latter half of the period with the earlier years and did not find significant differences in the overall results.

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