HAS THE MALPRACTICE CRISIS IN FLORIDA AFFECTED ACCESS TO CARE FOR MATERNITY PATIENTS?

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10/18/2006

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Abstract

We examine the effects of the recent malpractice "crisis" in Florida on access to care for high risk obstetrics patients. We compare access to care before and after the onset of large premium increases. We also compare access to care in Florida with access in California, a state not considered to be in crisis. We find little evidence that patients in Florida have experienced any increase in travel times. Examining a plausible measure of quality – the market share of low volume providers of high risk deliveries – we find mixed evidence of a crisis effect.

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1. Introduction

According the American Medical Association (AMA, 2005), at least 20 states are currently in "full-blown crisis" due to escalating medical malpractice premiums. A 2003 General Accounting Office report suggested that the impact on access has been relatively limited, a finding that the AMA and other provider organizations have questioned (GAO, 2003). A recent survey of Florida physicians paints a different picture; over half of respondents claimed to have decreased or eliminated services (Brooks et al., 2005). Though the survey responses lack independent validation, they do suggest that the crisis might affect access to care.

In this paper, we use highly detailed patient-level data to examine the impact of the crisis in Florida, an AMA crisis state with rapidly increasing malpractice premia. We focus on obstetrics, the largest of three specialties that have been especially hard hit by malpractice premium increases and that play a prominent role in news accounts of the crisis.[1] Our main focus is on whether the crisis has had measurable impacts on access to care, measured by travel times. We also ask whether the resulting changes in admission patterns might affect the quality of care. We specifically examine the probability that a high risk patient receives care from a low volume provider.

To identify the crisis effect, we compare trends for high risk deliveries (HRDs) in Florida during the crisis period with: (1) trends for HRDs prior to the crisis, (2) trends for low risk deliveries (LRDs) during the crisis period, and (3) trends for HRDs in matched geographic markets in California, a non-crisis state. We find that travel times for all high risk patients

increased by roughly 3 percent between 2000 and 2004 but that the increase is not materially different from trends in other comparison groups. Travel times for rural high risk patients actually declined slightly between 2000 and 2004; again this is not significantly different from comparison trends. Finally, we find that the probability that an HRD in Florida was performed by a low volume provider was flat or declined slightly, significantly reversing prior trends in which low volume providers were gaining market share.

2. Background on the Current Malpractice Crisis

Numerous publications confirm that malpractice premiums have risen dramatically in the past few years.[2] The Medical Liability Monitor's survey of 'base rate' premiums for a typical policy by state and medical specialty showed overall increases between 2001 and 2004 exceeding 50 percent for the five states with highest increases, including Florida.[3] At the same time, some states, such as California, experienced nearly flat premiums. A number of medical malpractice insurers have recently left the market or greatly reduced their volume of business, increasing availability problems.[4] We will not examine the causes of these trends, but will instead focus on their effects on access.

In addition to the Florida survey cited above, a survey of member companies by BlueCross BlueShield (BCBS 2002) revealed that over half the plans in crisis states reported doctors refusing to perform some high risk procedures and that more doctors are leaving practices or retiring, leaving patients scrambling to find alternatives. Numerous accounts of access problems can also be found in the general press.[5] However, the GAO report cited above questioned whether the rate of physician migration has increased over previous trends.

Dranove and Gron (2005) present summary data on patient travel times in Florida through 2003. They find minimal evidence that travel times have increased. Their paper has several limitations. First, they examine a limited time frame. Second, they fail to perform multivariate analyses or report statistical tests. Finally, they cannot say whether trends in Florida differ from trends in non-crisis states. We address these shortcomings by carrying the data through 2004, performing multivariate statistical analysis, and comparing Florida with California. We also address a critical and related question: to the extent that the crisis is causing some providers to drop patients, are patients being reallocated to higher quality providers?

3. Data and Methods

3.1. Data

We use hospital inpatient utilization data from Florida and California for the years 1996, 1998, 2000, 2002, and 2004. The data contain details about every admission to every hospital in each state, including the diagnoses, treatment, patient demographics, and residence zip code. We focus on admissions for deliveries and identify HRDs as those with an ICD-9 code indicating a complication of pregnancy that would be present at the time of the delivery.[6] When compared with deliveries without complications, those with complications are more likely to result in harm to the mother or child that might lead to a lawsuit or to higher damages in the event of a lawsuit.

Our measure of access is travel times. Travel time is a good measure of access for deliveries for two reasons. First, the AMA reports that one of the major consequences of the crisis is that patients are unable to obtain care from a local provider. This problem would be most readily reflected in travel times. Second, research consistently shows that patients prefer to receive care close to home and that maternity patients have especially strong distaste for travel.[7]

This does not imply that a high risk patient would always visit a local provider in favor of a high quality provider that is further away. But it does suggest that increases in travel time would be unwelcome by maternity patients, *ceteris paribus*.

We use the Mapquest travel time calculator to compute travel times from each patient's zip code centroid to the centroid of each hospital's zip code.[8] We eliminate from the analysis patients whose zip codes were not in the same state as the hospital. Of the remaining patients, approximately 5 percent could not be assigned a travel time, due to missing or invalid patient zip codes.

We are also interested in whether observed changes in travel patterns might affect the quality of care. There are many ways to measure quality of care; a common measure that is readily available in our data is the volume of HRDs performed by each physician. We examine the probability that an HRD is performed by a low volume physician. We identify low volume physicians in a given year as those performing fewer than either 10 or 25 HRDs. For this comparison, we examine Florida data only, as the California data do not include physician identifiers.

3.2. Methods

We compare travel times for HRDs in 2004 with travel times in 2000, a period when, by all accounts, the crisis had not yet begun or was just beginning. We perform the analysis for the entire state of Florida and separately for rural areas only. We identify rural areas as those zip codes where at least 30 percent of the population is defined as rural according to the U.S. census. Our findings are not dependent on this precise definition. To determine whether any observed change was more than what might have been expected due to factors unrelated to the crisis, we

compare the simple difference in travel times for HRDs with other travel time differences, including:

· The difference in travel time for LRDs over the same time period

· The difference in travel time for HRDs between 1996 and 2000

· The difference in travel time for HRDs in California during 2000-2004. For this analysis, we compare rural markets in Florida and California.[9] To minimize the potential for bias, we selected 10 counties in California with initial travel times that were comparable to the rural Florida markets.

We control for other factors that affect driving times, including each patient's residence zip code and demographics. Through this set of comparisons, with these control variables, our model excludes the following as alternative explanations for observed changes in travel times among HRD patients: changes in where patients live, changes in patient demographics, changes in managed care network size, and changes in widely available medical technology. Our identifying assumption is that there are no contemporaneous factors aside from the malpractice crisis that (a) affect travel times for HRDs more than for LRDs *and* (b) do so differentially in Florida versus California.

Our unit of observation for this analysis is the individual patient. We estimate the following equation:[10]

(1) $M_{idzt} = \alpha_0 + \alpha_x X_i + \alpha_Z D_Z + \alpha_{DRG} D_{DRG} + \alpha_1 T + \alpha_2 D_{2004} + \alpha_3 (HighRisk*T)$

$+\alpha_4 (HighRisk*D_{2004}) + \varepsilon_{idzt}$, where

M_{idzt} is the travel time for patient i with DRG d in time t in zip code z,

X_i is a vector of individual characteristics,

D_Z is a vector of zip code dummies,

D_{DRG} is a vector of DRG dummies,

D_{2000} and D_{2004} are year dummies for 2000 and 2004,

T is a discrete variable for a time trend (T=0 if year = 1996, T=1 if year = 2000; T = 2 if year = 2004),

HighRisk is a dummy variable for the risk level (HighRisk = 1 if high risk), and

ε_{idzt} is a normally distributed error term.

This specification allows us to assess whether the time trend for HRDs for 2000/2004 differed from the 2000/2004 trend for LRDs ($\alpha_3 + \alpha_4$) or whether it differed from the 1996/2000 trend for HRDs ($\alpha_2 + \alpha_4$).[11] The equation used to compare California with Florida is similar to equation (1). The difference is that the *HighRisk* variable will be replaced by a dummy variable indicating that the patient resides in Florida.

We estimate linear probability equations to assess the probability that patient is treated by a low volume provider.[12] The 1996 data do not adequately report physician identifiers, so we restrict this analysis to data from 1998, 2000, 2002, and 2004. We use a similar specification to equation (1):

$$(2)\ P_{it} = \alpha_0 + \alpha_x X_i + \alpha_Z D_Z + \alpha_{DRG} D_{DRG} + \alpha_1 T + \alpha_2 T_{2002} + \alpha_3 D_{2004} + \varepsilon_{idzt}$$

where P_{idzt} is the probability that patient i in year t obtains care from a provider who had a low volume of HRDs in year t-2. The variable T_{2002} is a trend variable for 2002 and 2004. D_{2004} is an indicator for the year 2004. Using this model, we compare the trend between 1998 and 2000 with the trend between 2002 and 2004 for HRDs only. The coefficient on D_{2004} can be interpreted as the difference between these two trends. All other variables are the same as in previous model.

3.3. Sample Overview

Table 1 reports summary statistics for travel times. Average travel times for HRDs increase over the entire period but the increases are small. Table 2 reports the percentage of high-risk patients in Florida visiting low-volume (<=25 HRDs/year) and very low-volume (<=10 HRDs/year) physicians. Trends for both low-volume and very-low-volume doctors were generally downward for all zip codes. For rural zip codes, the trend for very low volume doctors was inconsistent, while the trend for low volume doctors was downward.

4. Travel Time Results

In the interest of brevity, we do not present the full regression results, which are available upon request. We instead report regression-adjusted travel times for various comparison groups. Table 3 summarizes the main results for the within-Florida difference-in-difference (DD) analyses. The first two columns present results for the entire sample of patients. The last two columns present results for rural patients. Note that significance levels are aided by the large sample sizes; many significant findings are small in magnitude.

Average HRD travel times declined by 0.11 minutes between 2000 and 2004, from 21.30 to 21.19 minutes. The decline for LRDs in this time period was even larger, however, resulting in a borderline significant DD increase of 0.13 minutes. On the other hand, HRD travel time increased between 1996 and 2000, resulting in a significant DD decrease of -.50 minutes. Travel times for HRDs among rural residents declined by 0.45 minutes between 2000 and 2004. This was smaller than the decline for rural LRDs in the same period, so the DD estimate is positive but not significant. On the other hand, the decrease in travel times for rural HRDs followed a

substantial increase between 1996 and 2000. This generates a significant DD estimate of -1.19 minutes.

Lastly, we compare travel time trends in Florida and California. We focus on rural areas because these are most likely to be affected by physician exit, and select a subset of rural areas matched on a variety of criteria described above. Travel times for HRDs among rural residents in these selected areas in Florida declined by 0.49 minutes between 2000 and 2004, compared with an increase of 0.31 minutes in California. The DD is -0.80 but is not statistically significant.

5. Low Volume Provider Results

Table 5 contains the estimates of the probability that an HRD patient in Florida receives care from a low volume provider. We compared the trend in probabilities between 2002 and 2004 (during the malpractice crisis) with the trend between 1998 and 2000 (before the crisis). The results show that the trend in the probability of visiting a very low volume provider (less than or equal to 10 HRDs) was not significantly different between 2002 and 2004 compared to the earlier period. However, the trend in the probability of visiting a low-volume provider (less than or equal to 25 HRDs) did change over this time period. For all zip codes, patients were less likely to visit a low-volume provider in the later time period, relative to the 1998-2000 trend, while patients in rural zip codes were more likely to visit a low volume provider. Thus, the evidence on quality is mixed.

6. Conclusion

In this paper we provide a detailed look at changes in travel times for maternity patients undergoing high risk deliveries in Florida, one of the "poster child" states for the malpractice crisis. We find little evidence that the crisis has affected travel times, either across the board or for rural residents who might be most affected by the crisis. We find some evidence that low volume physicians are performing a smaller share of HRDs overall, though the magnitude depends on the definition of low volume. In rural areas, the change in trend for volume has been in the opposite direction, though even in these areas, patients were more likely to use a higher volume doctor in 2004 than they were in 1998. Overall our results suggest that the anecdotes of patients having problem getting access to care are just that, anecdotes, and, if anything, the apparent withdrawal of low volume providers is an indirect indicator that quality may have increased slightly.

Our study may fail to capture the full effect of the crisis. It is very costly for a physician to build a practice anew, so physicians might wait a while before pulling up stakes. However, malpractice premiums have begun to level off in Florida after four years of steady increases. Between 2004 and 2005, premiums increased between 7% and 14% (*MLM 2005*). If providers did not already pull back from offering HRDs, they might continue to stay in the market from here on out.

Acknowledgements

*We are grateful to Leemore Dafny, Neil Doherty, Robert Kaestner, Joel Shalowitz, Joel Waldfogel and seminar participants at Cornell University, Duke University, the National Bureau of Economic Research's Winter 2005 Insurance Project Workshop, the University of Illinois at

Chicago, and the Wharton School for helpful suggestions. Subramaniam Ramanarayanan provided expert research assistance.

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Table 1: Travel Time Summary Statistics

	FLORIDA			CALIFORNIA		
	Number of patients	Mean	Median	Number of patients	Mean	Median
1996						
HRD	48206	20.7	17	109663	17.3	14
Non-HRD	118973	20.1	17	379279	16.5	13
2000						
HRD	56693	21.8	18	112885	17.5	14
Non-HRD	125409	20.8	17	379237	16.4	13
2004						
HRD	60705	21.9	18	125013	18.0	14
Non-HRD	127375	20.8	18	371144	17.0	14

Table 2: Percent of High-Risk Patients Visiting Low-Volume Doctors

	All zip codes	Rural only
	HRD Volume<=10	
1998	2.19	1.76
2000	2.04	1.57
2002	2.17	1.9
2004	1.9	1.83
	HRD Volume<=25	
1998	12.42	11.98
2000	10.65	8.33
2002	11.57	8.92
2004	8.31	6.86

Table 3
Estimated Trends in Travel Times—Florida

	All zip codes	Rural only
Diff in Diff$_{04\text{-}00}$: [2004-2000]$_{Treatment}$ -- [2004-2000]$_{Comparison}$	0.131 P=.089	0.324 P=.234
Diff in Diff$_{High\ risk}$: [2004-2000]$_{High\ risk}$ − [2000-1996]$_{High\ risk}$	-0.5 P=0	-1.188 P=.003
Average Annual Sample Size	537361	75186

Table 4
Estimated Trends in Travel Times—Florida and California
(HRDs in Selected Rural Counties Only)

	Rural zip codes
Diff in Diff$_{04\text{-}00}$: [2004-2000]$_{Treatment}$ -- [2004-2000]$_{Comparison}$	-0.801 P=.734
Average Annual Sample	26228

Table 5
Probability of Using a Low-Volume Physician—FL, HRDs only
(Diff-in-diff: [2004-2002 trend] – [2000-1998 trend])

	All zip codes	Rural only
HRD Volume<=10	-0.001 P=.352	0.001 P=.724
HRD Volume<=25	-0.008 P=.001	0.019 P=.001

[1] See Dranove and Gron (2005) for further rationale for using these specialties and focusing on Florida.

[2] For example, National Association of Insurance Commissioners' data show that the national medical malpractice premium volume (total medical malpractice revenue) increased by 18.3 percent and 26.7 percent from 2000-2001 and 2001-2002 respectively whereas the average annual increase in premium volume for the prior 6 years (1995-2000) was 0.8 percent.Data are from the National Association of Insurance Commissioners (NAIC): Historical Direct Premiums written (available at www.naic.org/research/Research_Division/Stats/2002_pc_stat_compHISTORY.pdf).

[3] Source: *Medical Liability Monitor*, various years. National data are approximated from *MLM* reports.

[4]The St. Paul Companies announced their withdrawal from the market in December 2001, as did Frontier, Clarendon, and Washington Casualty. Legion was placed in 'rehabilitation' and PHICO was placed in run-off (where no additional policies are written) by the Pennsylvania Insurance Department. Other companies reported to be reducing the number of policies written include CNA and MIIX [Medical Liability Monitor, October 2002.]

[5] For example, see Greene (2004) and Boorstein (2005).

[6] We defined high-risk diagnoses as any patient record that indicated an ICD-9-CM diagnosis code of 64.XX, "complications mainly associated with pregnancy". These include hemorrhage, hypertension, infectious disease, and early delivery. We excluded several diagnoses because they were inconsistently coded across years. These diagnoses were: 64.50 (late pregnancy, unspecified length), 64.51 (post-term pregnancy, 40-42 weeks gestation) and 64.89 (other current conditions classifiable elsewhwere). Post-partum complications (ICD 64.XX2) were excluded from the definition of high-risk deliveries, as providers would not have such information at the time they decided to accept such patients.

We thank Dr. Joel Shalowitz for assistance in developing this list of high risk diagnoses.

[7] For example, see Capps et al., (2003)

[8] For patients who receive care in their own zip code, we set travel time equal to 1 minute. To limit the role of outliers, we set the maximum travel time to 200 minutes. These assumptions improve the precision of our estimates without changing the qualitative conclusions. In the California data, the patient's zip code was masked for some observations. These records were thus incomplete, and had to be omitted from the analysis.

[9] We also compared selected urban markets in Florida and California, discerning no significant difference in trends.

[10] Because we have repeated observations for each zip code, we cluster standard errors by zip code to account for possible lack of independence.

[11] We can also assess whether the change in time trend for HRDs differed from that for LRds (the triple difference α_4.) The triple difference results are similar to the difference in difference results and are omitted for brevity.

[12] Using the linear probability model allows for ready use of zip code fixed effects and more straightforward interpretation of coefficients. The linear probability model is acceptable for this dichotomous choice problem because the sample size is large and the probability of scoring a "1" is very high.