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Malpractice Burden, Rural Location, and Discontinuation of Obstetric Care: A Study of Obstetric Providers in Michigan

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ABSTRACT: ***Context****: It has long been a concern that professional liability problems disproportionately affect the delivery of obstetrical services to women living in rural areas. Michigan, a state with a large number of rural communities, is considered to be at risk for a medical liability crisis.* ***Purpose****: This study examined whether higher malpractice burden on obstetric providers was associated with an increased likelihood of discontinuing obstetric care and whether there were rural-urban differences in the relationship.* ***Methods****: Data on 500 obstetrician-gynecologists and family physicians who had provided obstetric care at some point in their career (either currently or previously) were obtained from a statewide survey in Michigan. Statistical tests and multivariate regression analyses were performed to examine the interrelationship among malpractice burden, rural location, and discontinuation of obstetric care.* ***Findings****: After adjusting for other factors that might influence a physician's decision about whether to stop obstetric care, our results showed no significant impact of malpractice burden on physicians' likelihood to discontinue obstetric care. Rural-urban location of the practice did not modify the nature of this relationship. However, family physicians in rural Michigan had a nearly 4-fold higher likelihood of withdrawing obstetric care when compared with urban family physicians.* ***Conclusions****: The higher likelihood of rural family physicians to discontinue obstetric care should be carefully weighed in future interventions to preserve obstetric care supply. More research is needed to better understand the practice environment of rural family physicians and the reasons for their withdrawal from obstetric care.*

It has long been a concern that professional liability problems disproportionately affect the delivery of obstetrical services to women living in rural areas.[1–3] Physicians in rural areas are especially vulnerable to increases in malpractice costs and difficulties in obtaining liability coverage due to the unique financial structure of their practices.[4–6] They tend to have more patients without insurance coverage and more patients enrolled in Medicaid programs, which typically have lower reimbursement rates, making the pass-through of malpractice costs more difficult.[4–6] Moreover, malpractice premiums comprise a higher share of practice costs for rural specialists than for urban physicians.[4] Several studies have shown urban-rural differences in physician supply in response to malpractice premiums, with physicians practicing in rural areas being more sensitive to premiums.[7,8]

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In many states, physicians, especially those in high-risk specialties such as obstetrics and gynecology, are struggling with increasing malpractice insurance premiums and litigation risk. Michigan is classified by the American Medical Association (AMA) as a state showing signs of a looming medical liability crisis,[9] with liability insurance premiums for obstetrician-gynecologists (ob-gyns) among the highest in the country for years.[10] Michigan ranks 17th among all the states in the average number of paid claims per 1,000 active, non-federal physicians.[11] Medical liability has been considered as one of the important forces influencing maternity care access in rural Michigan.[12]

Geographically, Michigan is surrounded by 4 of the 5 Great Lakes, making it a relatively isolated area with long travel distances to care.[13] Fifty-seven of the 83 counties in Michigan are considered non-metropolitan,[14] where 15% (1.5 million) of the Michiganians reside.[15] Moreover, Michigan is characterized by an uneven population distribution, with most of its population and hence health care facilities concentrated in the southeast corner of the state. Access to specialist physicians is much lower in non-metropolitan than in metropolitan areas (68 per 100,000 people vs 167 per 100,000 people).[16] These characteristics make the delivery of perinatal services especially challenging.[13]

Like many states, Michigan is faced with the threat of increasing malpractice costs and litigation risk jeopardizing rural obstetric care. Recent media reports and research publications have noted similar challenges faced by many rural communities in West Virginia, Texas, Mississippi, Florida, and Washington,[6,17,18] and there have been warnings that increasing malpractice insurance costs and litigation risk may cause an exodus of obstetric providers and discontinuation of obstetric care by providers, particularly in rural areas of these states.[6,17,18] The purpose of this study was to examine the experience of rural obstetric providers in Michigan with regard to malpractice burden and determine whether such burden influences the likelihood of discontinuing obstetric care and whether rural location of practice might precipitate such a relationship.

Methods

Data Sources. Data for this study came from a larger survey project assessing malpractice issues in Michigan; details of the survey have been reported elsewhere.[19] In brief, a self-administered questionnaire was distributed to a stratified random sample of 2,000 Michigan physicians in February 2006, including 800 ob-gyns and 1,200 family/general medicine physicians (hereafter referred to as family physicians). Michigan certified nurse-midwives were also surveyed as part of the larger project, but were not included in this analysis. They are a distinct group of providers and historically have been under less pressure than their physician colleagues in the area of malpractice.[20]

We used the AMA Physician Masterfile as the sampling frame and oversampled physicians with mailing addresses in non-metropolitan areas of Michigan. To improve the response rate, we combined online and mail survey methods with repeated follow-up of non-respondents (including second and third mailings of survey packets). A total of 365 ob-gyns and 471 family physicians responded to the survey for an adjusted response rate of 48.2% and 41.3%, respectively (excluding 98 undeliverable surveys and 3 deceased physicians). Because the primary interest of this paper is the discontinuation of obstetric care and the rural-urban differences in providers' medical liability burden, our analysis focused on the 271 ob-gyns (70 rural and 201 urban) and 229 family physicians (97 rural and 132 urban) who had practiced obstetrics at some point in their career and were still engaged in clinical practice in Michigan at the time of the survey (we excluded respondents who were no longer engaged in clinical practice, were practicing outside Michigan, or were residents/fellows in training).

Measures. Physicians' medical liability burden was assessed from several aspects. First, we asked respondents about their current liability insurance coverage: whether they had coverage, how it was obtained (through an employer or self-purchased), the amount paid for insurance premium in 2006, and the level of difficulty in obtaining coverage. Second, the survey elicited information about each respondent's malpractice claims experience and payments made for malpractice claims: "Has anybody ever filed a claim against you?" and "Of all these claims, have you ever paid (or has anybody ever paid on your behalf) for a jury verdict, settlement, or arbitration award?" To reduce the sensitivity of the survey questions and thereby encourage more responses, we categorized the payments for malpractice claims as small claims and large claims, using $30,000 as a cut-off point. This decision was based on several earlier studies assessing the appropriate threshold for reporting of malpractice claims into the National Practitioner Data Bank.[21,22]

We also assessed whether the physician had stopped obstetric practice by the time of the survey. All physicians included in this analysis had practiced obstetrics at some point in their career. Hence, discontinuation of obstetric practice was determined based on responses to the following survey question:

"Do you currently include obstetrical care in your practice?" (1 if the respondent specified not currently providing obstetric care, and 0 otherwise).

Statistical Analysis. Comparisons between respondents and non-respondents based on the demographic and practice characteristics recorded in the AMA Physician Masterfile suggested that male physicians and older physicians were more likely to respond to the survey. Therefore, sampling weights were constructed to account for the stratified random sampling design and reduce the non-response bias. After applying these final analysis weights, the characteristics of survey respondents were comparable to the general ob-gyn and family physician population in Michigan. These weights were routinely applied in data analyses to generate estimates representative of the Michigan physician population.

The primary interests of this study were to examine whether higher malpractice burden was associated with an increased likelihood of discontinuing obstetric care, and if so, whether such effects differed between physicians practicing in rural versus urban areas of Michigan. Two alternative measures of malpractice burden were used: (1) any malpractice claim in the past, and (2) any malpractice payment of $30,000 or more. We could otherwise measure malpractice payment experience using whether payment of any amount had been made, which generated very similar estimates. However, because the model using large malpractice payment had better model fit, our final analysis adopted this specification. Binary logistic regressions were used for data analysis. Separate regressions were estimated, with claim experience and payment experience being the key explanatory variables. An interaction term between the malpractice burden variable and rural location was included in each regression to test whether there were significant rural-urban differences in the association between malpractice burden and discontinuation of obstetric care.

Our analysis also adjusted for other factors that might influence a physician's decision about whether to stop obstetric care: (1) the physician's personal characteristics including age, gender, race/ethnicity, location of medical school (ie, whether graduated from a medical school in another country), and board certification (certified vs not certified); and (2) the characteristics of the practice including type of practice (primarily solo practice, office-based non-solo practice, or non-office-based practice) and the average number of hours per week spent on direct patient care. Rural-urban location of the physician's primary office and the malpractice burden variable were forced into the model, whereas other variables were selected into the model based on results from bivariate analyses (selecting only those significantly associated with discontinuation of obstetric care at the .10 level).

Sequential logistic regressions were used in which the covariates were added to the model progressively in blocks. We first included the physician's practice location (rural vs urban), the measure of malpractice burden, and the interaction between rural location and malpractice burden. We then added the physician's personal characteristics in the second model and his/her practice characteristics in the last model. This sequential regression approach helped reveal the role of each block of variables in attenuating the observed effects of rural-urban status and malpractice burden on physicians' discontinuation of obstetric care. Because of the differences between family physicians and ob-gyns in various domains of obstetric care (eg, delivery volume and the ability to take on high-risk pregnancies) and malpractice burden, separate analyses were conducted for the 2 specialty groups.

All Michigan counties were categorized as urban or rural based on the metro and non-metro status defined by the Office of Management and Budget.[23] Each respondent was then coded as practicing in urban versus rural areas based on self-reported county name and/or ZIP code of their primary office (we used mailing address to approximate the practice location for 3 respondents who did not provide the county name or ZIP code of their primary office).

The secondary purpose of this study was to assess the magnitude of liability burden among current rural obstetric providers. To do so, we focused on the sub-sample of respondents who reported current practice of obstetrics at the time of the survey. Both unadjusted and adjusted analyses were conducted. In the unadjusted analysis, comparisons were made between rural obstetric providers and their urban counterparts. The Rao–Scott chi-square tests (a design-adjusted version of the Pearson chi-square test) and comparisons of means with adjustment of the sample design were conducted to assess the differences in categorical variables and continuous variables, respectively, between physicians in rural and urban areas.

To account for confounding factors that might have affected physicians' liability risk, we also performed a multivariate logistic regression analysis and reported the adjusted odds ratios (OR) of rural obstetric providers' likelihood of purchasing malpractice insurance by themselves (vs covered through an employer), reporting difficulty in obtaining coverage, experiencing a more than 50% increase in malpractice premium, having had a malpractice claim filed, and

having made malpractice payment (any payment or any payment ≥$30,000) as compared with their urban counterparts. Moreover, for physicians who reported malpractice premium rates, we examined the adjusted rural-urban difference in their premiums via a multiple linear regression analysis.

Besides the previously discussed predictors for the discontinuation of obstetric care, these adjusted analyses included several other possible explanatory variables: the proportion of obstetric patients with high-risk pregnancy (>10% vs ≤10%), the percentage of obstetric patients enrolled in Medicaid (>25% vs ≤25%), and the proportion of obstetric patients covered under managed care (>25% vs ≤25%) (the cut-off percentages were selected such that approximately half of the sample were above the value). In all analysis related to malpractice insurance, we also considered the physician's prior claim and payment experience as candidate explanatory variables. Only variables that were significant in bivariate analyses at the .10 level were included in the final adjusted models. We stratified these analyses by specialty group whenever the sample size permitted.

All analyses accounted for the complex survey design. *P* values less than .05 were considered statistically significant. Data analyses were conducted using SAS 9.1 (SAS Institute Inc., Cary, N.C.).

Results

Sample Characteristics. Our sample included 500 respondents who were currently practicing obstetrics or who had previously provided obstetric care. Their primary offices were located in 68 of Michigan's 83 counties (44 rural and 24 urban); 22.4% were primarily practicing in rural areas (weighted data). The majority of these rural obstetric providers (80.3%) were family physicians, and 21.5% were in solo practice (Table 1). Only 35.8% of the rural obstetric providers were still practicing obstetrics when surveyed, compared with 58.5% of the urban physicians. The majority of rural physicians who were still providing obstetric care at the time of our survey had more than 25% of their obstetric caseload enrolled in Medicaid (Table 2); 43.0% had over half of their obstetric patients enrolled.

Discontinuation of Obstetric Care. We estimated the multivariate logistic regressions to examine the relationship among malpractice burden, rural location, and the likelihood of discontinuing obstetric care while controlling for potential confounding factors (Table 3). Before adjusting for any physician demographic and practice characteristics, having had a malpractice claim filed was associated with an increased likelihood of family physicians stopping obstetric care. However, this association was no longer significant once we adjusted for the physician's age. Malpractice payments of $30,000 or more were not associated with a family physician's discontinuation of obstetric services. For ob-gyns, our analysis found no evidence of prior malpractice claims or payments affecting their decision to cease obstetric care.

Practicing in a rural (vs urban) county significantly increased family physicians' likelihood of withdrawing obstetric care (adjusted OR = 4.01, 95% confidence interval [CI] 1.26-12.76 in the fully adjusted model with claim experience as the measure of malpractice burden; and adjusted OR = 3.24, 95% CI 1.23-8.58 in the fully adjusted model with malpractice payment as the measure of malpractice burden), but no rural-urban differences were found among ob-gyns. Location in a rural setting did not augment or reduce the impact of malpractice burden on a provider's decision to stop practicing obstetrics for either family physicians or ob-gyns (ie, the interaction terms between malpractice burden and rural location were not statistically significant).

Older age significantly increased the odds of discontinuing obstetric care both among family physicians and among ob-gyns (adjusted ORs were approximately 1.1 across the models, $P < .05$; data not shown). In contrast, the number of hours per week spent on direct patient care showed a consistent, modest effect on reducing a physician's tendency to stop obstetric care (with an adjusted OR of approximately 0.96 across the models, $P < .05$; data not shown). Having a private solo practice was associated with a nearly 4-fold increase in family physicians' likelihood of dropping obstetric care ($P < .05$; data not shown), but no such effect was found among ob-gyns.

Rural-Urban Differences in Malpractice Burden. Among respondents who still practiced obstetrics in rural Michigan at the time of the survey, 25.4% family physicians and 66.2% ob-gyns reported having to purchase coverage themselves (Table 4). This compared with 29.5% and 42.5%, respectively, among their urban counterparts. Close to half of rural family physicians and ob-gyns who self-purchased coverage reported a more than 50% increase in their premium rates since 5 years ago. Only 2 respondents in the sample reported not having malpractice insurance for their current practice; both were practicing in an urban setting. Among physicians who self-purchased coverage or were practicing "bare," over 30% of those in rural areas

Table 1. Characteristics of Study Population, by Primary Practice Location

Characteristic	Total (n = 500)	Rural (n = 202)	Urban (n = 298)	*P* Value
Age, mean (range)	49.1 (30-71)	48.8 (30-71)	49.2 (30-71)	.73
Gender (%)				<.01
Male	61.5	72.3	58.4	
Female	38.5	27.7	41.6	
Race/ethnicity (%)				<.01
Non-Hispanic white	89.6	93.4	88.6	
Other	10.4	6.6	11.4	
Specialty (%)				
Obstetrics/gynecology	38.2	19.7	45.3	<.01
Family medicine/general medicine	61.8	80.3	56.5	
Board-certified (%)				<.01
Yes	89.2	86.2	90.1	
No	10.8	13.8	9.9	
Location of medical school (%)				.02
Within the United States	93.2	95.6	92.6	
Another country	6.8	4.4	7.4	
Type of primary practice (%)				.06
Office-based solo practice	18.8	21.5	18.0	
Office-based non-solo practice	65.1	62.9	65.8	
Non-office-based practice	16.1	15.6	16.2	
Hours spent on direct patient care activities per week, mean (range)	42.4 (5-140)	45.5 (6-140)	41.5 (5-105)	.01
Currently providing obstetric care				<.01
Yes	53.6	35.8	58.8	
No	46.4	64.2	41.2	
Number of babies delivered in the past year,* mean (range)	87.7 (0-372)	71.3 (0-300)	90.6 (0-372)	<.01
Currently delivering babies* (%)				.24
Yes	94.4	92.6	94.8	
No	5.6	7.4	5.2	
Number of years practicing obstetrics,* mean (range)	14.0 (0.3-36.0)	13.6 (0.3-34.0)	14.0 (0.5-36.0)	.69

Data were weighted. Respondents with missing data on the variable were not included in these descriptive statistics. For any one of the variables, the proportion with missing data did not exceed 3.0%.

*Among physicians currently practicing obstetrics (total N = 297; 92 rural physicians and 205 urban physicians).

reported some difficulty in obtaining insurance (vs approximately 20% among urban physicians). However, few physicians said it was very or extremely difficult (rural: 1.9%; urban: 4.1%).

The adjusted analysis showed no evidence of differential malpractice insurance burden between rural and urban family physicians who were practicing obstetrics. Nevertheless, after adjusting for other factors, ob-gyns practicing in rural Michigan counties were 3.17 times (95% CI 1.48-6.82) as likely as their urban counterparts to purchase malpractice insurance by themselves, but were less likely to have made malpractice payments (adjusted OR = 0.43, 95% CI 0.21-0.90 for large payment; and adjusted OR = 0.41, 95% CI 0.19-0.89 for any payment). The linear regression analysis on malpractice premiums among ob-gyns suggested that rural location was not associated with premium rates (coefficient estimate = $1,991.30, $P = .67$; no adjusted analysis of malpractice premiums was performed for family physicians due to the small sample size).

Discussion

Like many other states in the United States, rural areas in Michigan experience unique barriers to access, such as longer travel distances to care, limited provider/hospital availability, and higher uninsurance rates.[5,24,25] Although medical liability has long been a concern in the health care industry, with documented adverse impact on practitioners' provision of obstetric services and patients' access to care,[18,26] little data were available to assess the current situation in rural Michigan.

Drawing on a statewide survey, the present study examined the impact of providers' malpractice burden on their discontinuation of obstetric care, providing a timely picture of the medical liability burden borne by

Table 2. Patient Characteristics Among Obstetric Providers Currently Practicing Obstetrics in Michigan, by Primary Practice Location

Patient Characteristic	Total (n = 297)	Rural (n = 92)	Urban (n = 205)	*P* Value
Percentage of obstetric patients with high-risk pregnancy*				<.01
0%	9.1	14.5	8.1	
1%-10%	46.1	32.8	48.5	
11%-25%	31.8	32.0	31.7	
26%-50%	9.9	17.6	8.5	
>50%	3.1	3.1	3.2	
Percentage of obstetric patients covered under Medicaid				<.01
0%	10.2	6.3	10.9	
1%-10%	19.1	2.1	22.1	
11%-25%	20.3	8.2	22.4	
26%-50%	26.9	40.5	24.5	
>50%	23.6	43.0	20.1	
Percentage of black/African American obstetric patients				<.01†
0%	9.5	33.3	5.2	
1%-10%	41.8	62.3	38.1	
11%-25%	26.4	2.2	30.8	
26%-50%	16.0	2.2	18.4	
>50%	6.4	0.0	7.6	
Percentage of Hispanic/Latino obstetric patients				<.01
0%	9.1	31.0	5.1	
1%-10%	61.4	54.1	5.1	
11%-25%	17.7	10.1	62.8	
26%-50%/>50%	11.8	4.9	19.1	

Data were reported in percentages (weighted). Respondents with missing data on the variable were not included in the statistics. For any one of the variables, the proportion with missing data did not exceed 3.0%. The percentages may not add up to exactly 100% due to rounding.

*High risk was self-defined by the respondent.

†Statistical test was conducted to assess the difference between urban and rural physicians regarding whether they had any black/African American obstetric patient (0% vs >0%).

rural Michigan obstetric providers. Although there was no evidence for an adverse impact of malpractice burden on physicians' likelihood to discontinue obstetric care or rural-urban differences in this relationship, we found a nearly 4-fold increase in the likelihood of withdrawing obstetric services among Michigan rural family physicians compared with their urban counterparts. Moreover, although rural ob-gyns were less likely than urban ob-gyns to make malpractice payments, they were 3.2 times as likely to obtain liability insurance by themselves.

Very few studies have examined rural-urban differences in physicians' medicolegal burden.[4] Early research by Danzon[27,28] showed a positive association between urbanization and the frequency and severity of medical malpractice claims. However, these studies used data from the 1970s and early 1980s, and the units of observation were individual states rather than physicians or claims. Our findings add to this literature by providing more recent data on geographic differences in physicians' medical malpractice burden in Michigan. As one of the states showing signs of a looming medical liability crisis,[9] the recent experience in Michigan also offers useful data to help inform other states' regulatory and legislative actions.

The special nature of obstetric care in rural areas has raised concern that even a slight decrease in obstetrical providers may cause significant difficulty in access for pregnant women.[1] This has led to several studies examining the influence of medical liability issues in rural areas of the United States with quite mixed findings. Some suggested that increasing malpractice premiums could cause a severe drop in obstetrical services,[3,17,29] whereas others showed no association between malpractice insurance costs and the likelihood of providing maternity care among rural physicians.[30,31] Our study found no significant effects of malpractice claims or payment experience on obstetric providers' odds of stopping obstetric care whether in rural or urban Michigan. However, because rules governing

Table 3. Effects of Rural-Urban Location and Malpractice Burden on Providers' Likelihood of Discontinuing Obstetric Care

	Model 1*	Model 2†	Model 3‡
Effect of Claim Experience			
Family physicians			
Ever had a malpractice claim filed	**3.80 (1.46-9.86)**	1.78 (0.61-5.14)	2.23 (0.69-7.19)
Primary practice in rural (vs urban) Michigan	**2.98 (1.20-7.38)**	**3.22 (1.21-8.57)**	**4.01 (1.26-12.76)**
Interaction term: claim experience × rural practice	0.65 (0.18-2.39)	0.59 (0.15-2.33)	0.69 (0.15-3.07)
Sample size	226	226	225
Max-rescaled R^2	0.54	0.75	0.89
Obstetrician-gynecologists			
Ever had a malpractice claim filed	2.67 (0.74-9.57)	0.70 (0.16-3.08)	0.83 (0.17-3.98)
Primary practice in rural (vs urban) Michigan	2.31 (0.40-13.27)	3.35 (0.58-19.34)	5.34 (0.79-36.13)
Interaction term: claim experience × rural practice	0.42 (0.06-2.89)	0.34 (0.04-2.69)	0.31 (0.04-2.84)
Sample size	269	269	260
Max-rescaled R^2	0.05	0.53	0.63
Effect of Malpractice Payment			
Family physicians			
Ever made malpractice payment ≥$30,000	1.70 (0.57-5.07)	0.56 (0.17-1.86)	0.76 (0.20-2.90)
Primary practice in rural (vs urban) Michigan	**2.26 (1.11-4.57)**	**2.62 (1.15-5.99)**	**3.24 (1.23-8.58)**
Interaction term: malpractice payment ≥$30,000 × rural practice	0.61 (0.14-2.74)	0.53 (0.11-2.51)	0.51 (0.10-2.54)
Sample size	224	224	223
Max-rescaled R^2	0.19	0.76	0.88
Obstetrician-gynecologists			
Ever made malpractice payment ≥$30,000	1.49 (0.69-3.21)	0.59 (0.25-1.37)	0.58 (0.24-1.43)
Primary practice in rural (vs urban) Michigan	0.94 (0.33-2.69)	1.09 (0.32-3.73)	1.67 (0.42-6.63)
Interaction term: malpractice payment ≥$30,000 × rural practice	1.43 (0.32-6.36)	1.47 (0.24-8.93)	1.24 (0.19-8.13)
Sample size	264	264	255
Max-rescaled R^2	0.03	0.53	0.63

Estimates were reported in odds ratios (95% confidence intervals).

*Model 1 = controlling for rural-urban location of the physician's primary practice, malpractice burden, and the interaction term between these 2 variables.

†Physician personal characteristics, including age, gender, race/ethnicity, medical school (whether graduated from a medical school in another country), and board certification, were considered as candidate explanatory variables to be added to model 2. The exact list of covariates varied across the models for family physicians and obstetrician-gynecologists based on the significance level of their association with discontinuation of obstetric care found in bivariate analyses.

For family physicians: Model 2 = Model 1 + age.

For obstetrician-gynecologists: Model 2 = Model 1 + age, gender, and board certification.

‡Model 3 = Model 2 + type of practice (primarily solo practice, non-office-based practice, vs office-based non-solo practice) and the average number of hours per week spent on direct patient care.

malpractice insurance and litigation are generally regulated at the state level,[32,33] further state-specific studies on the influence of medical malpractice burden on rural obstetric providers are needed.

Additionally, future studies assessing the impact of rising malpractice insurance costs on physicians' practice expenses and how that compares with trends in revenues would improve our understanding of the real magnitude of burden such costs have imposed on rural physicians. Recent research in Washington and Missouri found that reducing compensation and raising cash through loans or liquidating assets were the most common monetary changes cited by obstetric providers in response to liability insurance affordability or availability issues.[18,34] Although our study found no significant differences in the absolute premium rates between rural and urban providers, such costs likely impose a relatively larger burden on rural practices as malpractice premiums may comprise a higher share of practice expenses for rural providers.[4]

A disturbing finding of this study was that rural family physicians who had previously practiced obstetrics were nearly 4 times as likely as their urban counterparts to discontinue obstetric care. Family physicians play a significant role in obstetric care in rural areas.[24,35] Our data showed that in Michigan 80% of the rural physicians who had practiced obstetrics were family physicians. However, nationwide, there

Table 4. Medical Liability Burden Among Obstetric Providers Currently Practicing Obstetrics, by Specialty and Rural-Urban Location

	Family Physicians			Obstetrician-Gynecologists		
Medical Malpractice Burden	Rural (n = 34)	Urban (n = 38)	Adjusted OR†	Rural (n = 58)	Urban (n = 167)	Adjusted OR†
Source of malpractice insurance‡			0.67 (0.13-3.56)			**3.17 (1.48-6.82)**
Self-purchased	25.4	29.5		66.2	42.5*	
Covered through an employer	74.6	70.5		33.8	57.5	
Difficulty in obtaining malpractice insurance for current practice§			—¶			1.73 (0.51-5.91)
Somewhat/very/extremely difficult	32.6	20.9		30.8	18.1*	
Not difficult at all	67.4	79.1		69.2	81.9	
Annual malpractice insurance premium (mean, 95% CI)#	$16,540 ($11,327-$21,752)	$19,245 ($12,996-$25,494)	—¶	$46,290 ($38,678-$53,902)	$41,693 ($35,503-$47,883)	—‖
Changes in malpractice insurance premium from 5 years ago§,**			—¶			2.16 (0.81-5.75)
Increased by more than 50%	48.3	39.6		40.0	24.6*	
Increased by ≤50%/no increase	51.7	60.4		60.0	75.4	
Ever had malpractice claim filed			0.36 (0.06-2.04)			0.56 (0.24-1.29)
Yes	33.3	40.3		72.0	77.9	
No	66.7	59.7		28.0	22.1	
Ever made malpractice payment						
Yes, ≥$30,000	20.9	20.9*	0.48 (0.04-5.57)††	32.5	46.7*	**0.43 (0.21-0.90)††**
Yes, <$30,000	8.6	3.1	0.85 (0.16-4.47)‡‡	11.6	10.6	**0.41 (0.19-0.89)‡‡**
No	70.4	76.0		55.9	42.8	

Data were reported in percentages (weighted), unless otherwise specified. The percentages may not add up to exactly 100% due to rounding.

*Differences between rural and urban physicians were significant at $P < .01$ in unadjusted analysis.

†Data were reported in odds ratios (OR) and 95% confidence intervals (CIs) after adjusting for physician's demographic and practice characteristics including age, gender, race/ethnicity, location of medical school, board certification, type of practice, average number of hours per week spent on direct patient care, and the proportion of obstetric patients having high risk pregnancies, with Medicaid coverage and with managed care coverage. The models for malpractice insurance related measures also adjusted for the physician's previous claim and malpractice payment experience. Only covariates significant in bivariate analyses were used for estimating the adjusted OR.

‡Excluding 2 urban obstetrician-gynecologists who did not have malpractice insurance for current practice.

§Among physicians who were not covered through an employer. N = 125 (17 family physicians, 108 obstetrician-gynecologists).

¶No adjusted analysis was performed due to the small sample size.

#Among respondents who purchased medical liability insurance themselves and reported the premium amount. N = 105 (14 family physicians, 91 obstetrician-gynecologists).

‖Multiple linear regression analysis showed no significant difference in malpractice premiums between rural and urban physicians.

**Excluding physicians who responded "not applicable" (eg, had not been in practice for 5 years yet, or did not have self-purchased coverage currently or previously). N = 112 (14 family physicians, 98 obstetrician-gynecologists).

††Adjusted OR and 95% CI of having made a payment of $30,000 or more for malpractice claims.

‡‡Adjusted OR and 95% CI of having made any payment for malpractice claims.

has been a decreasing trend in the proportion of rural family physicians offering obstetric services: 38.6% had hospital privileges for routine deliveries in 1993 compared with 25.5% in 2000.[35] This underscores the need for more attention to the practice environment of rural family physicians providing obstetric care to identify the reasons for withdrawal.

Several limitations of this study should be kept in mind when interpreting the results. First, although efforts were taken to improve the response rate and sample weights were used to account for observed non-response bias, the results are subject to non-response bias that could not be accounted for statistically. For example, malpractice claims and payments might be over-represented if providers with more adverse experience of malpractice claims were more likely to respond. Future research using claims data from malpractice insurance companies or other sources will improve our understanding of this issue. Second, although we over-sampled rural physicians, our sample size of rural providers who were currently practicing obstetrics was relatively small, precluding further analysis of malpractice burden across the rural continuum and certain characteristics among family physicians. Third, our malpractice claims and payment experience measures included any type of claims, whether obstetrics-related or not. This might have contributed to the lack of finding of a significant impact of claims experience on the discontinuation of obstetric care. Finally, our study focused on the liability burden of Michigan providers. Although the findings provide useful information for other states, the results may not be directly generalizable to other parts of the country.

Despite these limitations, our findings characterized the current experience of medicolegal burden among obstetric providers in rural Michigan, a state with a large number of rural communities and considered to be at risk for a medical liability crisis. The higher likelihood of rural family physicians to discontinue obstetric care should be carefully weighed in future interventions to preserve local obstetric care supply.

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