ORIGINAL RESEARCH

Maternity Care Services Provided by Family Physicians in Rural Hospitals

Richard A. Young, MD

Background: **The purpose of this study was to describe how many rural family physicians (FPs) and other types of providers currently provide maternity care services, and the requirements to obtain privileges.**

Methods: **Chief executive officers of rural hospitals were purposively sampled in 15 geographically diverse states with significant rural areas in 2013 to 2014. Questions were asked about the provision of maternity care services, the physicians who perform them, and qualifications required to obtain maternity care privileges. Analysis used descriptive statistics, with comparisons between the states, community rurality, and hospital size.**

Results: **The overall response rate was 51.2% (437/854). Among all identified hospitals, 44.9% provided maternity care services, which varied considerably by state (range, 17–83%; $P < .001$). In hospitals providing maternity care, a mean of 271 babies were delivered per year, 27% by cesarean delivery. A mean of 7.0 FPs had privileges in these hospitals, of which 2.8 provided maternity care and 1.8 performed cesarean deliveries. The percentage of FPs who provide maternity care (mean, 48%; range, 10–69%; $P < .001$), the percentage of FPs who do cesarean deliveries (mean, 66%; range, 0–100%; $P < .001$), and the percentage of all physicians who provide maternity care who are FPs (mean, 63%; range, 10–88%; $P < .001$) varied widely by state. Most hospitals (83%) had no firm numbers of procedures required to obtain privileges.**

Conclusions: **FPs continue to provide the majority of maternity care services in US rural hospitals, including cesarean deliveries. Some family medicine residencies should continue to train their residents to provide these services to keep replenishing this valuable workforce. (J Am Board Fam Med 2017;30: 71–77.)**

Keywords: **Cesarean Section; Government; Health Facility Size; Hospitals, Rural; Infant; Internship and Residency; Obstetrics; Physicians, Family; Pregnancy; Surveys and Questionnaires**

Family physicians have provided much of the maternity care in rural America, but the number of family physicians who provide maternity care has been decreasing since as far back as the late 1970s,[1–3] though a recent analysis found that rural location is still positively associated with providing this care.[4]

The American College of Obstetricians and Gynecologists has recognized that many rural counties have no obstetricians, who preferentially practice in urban settings.[5] A survey of family medicine and obstetric residents confirmed that family medicine residents were more likely to provide maternity care services to rural areas,[6] and a comprehensive examination of maternity care in Maine found that family physicians provide a disproportionate share of rural deliveries, though this study of US family physician–provided maternity care, which is the most recent, was published in 2003.[7] The local supply of rural physicians who provide maternity care is critical for the best outcomes. Rural areas that lack local obstetric services are associated with less adequate prenatal care and higher rates of preterm delivery, infant mortality, and complications during delivery.[8]

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Corresponding author: Richard A. Young, MD, JPS Health Network, 1500 S. Main Street, Fort Worth, TX 76104 (E-mail: ryoung01@jpshealth.org).

The decreasing percentage of family physicians providing prenatal and intrapartum care in rural areas has contributed to an increased number of rural communities with no local access to maternity care.[9] This trend is also worrisome for its implication for the economic health of a rural community. In 2014, it was estimated that the additional service of maternity care contributed approximately $489,000 per family physician in additional economic benefit to a rural community.[10]

The purpose of this study was to describe the current supply of maternity care providers in rural US hospitals and related issues such as cesarean delivery rates and provision of services, hospital size, community rurality, and requirements for procedural privileges.

Methods

This was a cross-sectional survey mailed to chief executive officers of rural hospitals. The sample included rural hospitals in 15 states that were purposely chosen as a geographically representative sample of states with significant rural populations. No single list of rural US hospitals is available. A preliminary list of hospitals was accessed from the Health Resources and Services Administration Data Warehouse.[11] The hospitals included in this survey were all designated as either "short term" (ie, acute care), "critical access," or "not specified," with ≤400 beds, located outside of major urban areas and their suburbs in the previously mentioned states. Google searches helped identify other rural hospitals, hospitals that were originally classified as rural that had become urban, and rural hospitals that had closed. Potential subject hospitals were then categorized by rural-urban commuting area (RUCA) codes.[12] Those in RUCA areas ≥4 were considered eligible for the study (4 to 6 is defined as micropolitan, representing populations of 10,000 to 49,999; 7 to 9 indicates a small town, population 2500 to 9,999; and 10 is rural, population <2,500).

A modified Dillman approach was used, which included an introductory letter and 3 mailed surveys. Since there was no easy a priori way to know whether the hospitals provided maternity care, 2 versions were included in each mailing: 1 for hospitals that provided maternity care and 1 for those that did not. The maternity care survey instrument was 4 pages and consisted of open-ended, multiple choice, and Likert-type questions. A little over a page of the questions inquired about intensive care units and endoscopy care, and those results are not reported here. Respondents were asked about basic hospital demographics, including critical access status and size, who delivers babies and performs cesarean deliveries, what is required for privileges, and other related questions.

Analysis of quantitative data consisted primarily of descriptive statistics. Results were compared by state or region when possible. Respondents were asked about issues related to obtaining privileges for vaginal deliveries, cesarean deliveries, and prenatal ultrasounds. Previous research has found geographic differences in maternity care services provided by family physicians in the United States.[4] Results were also analyzed based on states that were east or west of the Mississippi River. The χ^2 test was used for categorical data. Analysis of variance was used to compare means of continuous data. SPSS 20.0 was the statistical software used (SPSS, Inc/IBM, Chicago, IL). This study was approved by the JPS Health Network Institutional Review Board.

Results

A total of 854 hospitals in geographic areas with RUCA codes of 4 to 10 were identified and 437 responded (51.2%), of which 196 reported providing maternity care services (44.9% of responding hospitals). Because there is no national list of rural hospitals, much less those that provide maternity care, it was not possible to calculate a response rate based only on hospitals that provide maternity care. The percentage of rural hospitals in each state that provide maternity care services varied widely (mean, 45.6%; range 17.4–88.3%). Hospital demographics for the responding hospitals are listed in Table 1. The majority of surveyed hospitals were considered critical access (70.6%).

Provision of maternity care services is described in Table 2. The majority of rural hospitals had family physicians who provide maternity care, though this varied widely by state. The majority (63%) of all maternity care providers were family physicians. Family physicians in western states were more likely to provide maternity care than those in eastern states, both by percentage (68.1% vs 48.6%; $P < .001$) and actual number (3.2 vs 1.7; $P < .001$). Midwives were a comparatively smaller component of the maternity care workforce, with a mean of 0.4 midwives per rural hospital.

Table 1. Characteristics of All Responding Rural Hospitals by Provision of Maternity Care Services

Characteristic	All Responding Hospitals (N = 437)	Hospitals That Provide Maternity Care (n = 196)	Hospitals That Do Not Provide Maternity Care (n = 241)	*P* Value
Ownership				.21
Local government	26.8%	24.9%	28.3%	
Nonprofit	58.8%	60.4%	57.5%	
For-profit	7.3%	9.6%	5.4%	
Mixed ownership	5.0%	4.1%	5.8%	
No answer	2.1%	1.0%	2.9%	
Rural-urban commuting area (code nos.)				<.001
Micropolitan (4–6)	24.4%	35.9%	14.7%	
Small town (7–9)	44.3%	47.7%	41.4%	
Rural (10)	31.4%	16.4%	44.0%	
Hospital designated ascritical access	70.6%	55.3%	83.4%	<.001
Acute care beds (n)				<.001
1–25	71.8%	57.4%	83.8%	
26–50	12.3%	13.2%	11.5%	
51–100	8.8%	15.2%	3.4%	
>100	7.2%	14.2%	1.3%	

The ratio of family physicians to obstetricians decreased with increasing hospital size and deliveries per year (Tables 3 and 4). However, there was no significant difference in the percentage of all family physicians who perform cesarean deliveries by state or region (mean for all states, 65.9%; range 62.8–80.0%; $P = .47$). A mean of 271 babies were delivered each year, 27% by cesarean delivery. There was no difference in the cesarean delivery rate by rurality, hospital size, or provider mix.

A minority of hospitals required an obstetrics fellowship or its equivalent to obtain privileges to perform vaginal deliveries (39%), abdominal deliveries (44%), and prenatal ultrasounds (26%). The majority of hospitals did not require a certain number of these procedures to obtain privileges (83%, 83%, and 78%, respectively). For the few that did have a set number, the mean was 33 for vaginal deliveries, 34 for abdominal deliveries, and 18 for ultrasounds.

Discussion

Nearly half of responding rural hospitals provided maternity care services, though this varied widely geographically (by state). In these hospitals, the majority of physicians providing both vaginal and abdominal deliveries were family physicians.

Our study was similar to previous studies that found regional differences in family physicians providing prenatal care (decreasing in the South),[13] and maternity care.[14] More family physicians provide maternity care in the western United States. The southeast has the smallest number of hospitals with family physicians providing maternity care, though the few who do it perform their own cesarean deliveries at rates similar to those throughout the rest of the country. Our study confirms a previous study in Washington state documenting that family physicians provided the majority of cesarean deliveries in its rural hospitals.[15]

A few trends recorded in this study fit expected trends. Family physicians were more likely to be the exclusive providers of maternity care services and cesarean deliveries in the smallest and most remote hospitals, especially critical access hospitals. This study provides more details about the effects of geography and hospital size on these outcomes than previous research. A surprise was the noted absence of the requirement of a certain number of procedures performed in order to obtain privileges for vaginal deliveries, abdominal deliveries, and prenatal ultrasounds.

This study was limited by the lack of data from all US states. The overall response rate was good, but a higher response rate may have given slightly different results. The generalizability of our findings may be limited by the fact that there is no comprehensive list of rural hospitals in the United

Table 2. Characteristics of Physicians Providing Maternity Care by State and Overall

State	Hospitals Responding (n)	Family Physicians with Any Hospital Privileges (mean n) ($P = .20$)	Family Physicians Who Provide Maternity Care (mean n) ($P = .001$)	Obstetricians (mean n) ($P < .001$)	Midwives (mean n) ($P = .14$)	Family Physicians Who Perform Cesarean Deliveries (mean n) ($P = .015$)	Physicians Who Provide Maternity Care Who Are Family Physicians (%) ($P < .001$)	Family Physicians Providing Maternity Care Who Perform Cesarean Deliveries (%) ($P < .001$)
Colorado	12	8.2	2.4	2.4	0.9	1.5	46	56
Georgia	9	10.0	1.2	3.5	0.6	1.2	21	100
Indiana	10	6.4	2.3	1.0	0.1	0.9	73	51
Iowa	18	7.8	3.7	0.8	0.2	1.3	78	49
Kansas	22	4.6	3.1	0.5	0.1	2.1	88	68
Kentucky	4	6.7	1.0	2.8	0.5	0.8	29	75
Maine	5	6.2	2.6	1.2	0.2	0.6	71	18
Minnesota	22	7.0	4.3	0.6	0.4	1.9	87	45
Mississippi	5	6.2	2.2	2.8	0.2	2.2	40	100
Montana	9	6.6	3.0	1.2	0.3	2.4	75	83
North Carolina	8	4.8	0.9	1.6	0.4	0.9	38	79
Oregon	15	7.7	2.5	2.1	0.9	1.7	52	66
Pennsylvania	6	3.7	0.8	3.3	0.8	0.0	10	0
Tennessee	5	6.6	3.2	0.8	0.8	2.8	83	80
Texas	41	8.0	2.8	1.8	0.2	2.5	60	91
Total	196	7.0	2.8	1.6	0.4	1.8	63	66

Table 3. Characteristics of Family Physician Provision of Maternity Care Services by Hospital Size

	Hospital Size				
	1 to 25 Beds (n = 112)	26 to 50 Beds (n = 26)	51 to 100 Beds (n = 30)	≥101 Beds (n = 28)	*P* Value
FPs with hospital privileges	5.9	7.5	8.4	9.8	.001
FPs who perform vaginal deliveries	3.4	3.0	1.6	1.3	<.001
FPs who perform cesarean deliveries	2.0	2.2	1.1	1.2	.025
Obstetricians who deliver babies	0.7	1.2	2.8	3.9	<.001
Midwives who deliver babies	0.2	0.5	0.7	0.7	.004
Hospitals with any FP providing maternity care services (%)	94	84	60	36	<.001
Hospitals with any FP performing cesarean deliveries	78	64	43	32	<.001
FPs providing maternity care who perform cesarean deliveries (%)	63	71	70	80	.468
FPs who provide maternity care services, among all physicians (%)	81	65	34	15	<.001
Deliveries per year	139	278	412	643	<.001
Cesarean deliveries (%)	27	25	29	30	.18

Data are mean numbers unless otherwise indicated.
FP, family physician.

States, nor are lists of rural hospitals that provide maternity care maintained. Therefore, a response rate could not be calculated for only those rural hospitals that provide maternity care.

Hospital chief executive officers were asked to comment on services provided in their facilities. Their knowledge of who provides certain services may be more limited than was assumed. There was also no way of knowing the accuracy of the data they supplied for measures such as the total number of deliveries and the rate of cesarean deliveries. There were no data on the quality of care actually provided except for the overall cesarean delivery rate, though previous research found no difference in maternal or child outcomes between family physicians and obstetricians performing cesarean deliveries.[16,17] There was also no universal definition of a rural community nor a rural hospital. Other classification schemes may have given different results.

Lively discussion has recently occurred regarding the role of residency education in maternity care, its requirements, and its impact on graduates' provision of these services.[18–23] Maternity care fel-

Table 4. Characteristics of Family Physician Provision of Maternity Care Services by Rurality

	Rural-Urban Commuting Area Grouping			
	Rural (n = 32)	Small Town (n = 93)	Micropolitan (n = 70)	*P* Value
FPs with hospital privileges	4.7	6.9	8.1	.003
FPs who perform vaginal deliveries	2.8	3.3	2.0	.001
FPs who perform cesarean deliveries	1.9	2.0	1.4	.10
Obstetricians who deliver babies	0.5	0.9	2.8	<.001
Midwives who deliver babies	0.3	0.2	0.7	.002
Hospitals with any FP providing maternity care services (%)	94	89	61	<.001
Hospitals with any FP performing cesarean deliveries	75	76	46	<.001
FPs providing maternity care who perform cesarean deliveries (%)	70	63	67	.70
FPs who provide maternity care services, among all physicians (%)	84	76	37	<.001
Deliveries per year	116	177	464	<.001
Cesarean deliveries (%)	25	26	29	.051

Data are mean numbers unless otherwise indicated.
FP, family physician.

lowships increase the likelihood family physicians provide these services, including cesarean deliveries.[21] Our study clearly showed that family physicians in rural America often perform their own cesarean deliveries, which means they must be trained for this procedure. Modeling this procedure is a challenge even in more family medicine–friendly regions of the country. A report from the Pacific Northwest found that only 5% of family medicine faculty had cesarean delivery privileges.[14]

Recent experiments in family medicine residency education—the P4 project[24,25] and the Accreditation Council for Graduate Medical Education Length of Training Pilot[26]—may shed more light on the connection between educational approaches and the provision of advanced maternity care services by graduates of these programs. Cesarean deliveries may be a particularly important component of extended training options; previous research has found a correlation between training in this procedure and its provision in rural practice.[15,20] Whatever the best training approach, it is clear that some family medicine residencies must continue to train young family physicians to deliver babies and perform cesarean deliveries.

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