POLICY BRIEF
May 2016

UNIVERSITY OF MINNESOTA
RURAL HEALTH
RESEARCH CENTER

State Variations in the Rural Obstetric Workforce

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Key Findings

- The obstetric care workforce in rural hospitals varies substantially across states. Most of these differences are driven by the variability in hospital infrastructure size and birth volume.
- Across rural hospitals in this study, the percentage with at least one obstetrician atending births ranged across states from 50% to 100%. The percentage of rural hospitals with at least one family physician attending births ranged from 11% to 81%.
- Certified nurse midwives were less prevalent in states with a higher proportion of Critical Access Hospitals (CAHs). General surgeons did not attend births in any rural hospitals in five states and were infrequently used in two states; however, they attended births in over half of the rural hospitals in the remaining two states in our study.
- States with a higher frequency of CAHs were more likely to have CRNAs as the sole anesthesia care provider. In these same states, up to half of rural hospitals have labor and delivery nurses that work exclusively in maternity and newborn care.

Purpose

This policy brief describes the obstetric workforce in rural hospitals by state for nine states: Colorado (CO), Iowa (IA), Kentucky (KY), New York (NY), North Carolina (NC), Oregon (OR), Vermont (VT), Washington (WA), and Wisconsin (WI).

Background and Policy Context

The overall frequency and the increasing rate of obstetric units closures in rural hospitals raises concerns about access to obstetric care among rural women, who experience poorer health outcomes than their urban counterparts.[1] Rural hospitals' difficulties in staffing their obstetric units have been documented as the leading reason for these unit closures.[2] Rural hospitals face obstetric unit staffing challenges due to day-to-day variability in the census of obstetric patients, and as well as challenges with retention, recruitment, training, and scheduling of obstetric clinicians.[3]

Many types of staff are necessary to successfully run an obstetrics unit. These include delivery attendants (most commonly obstetrician-gynecologists, family physicians, and certified nurse-midwives, but also including general surgeons), nurses (on the labor and delivery unit, in the operating room, and in the postpartum and/or neonatal care units), and anesthesia staff (anesthesiologists and certified registered nurse anesthetists (CRNAs)). Across both urban and rural settings, there is regional variation in the types of clinicians attending deliveries.[1,4] Only 51% of U.S. counties had an obstetrician-gynecologist practicing in 2010; the density of obstetrician-gynecologists relative to the population of reproductive-aged women was lower in non-core and micropolitan counties than in metropolitan counties.[5] While family physicians play an important role in providing obstetric care in rural areas,[6] the proportion of family physicians in rural counties routinely attending births has decreased from 27% in 2006 to 16% in 2010,[7] with significant variations across U.S. regions.[8] Although state-wide initiatives have been established to address the limited availability of obstetric provider supply in health care shortage areas across the U.S.,[1] limited research compares state differences in obstetric care practice models in rural hospitals. States need data that are specific to their own rural settings in order to design programs and policies to ensure access to obstetric care for rural residents.

Approach

This study used data from a telephone survey conducted between November 2013 and March 2014. The sampling frame included all CAHs and other rural hospitals with at least 10 births in 2010 in nine states: CO,

IA, KY, NY, NC, OR, VT, WA, and WI (n=306). Data on births came from the 2010 Health Care Cost and Utilization Project (HCUP) Statewide Inpatient Databases (SID); births were identified using a validated methodology.[9] We chose the nine states because they had a sizeable rural population and number of rural hospitals providing obstetric care (allowing adequate sample size for analysis); additionally, they offer U.S. regional distribution and the availability of SID data that allow linkage with American Hospital Association (AHA) Annual Survey data. We identified CAHs using the Flex Monitoring Team CAH database,[10] and defined rural areas based on the federal Office of Management and Budget non-metropolitan county definition.

The survey questions focused on the hospital's obstetric services unit, including delivery volume, staffing for obstetrics, and policies regarding labor and delivery. A total of 263 hospitals (86%) responded to the survey. Of those, 244 hospitals were currently providing obstetrics services, and 19 hospitals had stopped providing obstetric services since 2010 and therefore were excluded from this analysis. We merged the survey data with 2013 SID data for these nine states and FY 2012 AHA Annual Survey data. We analyzed the data using descriptive statistics, presenting the results for all 244 responding hospitals by state.

Results

Among the nine states, the characteristics of rural hospitals providing obstetric services varied significantly across states (Table 1). Overall, half of the hospitals here births occurred were CAHs, but the percent ranged from 0% in KY and NY to 80% in WA. Rural hospitals in KY, NY, and NC had higher birth volumes than rural hospitals in the other states. These three states also had much higher hospital accreditation rates (by Joint Commission or American Osteopathic Association), whereas only a quarter of rural hospitals in IA were accredited. NC hospitals had the highest rate of affiliation with a healthcare system (83%) while VT had the lowest (0%).

Table 1. Characteristics of rural hospital survey respondents with obstetric services by state

	Total (n=244)	CO (n=19)	IA (n=52)	KY (n=20)	NC (n=35)	NY (n=19)	OR (n=21)	VT (n=9)	WA (n=20)	WI (n=49)
Critical Access Hospitals	125 (51%)	9 (47%)	40 (77%)	0 (0%)	6 (17%)	0 (0%)	15 (71%)	5 (56%)	16 (80%)	34 (69%)
Annual Births	Number (Percent) of Hospitals									
1-160	74 (30%)	7 (37%)	32 (62%)	0 (0%)	3 (9%)	0 (0%)	6 (29%)	0 (0%)	7 (35%)	19 (39%)
161-320	75 (31%)	8 (42%)	9 (17%)	8 (40%)	5 (14%)	8 (42%)	6 (29%)	4 (44%)	7 (35%)	20 (41%)
321+	95 (39%)	4 (21%)	11 (21%)	12 (60%)	27 (77%)	11 (58%)	9 (43%)	5 (56%)	6 (30%)	10 (20%)
Accreditation[a]	152 (62%)	14 (74%)	13 (25%)	18 (90%)	34 (97%)	16 (84%)	9 (43%)	4 (44%)	7 (35%)	37 (76%)
System affiliation	122 (50%)	8 (42%)	23 (44%)	14 (70%)	29 (83%)	7 (37%)	12 (57%)	0 (0%)	7 (35%)	22 (45%)
	Mean (Std. Dev)									
Hospital beds	64.6 (66.5)	38.4 (19.6)	42.2 (44.7)	159.1 (99.0)	104.1 (74.4)	115.8 (59.3)	41.1 (32.1)	50.6 (39.7)	32.9 (23.2)	37.5 (44.3)
Bassinets	8.2 (5.6)	6.7 (4.4)	5.8 (3.9)	13.8 (7.0)	12.6 (5.6)	10.5 (7.5)	7.0 (3.9)	7.9 (2.5)	6.6 (3.3)	6.4 (4.7)
Operating rooms	4.4 (2.8)	3.3 (1.3)	3.2 (2.3)	6.8 (3.6)	6.3 (3.4)	5.6 (2.3)	3.9 (2.2)	3.9 (1.2)	3.2 (1.6)	4.2 (2.9)
Adjusted average daily census[b]	139.0 (141.9)	73.2 (62.2)	107.2 (105.9)	192.0 (123.5)	172.1 (116.2)	340.7 (192.6)	70.6 (33.9)	159.2 (204.7)	56.2 (36.3)	134.3 (158.9)
Adjusted annual inpatient days	50,752.5 (51,802)	26,762.6 (22,701)	39,141.3 (38,647)	70,015.1 (45,028)	62,807.9 (42,418)	124,357.6 (70,328)	25,764.9 (12,349)	58,098.2 (74,729)	20,556.2 (13,229)	49,047.6 (58,000)

a. Joint Commission or American Osteopathic Association
b. Estimated average number of inpatients and outpatients
Data Sources: SID databases 2013, AHA Annual Survey FY 2012

Table 2. Types of clinicians delivering babies by state

Hospitals with any:	Total (n=244)	CO (n=19)	IA (n=52)	KY (n=20)	NC (n=35)	NY (n=19)	OR (n=21)	VT (n=9)	WA (n=20)	WI (n=49)
Obstetricians										
Percent of Hospitals	77%	74%	50%	100%	100%	100%	81%	100%	65%	71%
Mean (SD) of clinician type in hospitals	3.3 (2.1)	3.4 (2.1)	2.0 (1.5)	3.5 (1.5)	3.9 (2.6)	4.0 (2.1)	3.2 (1.3)	3.8 (1.1)	3.9 (3.0)	2.8 (1.8)
Family Physicians										
Percent of Hospitals	55%	68%	81%	15%	14%	21%	62%	11%	85%	76%
Mean (SD) of clinician type in hospitals	4.5 (3.0)	2.9 (2.1)	4.0 (2.2)	3.3 (3.2)	2.8 (2.0)	1.5 (1.0)	3.9 (3.1)	1.0 (-)[a]	4.7 (2.5)	6.4 (3.5)
Certified Nurse Midwives										
Percent of Hospitals	32%	37%	23%	25%	34%	58%	33%	67%	25%	25%
Mean (SD) of clinician type in hospitals	1.8 (1.3)	2.7 (2.6)	1.2 (.4)	2.0 (1.2)	2.3 (1.7)	1.8 (1.2)	1.1 (0.4)	2.5 (0.8)	1.4 (0.9)	1.3 (0.5)
General Surgeons										
Percent of Hospitals	23%	0%	58%	0%	0%	0%	5%	0%	5%	51%
Mean (SD) of clinician type in hospitals	1.9 (1.1)	- (-)	2.2 (1.2)	- (-)	- (-)	- (-)	1.0 (0.0)	- (-)	1.0 (-)[a]	1.8 (0.8)

a. Standard deviation cannot be calculated because only one hospital is in this category.

The average number of hospital beds varied five-fold across states, with the highest at 159 beds in KY and the lowest at 33 beds in WA. Hospitals in KY, NC, and NY had higher numbers of hospital beds, bassinets, and operating rooms, compared to hospitals in CO, IA, OR, VT, WA, and WI. Average daily census and annual inpatient days varied six-fold across the states (Table 1).

The types of clinicians attending births also varied significantly by state (Table 2). IA had the lowest (50%) percentage of rural hospitals with obstetricians attending births, while all of the rural hospitals in KY, NC, NY, and VT had obstetricians. Conversely, the presence of family physicians attending births ranged from 11% of rural hospitals in VT to 81% in IA. NY (58%) and VT (67%) had the highest percentages of hospitals with certified nurse midwives. Five states did not have any rural hospitals where general surgeons attended births, while over half of the rural hospitals with births in IA (58%) and WI (51%) had general surgeons attending births.

Hospital obstetric practice models differed significantly from one state to another (Table 3, next page). In hospitals in CO and WI, the percentage of hospitals with family physicians and with obstetricians were distributed evenly, with slight differences in the practice model with other obstetric care clinicians, such as certified nurse midwives and general surgeons. In IA and WA, a relatively higher percentage of hospitals had family physicians attending deliveries (50% in IA and 35% in WA) with no obstetricians. In contrast, hospitals in KY, NC, NY, and VT had no rural hospitals with family physicians providing obstetric care.

In five states (CO, IA, OR, WA, and WI), the majority of rural hospitals had CRNAs as the sole providers for the anesthesia and pain management services in labor and delivery care (Table 4, next page). Three states (KY, NY, and NC) had higher percentages of hospitals with both anesthesiologists and CRNAs providing these services. This anesthesia providers' distribution generally tracks with another key workforce factor: hospitals with labor and delivery nurses who work exclusively in maternity and newborn care. In states with higher percentages of hospitals with both anesthesiologists and CRNAs, over 60% of the hospitals had labor and delivery nurses work exclusively in maternity and newborn care; however, only up to 40% of the hospitals in states with more hospitals using CRNAs exclusively did.

Table 3. Percentage of rural hospitals in each sample state by type(s) of clinicians attending deliveries, 2013-2014

Types of clinicians delivering babies:	Total (n=244)	CO (n=19)	IA (n=52)	KY (n=20)	NC (n=35)	NY (n=19)	OR (n=21)	VT (n=9)	WA (n=20)	WI (n=49)
Family Physician (FP) without Obstetricians	23%	26%	50%	0%	0%	0%	19%	0%	35%	29%
Obstetricians without Family Physicians	45%	32%	19%	85%	86%	79%	38%	89%	15%	24%
Both Obstetricians and Family Physicians	32%	42%	31%	15%	14%	21%	43%	11%	50%	47%
P-value		0.474	**<.001**	**<.001**	**<.001**	**0.004**	0.561	**0.023**	**0.021**	**0.005**

Table 4. Anesthesia services and nurse staffing for deliveries in rural hospitals by state

	Total (n=244)	CO (n=19)	IA (n=52)	KY (n=20)	NC (n=35)	NY (n=19)	OR (n=21)	VT (n=9)	WA (n=20)	WI (n=49)
Labor & delivery anesthesia / pain management services provided by:										
Anesthesiologists only	12%	21%	0%	5%	17%	32%	10%	44%	5%	10%
CRNA Only	50%	58%	87%	15%	3%	5%	67%	0%	65%	69%
Both	38%	21%	13%	80%	80%	63%	24%	56%	30%	20%
Labor & delivery nurses who work:										
Exclusively in maternity and newborn care	43%	32%	21%	65%	74%	63%	33%	67%	40%	35%
Also in other areas of hospital	57%	68%	79%	35%	26%	37%	67%	33%	60%	65%

Discussion

There is substantial variability across states in the obstetric care workforce. Hospital size and birth volume seem to drive the staffing mix in individual hospitals as well as the variability across states. This is not surprising, given that both resources and needs for staffing decisions are tied to the volume of patients in a particular clinical service line. These findings have implications both for hospitals and for states.

CAHs and rural hospitals with lower birth volume have a wider range of staffing arrangements for delivery attendants, nursing, and anesthesia services in their obstetric units than larger hospitals with obstetric units. These hospitals have the highest prevalence of multiple-specialty staffing models to provide obstetric care. More limited financial and human resources in hospitals surrounding remote rural areas and smaller towns may force a degree of innovation in staffing, but also impose significant constraints to recruiting and retaining qualified obstetrics staff, and maintaining their skills.

States play an important role in ensuring access to high-quality obstetric care in rural settings. State policy initiatives to address obstetric workforce challenges in a rural context include medical and nursing education to prepare clinicians for rural obstetric practice, and interdisciplinary training to help clinicians from different specialties work effectively together. When delivery attendants from multiple specialties have access to clinical rotations in rural settings and integrated practices, they may have more opportunities to build skills that would be well-suited to rural practice.[11–13] Further, efforts to highlight obstetric care within the residency training curriculum, including positive role models for rural obstetric care, as well as granting of privileges based on training and competence rather than specialty, may lead to more clinicians choosing to deliver obstetric care, or at least to clinicians being more adequately cross-trained in the provision of obstetric care.[14,15]

Continuing medical education offerings in rural areas and at rural hospitals could focus on interprofessional team building (such as TeamSTEPPS[16]) as well as training in advanced life support course in obstetrics (ALSO) to ensure adequate preparation for rare events that may occur more frequently in small-volume rural settings.[17–19] Telemedicine programs and continuing education initiatives, including simulation training, have been successfully implemented to develop and maintain core competencies and skills among rural obstetric clinicians; several of these programs were highlighted in a previous policy brief.[3]

In addition, state laws govern the licensing and practice of healthcare professionals, including physicians, midwives, advanced-practice nurses, and other nursing staff. For example, our findings revealed that the four states where all of the surveyed rural hospitals have obstetricians (KY, NC, NY, and VT) vary in the use of midwives. State scope of practice laws on midwifery practice vary widely,[20] and are associated with differences in the supply and use of midwifery services.[21]

Future research should further explore the specific reasons for rural hospitals' obstetric staffing decisions, whether certain obstetric staffing models are more efficient or effective for recruiting and retaining obstetric providers in smaller hospitals, and how state and federal policies can best support small rural hospitals in ensuring access to high-quality obstetric care. ■

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Funded by the Federal Office of Rural Health Policy
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This study was supported by the Federal Office of Rural Health Policy (FORHP), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under PHS Grant No. 5U1CRH03717. The information, conclusions and opinions expressed in this policy brief are those of the authors and no endorsement by FORHP, HRSA, or HHS is intended or should be inferred. For more information, contact Peiyin Hung (hungx068@umn.edu).

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