



October 2022

MATERNAL HEALTH

Availability of Hospital-Based Obstetric Care in Rural Areas

Why GAO Did This Study

Access to obstetric care is a growing concern in rural U.S. communities, given recent closures of hospitals in rural areas. The loss of hospital-based obstetric services in rural areas is associated with increases in out-of-hospital births and pre-term births, which may contribute to poor maternal and infant outcomes. These have been more prevalent in rural areas and non-White racial and ethnic groups.

House Report 116-450 directed GAO to report on ways to improve access to obstetrics care in rural areas. This report is focused on the hospitals and clinicians that provide delivery services, and describes (1) the availability of hospital-based obstetric services in rural areas, (2) stakeholder perspectives on factors that affect such availability, and (3) stakeholder perspectives on efforts federal agencies, states, and others could take to increase such availability.

GAO reviewed literature published from 2011 through 2022, interviewed researchers and provider associations, and conducted semi-structured interviews with 19 selected stakeholders to obtain their perspectives on factors that affect the availability of care and efforts to address such factors. Stakeholders, comprised of provider associations, patient advocacy groups, researchers, and federal agencies, were selected to represent diverse perspectives, including various obstetric clinicians and organizations representing different racial and ethnic groups.

GAO provided a draft of this report to HHS. HHS provided technical comments, which GAO incorporated as appropriate.

View [GAO-23-105515](#). For more information, contact Alyssa M. Hundrup at (202) 512-7114 or HundrupA@gao.gov

MATERNAL HEALTH

Availability of Hospital-Based Obstetric Care in Rural Areas

What GAO Found

Research indicates that the number of rural hospitals providing obstetric services declined from 2004 through 2018, and more than half of rural counties did not have such services in 2018, according to the most recent data available. Studies showed that closures were focused in rural counties that were sparsely populated, had a majority of Black or African American residents, and were considered low income. Studies also showed differences in the type of clinicians delivering babies in rural and urban areas. Specifically, family physicians were more common in rural areas than in urban areas, while obstetrician-gynecologists and midwives were more common in urban areas, though the prevalence and types of clinicians varied by state.

Stakeholders GAO interviewed most often ranked two factors as most important among a list of seven factors potentially affecting the availability of obstetric care in rural areas. Specifically, stakeholders said:

- **Medicaid reimbursement rates** set by states do not cover the full cost of providing obstetric services. This may mean particular financial losses for hospitals providing these services in rural areas, where a higher proportion of births are covered by Medicaid. Medicaid covered 50 percent of rural births in 2018, compared to 43 percent of births for the United States as a whole, according to the most recent analysis from the Medicaid and CHIP Payment and Access Commission.
- **Recruiting and retaining providers** is particularly challenging for rural areas, as they must compete with urban areas for a limited pool of providers to staff obstetric units that require a full range of maternal health providers, such as physicians and nurses, as well as anesthesiologists.

Stakeholders GAO interviewed most often cited the following efforts federal agencies, states, and others could take to increase the availability of obstetric care in rural areas. Specifically, stakeholders said:

- **Increasing Medicaid reimbursement** would help to keep obstetric services open, as Medicaid covers a higher proportion of births in rural areas than urban areas.
- **Increasing remote consultations**, such as through videoconferencing or phone calls, between clinicians could help ensure that rural patients who live longer distances from higher levels of obstetric care have access to such care through their own clinicians in their communities.
- **Establishing regional partnerships**—such as a hub-and-spoke model where a larger hospital (hub) partners with smaller rural hospitals (spokes) for care coordination and to provide training and other resources—could help ensure rural patients receive risk-appropriate care in their communities. For example, a specialist from the hub hospital could help manage a rural patient's high-risk condition as needed and support the rural clinician for planning delivery at the local hospital.

Contents

Letter		1
	Background	4
	Research Shows More than Half of Rural Counties Do Not Have Hospital-Based Obstetric Services	9
	Factors Cited by Stakeholders That Affect the Availability of Hospital-Based Obstetric Care in Rural Areas	14
	Efforts Cited by Stakeholders to Help Increase the Availability of Hospital-Based Obstetric Care in Rural Areas	22
	Agency Comments	29
Appendix I	Objectives, Scope, and Methodology	31
Appendix II	Bibliography	35
Appendix III	Successes and Challenges from Selected Programs	45
Appendix IV	Stakeholders' Perspectives on Efforts to Address the Availability of Hospital-Based Obstetric Care in Rural Areas	51
Appendix V	GAO Contact and Staff Acknowledgements	54
Tables		
	Table 1: Stakeholders for Semi-Structured Interviews, by Category	33
	Table 2: Count of Stakeholders' Ratings for 21 Identified Efforts that Could Affect the Availability of Hospital-Based Obstetric Care in Rural Areas	51
Figures		
	Figure 1: Illustration of Hub-and-Spoke Model	9
	Figure 2: Example of Program with Remote Consults	25
	Figure 3: Examples of Programs with Regional Partnerships	26

Figure 4: Example of Scholarship and Student Loan Repayment Program

27

Figure 5: Example of Rural Training Track Program

28

Abbreviations

CMS	Centers for Medicare & Medicaid Services
HRSA	Health Resources and Services Administration
OB/GYN	obstetrician/gynecologist

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



October 19, 2022

The Honorable Patty Murray
Chair
The Honorable Roy Blunt
Ranking Member
Committee on Appropriations
Labor, Health and Human Services, Education,
and Related Agencies Subcommittee
United States Senate

The Honorable Rosa DeLauro
Chair
The Honorable Tom Cole
Ranking Member
Committee on Appropriations
Labor, Health and Human Services, Education,
and Related Agencies Subcommittee
House of Representatives

Access to obstetric care is a growing concern for the millions of women of reproductive age that live in rural areas in the United States.¹ Recent closures of rural hospitals and difficulties recruiting and retaining clinicians that provide obstetric services, such as family physicians and obstetricians/gynecologists (OB/GYN), may have reduced the availability of hospital-based obstetric care in rural areas.² As we have reported, from January 2013 through February 2020, 101 rural hospitals closed, out of the approximately 2,260 rural hospitals that were open in 2013; such

¹Reproductive age for women, also known as child-bearing age, is generally defined as between the ages of 15 and 44. Throughout this report, we may use the term “women” to describe the population that generally may become pregnant. However, this term does not include all people who can become pregnant. For example, people who do not identify as either male or female may become pregnant, as may some transgender men.

²There are various ways to define a rural area, and no consistent definition is used across government programs, according to the Health Resources and Services Administration. When we refer to rural counties, this includes both micropolitan and noncore counties. According to the Office of Management and Budget, micropolitan counties include nonmetropolitan counties with an urban core of 10,000 to 49,999 inhabitants. Noncore counties include non-metropolitan counties that do not qualify as micropolitan, and have an urban core of less than 10,000 residents.

closures generally were caused by financial distress, in part, from low-patient volumes.³

Nearly all births in the United States occur in hospitals.⁴ In rural counties, the loss of hospital-based obstetric care is associated with increases in pre-term births, distance traveled for obstetric care, out-of-hospital births, and births in hospitals without obstetric units.⁵ All of these may contribute to poor maternal and adverse infant health outcomes, which have been more prevalent in rural areas and for non-White racial and ethnic groups, particularly for Black or African American and American Indian or Alaska Native populations. For example, we have previously reported increasing rates of maternal mortality in the United States, with deaths during pregnancy or due to pregnancy-related causes disproportionately occurring in those same populations.⁶

Various federal agencies within the Department of Health and Human Services, including the Health Resources and Services Administration (HRSA) and Centers for Medicare & Medicaid Services (CMS), have sought to improve rural health outcomes and prevent maternal mortality and morbidity through grants, financial incentives to providers, and other efforts. State, local, and other efforts also aim to improve access to obstetric services in rural hospitals.

House Report 116-450 includes provisions for us to report on ways to improve access to obstetric care in rural areas.⁷ This report focuses on

³See GAO, *Rural Hospital Closures: Affected Residents Had Reduced Access to Health Care Services*, [GAO-21-93](#) (Washington, D.C.: Dec. 22, 2020) and *Rural Hospital Closures: Number and Characteristics of Affected Hospitals and Contributing Factors*, [GAO-18-634](#) (Washington, D.C.: Aug. 29, 2018).

⁴In 2017, 98.4 percent of births occurred in hospitals, and 1.6 percent of births occurred out of hospitals. MacDorman, M. and Declercq, E. "Trends and State Variations in Out-of-Hospital Births in the United States, 2004-2017." *Birth*, vol. 46 no. 2 (2019).

⁵See, for example, K.B. Kozhimannil, P. Hung, C. Henning-Smith, M.M. Casey, and S. Prasad. "Association Between Loss of Hospital-based Obstetric Services and Birth Outcomes in Rural Counties in the United States." *Journal of the American Medical Association*, vol. 319, no. 12 (2018), and [GAO-21-93](#).

⁶See GAO, *Maternal Mortality: Trends in Pregnancy-Related Deaths and Federal Efforts to Reduce Them*, [GAO-20-248](#) (Washington, D.C.: Mar. 12, 2020) and *Maternal Mortality And Morbidity: Additional Efforts Needed to Assess Program Data for Rural and Underserved Areas*, [GAO-21-283](#) (Washington, D.C.: April 8, 2021).

⁷H.R. Rep. No. 116-450, at 57, 214 (2020).

obstetric care in rural areas, specifically on hospitals and clinicians that provide delivery services. Specifically, this report describes

1. the availability of hospital-based obstetric services in rural areas,
2. stakeholder perspectives on factors that affect the availability of hospitals and clinicians that provide hospital-based obstetric care in rural areas, and
3. stakeholder perspectives on ongoing and proposed efforts federal agencies, states, and others could take to increase the availability of rural hospital-based obstetric care.

To describe the availability of hospital-based obstetric services in rural areas, we conducted a literature review of relevant research published from 2011 through 2022. We also interviewed researchers, including those from three rural health research centers that conduct relevant work; officials from provider associations that represent clinicians providing obstetric services; and officials from several agencies within the Department of Health and Human Services—HRSA, CMS, the Centers for Disease Control and Prevention, and the Agency for Healthcare Research and Quality.⁸

To describe stakeholder perspectives on factors that affect the availability of hospitals and clinicians that provide obstetric services in rural areas and ongoing and proposed efforts to address such factors, we first identified lists of factors and efforts by conducting a literature review (as described above) and interviewing researchers, provider associations, and federal agencies (as described above). We then conducted semi-structured interviews with 19 selected stakeholders representing provider associations, researchers, patient advocacy organizations, and federal agencies to obtain their perspectives on the list of factors that we identified as well as a list of efforts that could be taken to address such factors. As part of these interviews, we asked the selected stakeholders to rank the list of factors from most to least important and rate the efforts based on their perceived effect on the availability of obstetric care in rural

⁸Specifically, we interviewed researchers from the North Carolina Rural Health Research Program, which conducts research on hospital closures; the University of Minnesota Rural Health Research Center, which conducts research on maternal health and access; and the Washington, Wyoming, Alaska, Montana, Idaho Rural Health Research Center, which conducts research on the healthcare workforce. In addition, we interviewed researchers from the March of Dimes and National Rural Health Association. In terms of provider associations, we interviewed the American Academy of Family Physicians, American College of Nurse Midwives, and American College of Obstetricians and Gynecologists.

areas. We selected these stakeholders to represent a diversity of perspectives and experiences, including those representing different racial and ethnic groups, and from clinicians that provide obstetric care or other clinical care during delivery. In presenting the results, we used modifiers to quantify stakeholders' views.⁹ See appendix I for additional details on our scope and methodology for this report.

We conducted this performance audit from November 2021 to October 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Characteristics of Rural Populations

In 2020, 46 million people lived in rural areas in the United States, making up 14 percent of the total population, according to U.S. Census data.¹⁰ These data showed that 24 percent of people that lived in rural areas in 2020 were from racial and ethnic groups that were not White, which is less than their representation in the United States as a whole.¹¹ However, different regions of the United States contained more racial and ethnic diversity, with rural counties in the South and West being particularly diverse.

⁹When we report the results, we use the term “some” stakeholders to represent more than 0 but less than or equal to 20 percent of responses (1-4 stakeholders); “several” stakeholders to represent more than 20 percent but less than or equal to 40 percent of responses (5-8 stakeholders); “many” stakeholders to represent more than 40 percent but less than or equal to 60 percent of responses (9-11 stakeholders); “most” stakeholders” to represent more than 60 percent but less than or equal to 80 percent of responses (12-15 stakeholders); and, “nearly all” stakeholders to represent more than 80 percent but less than 100 percent of responses (16-18 stakeholders).

¹⁰U.S. Department of Agriculture. Economic Research Service, *Rural America at a Glance, 2021 Edition*. Economic Information Bulletin Number 230 (Washington, D.C.: November 2021).

¹¹In 2020, 42 percent of residents in the United States were from racial and ethnic groups that were not White. See Brookings, “Mapping Rural America’s Diversity and Demographic Change,” *The Avenue* (Washington, D.C.: Sept. 28, 2021), <https://www.brookings.edu/blog/the-avenue/2021/09/28/mapping-rural-americas-diversity-and-demographic-change/> (accessed Aug. 11, 2022).

Census data show that rural areas also lost population overall between 2010 and 2020 compared to urban areas, seeing a decline in population of 0.6 percent compared to an increase of 8.8 percent, respectively. Most of the population losses in rural counties have been concentrated in those counties with persistent poverty (5.7 percent decrease in population) compared to rural counties with no persistent poverty (0.1 percent increase in population).¹² Additionally, those rural counties with persistent poverty also had high percentages of people from racial and ethnic groups that were not White.

Compared to their urban counterparts, rural residents tend to be older, poorer, and sicker.¹³ Rural residents are also more likely to be covered by Medicaid, a federal-state health-care financing program for certain low-income and medically needy individuals, than residents living in urban areas. Medicaid is administered by states, according to federal requirements, and states set reimbursement rates. Under the Patient Protection and Affordable Care Act, states had the option to expand Medicaid to cover nearly all adults with incomes up to 133 percent of the federal poverty level, thereby increasing the number of beneficiaries covered by the program.¹⁴ In 2018, Medicaid covered 50 percent of births in rural areas, compared to 43 percent for the United States as a whole, according to the most recent analysis we identified.¹⁵

Overall, the number of births in the United States has been in decline for nearly the last 30 years, according to the Centers for Disease Control and

¹²The Economic Research Service defines counties as having persistent poverty if 20 percent or more of the population lived at or below the Federal poverty line during the four consecutive U.S. Census measurements dating to 1980.

¹³J. Foutz, S. Artiga, R. Garfield. "The Role of Medicaid in Rural America. Kaiser Family Foundation (Washington, D.C.: April 2017).

¹⁴The Patient Protection and Affordable Care Act gave states the option to expand their Medicaid programs by covering nearly all adults with incomes at or below 133 percent of the federal poverty level beginning January 1, 2014. Pub. L. No. 111-148, 124 Stat. 119 (2010), as amended by the Health Care and Education Reconciliation Act of 2010, Pub. L. No. 111-152, 124 Stat. 1029 (2010). The Act also permitted an early expansion option, whereby states could expand eligibility for this population, or a subset of this population, starting on April 1, 2010. States choosing to expand their Medicaid programs receive a higher federal matching rate for the enrollees covered by the expansion.

¹⁵Medicaid and CHIP Payment and Access Commission. *Fact Sheet: Medicaid's Role in Financing Maternity Care* (Washington, D.C.: January 2020).

Prevention's National Vital Statistics System.¹⁶ Yet, research shows that women in rural areas were more likely to have children and have higher numbers of children than their urban counterparts.¹⁷ Despite this, the number of total births in rural areas is smaller than in urban areas because of the population size differences in the numbers of women in rural and urban areas.

Types of Clinicians That Provide Obstetric Services in Hospitals

A variety of clinicians provide obstetric services in hospitals in the United States, with the support of nurses and other clinical staff, such as anesthesiologists. Clinicians providing obstetric services in hospitals include the following:

- **OB/GYNs**, physicians that specialize in providing care related to pregnancy, including attending births (i.e., delivering babies) at hospitals, and the female reproductive system. The practice of obstetrics and gynecology includes surgical expertise due to the nature of the care provided, such as for caesarean sections.
- **Family physicians**, considered primary care physicians, as they provide comprehensive first contact and continuing care for persons with a broad range of health concerns, including obstetric care. Family physicians may attend births in hospitals and may also perform caesarean sections, depending on their training.
- **Certified nurse-midwives and certified midwives**, both generally attend births in hospitals, birthing centers, or in homes. Certified nurse-midwives can provide a full range of primary care services, including obstetric care; have prescriptive authority; and are eligible to practice in all U.S. states. Certified midwives provide a full range of primary care services similar to certified nurse-midwives, but their ability to practice is limited to certain states.¹⁸

Additionally, doulas—trained professionals that provide physical, emotional, and informational support to mothers before, during, and

¹⁶The overall birth rate in 1990 was 16.7 per 1,000, while the birth rate was 11.6 in 2018. See National Center for Health Statistics. *Health, United States, 2019*. (Hyattsville, M.D.: 2021).

¹⁷K. Daniels, G.M. Martinez, C.N. Nugent. "Urban and Rural Variation in Fertility-related Behavior among U.S. Women, 2011-2015." *National Center for Health Statistics Data Brief*, No. 297, January 2018.

¹⁸Another type of midwife, known as certified professional midwives, mostly attend births in homes or birth centers, and are thus not a focus of this report. Certified professional midwives provide care, education, counseling, and support during the pregnancy, birth, and the postpartum period.

shortly after childbirth—may assist patients in hospitals. Doulas do not provide clinical care, such as delivering babies.

Education required for physicians to practice. Physicians, including family physicians and OB/GYNs, typically undergo graduate medical education, also known as residencies, to complete their formal education as physicians.

- Residency programs for family physicians are generally 3 years and involve rotations in obstetrics, pediatrics, general surgery, emergency medicine, and inpatient hospital care.
- OB/GYNs generally participate in residency programs for 4 years and may rotate in specialties, such as maternal fetal medicine, reproductive endocrinology, and gynecologic oncology, among other things.¹⁹

Each state has its own “scope of practice” requirements, which typically define a physician’s practice and qualifications, among other things. Once physicians are certified and licensed, they then submit their credentials to specific hospitals and other facilities to be granted privileges to practice within their designated scope, through a process known as credentialing and privileging.

Education required for midwifery practice. Formal education requirements vary depending on the type of midwife. Certified nurse-midwives and certified midwives complete graduate degrees in midwifery education. Certified nurse-midwives complete nursing training before or during their midwifery education programs, while certified midwives complete required health and science courses before or during their midwifery education programs.

States’ scope of practice requirements for midwifery practice differ, and not all states will license certified midwives to practice. Similar to physicians, once midwives are certified and licensed, they then submit

¹⁹Physicians may also undergo additional graduate medical education in specific subspecialties, also referred to as fellowships. For example, family physicians can opt to get more specialized training in obstetric care. According to a 2008 study, 5 percent of family medicine residents end up subspecializing. See E. Salsberg, et al, “US Residency Training Before and After the 1997 Balanced Budget Act,” *Journal of the American Medical Association*, vol. 300, no. 10 (2008): 1174-1180.

their credentials and apply for privileges to practice in specific hospitals and other facilities.

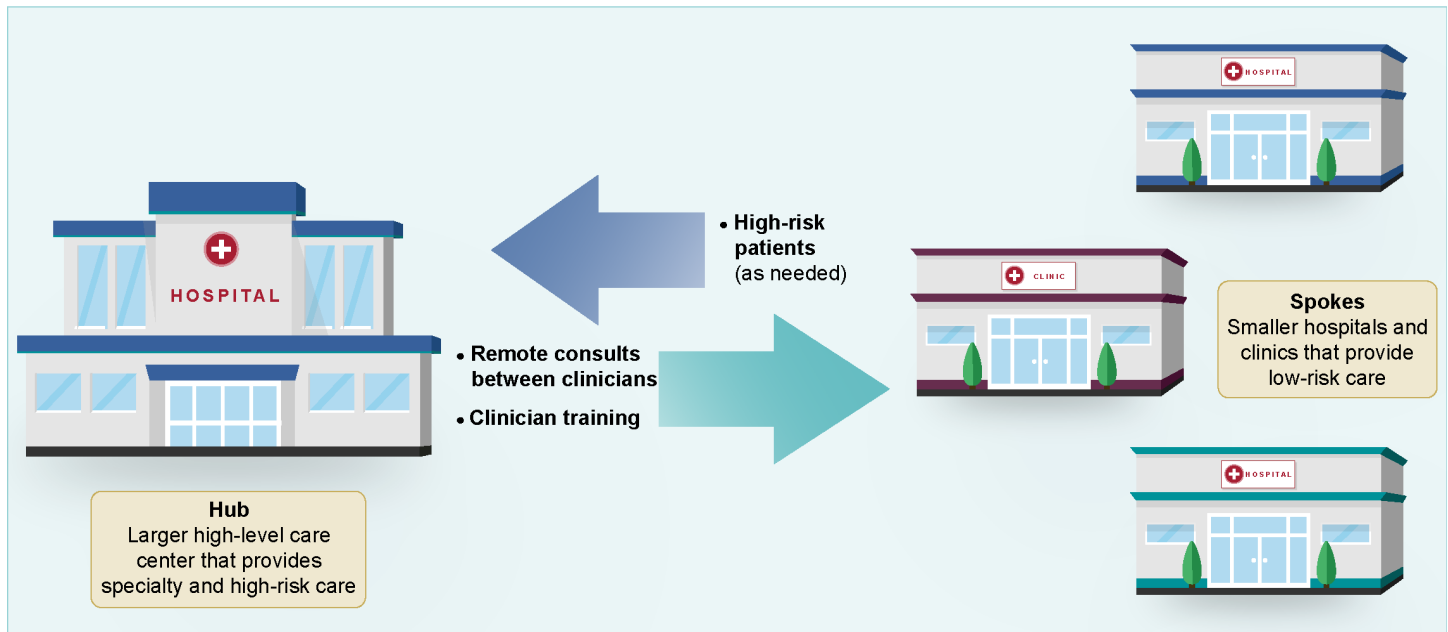
Regionalization and Levels of Care

Depending on their size and resources, rural hospitals and other facilities have different capacities to provide different levels of risk-appropriate obstetric care. Perinatal regionalization is intended to help ensure that pregnant patients and newborns have access to risk-appropriate care when needed and generally involves coordination amongst hospitals and facilities with different levels of care within a given geographic area.²⁰ There are many models for regionalization, including a hub-and-spoke model, in which larger and smaller facilities connect to provide care at the level of care needed (see Figure 1). The levels range from Level I facilities that provide basic care for low to moderate risk pregnancies and low risk newborns to Level IV regional perinatal centers and regional neonatal intensive care units that provide care for the most complex maternal and neonatal conditions and critically ill pregnant women and newborn infants.²¹

²⁰The term perinatal refers to the time period around the time of birth. Regionalization first started in the 1970s with an emphasis on neonatal care and improving those outcomes, and subsequent research found it to be effective at improving neonatal health outcomes. More recently, the American College of Obstetricians and Gynecologists and the Society of Maternal-Fetal Medicine established levels of maternal care given high and increasing rates of maternal mortality rates in the United States. Evidence of the beneficial effect of regionalization on maternal outcomes is so far limited. See, American Academy of Pediatrics and American College of Obstetricians and Gynecologists, *Guidelines for Perinatal Care, Eighth Edition*. (Elk Grove, Ill., and Washington, D.C.: September 2017).

²¹Accredited birthing centers are not assigned a level because well-established standards governing birth centers are already available. These centers provide care for low-risk women with uncomplicated pregnancies who are expected to have uncomplicated births. The Centers for Disease Control and Prevention developed the Levels of Care Assessment Tool to support decision-making about risk-appropriate care at a regional level. Twenty-five states implemented this tool to identify local resources and identify gaps, as of May 2022.

Figure 1: Illustration of Hub-and-Spoke Model



Source: GAO. | GAO-23-105515

Research Shows More than Half of Rural Counties Do Not Have Hospital-Based Obstetric Services

Various studies we reviewed and interviews with researchers indicate that in rural areas, hospital-based obstetric services have declined, and more than half of rural counties did not have such services as recently as 2018. Specifically, studies we reviewed found the following:

- From 2014 through 2018, nearly 3 percent of rural counties (53 counties) lost hospital-based obstetric services, leaving about 56 percent of rural counties with no obstetric services in 2018.²²

²²K.B. Kozhimannil, J.D. Interrante, M.S. Tuttle, and C. Henning-Smith. "Changes in Hospital-Based Obstetric Services in Rural US Counties, 2014-2018." *Journal of the American Medical Association*, vol. 324, no. 2 (2020): 197. This analysis of hospital closures was based on the American Hospital Association Annual Survey, the CMS Provider of Services file, and the Area Health Resources File. Data from 2018 was the most recent available at the time of the study, and we did not identify more recent information through our literature review and web searches.

-
- According to another study, as of 2017, just under half of all hospitals operating in rural areas provided obstetric services (987 hospitals).²³
 - In 2014, 54 percent of rural counties had no hospital-based obstetric services, with 9 percent of rural counties (179 counties) losing obstetric services from 2004 through 2014, according to an additional study.²⁴

Research suggests that the availability of hospital-based obstetric services in rural counties varies by state, with the Southern region of the United States having the lowest density of rural hospital-based obstetric services available to women of childbearing age. Specifically, one study found that as of 2014, six states had no hospital-based obstetric services in more than two-thirds of their rural counties, while six states had hospital-based obstetric services in 80 percent or more of rural counties.²⁵ Another study from 2021 found that as a region, the South had the lowest density of rural hospital-based obstetric services in the nation and the West had the highest density—7 rural hospitals offering obstetric services

²³K.B. Kozhimannil, J.D. Interrante, M.S. Tuttle, C. Henning-Smith, and L. Admon. “Characteristics of US Rural Hospitals by Obstetric Service Availability, 2017.” *American Journal of Public Health*, vol. 110, no. 9 (2020): 1315. The March of Dimes reported that generally 45 percent of U.S. hospitals in 2018 were providing obstetric services. See March of Dimes, *Nowhere to Go: Maternity Care Deserts Across the U.S., 2020 Report* (Arlington, Va.: 2020).

²⁴P. Hung, C.E. Henning-Smith, M.M. Casey, and K.B. Kozhimannil. “Access to Obstetric Services in Rural Counties Still Declining, With 9 Percent Losing Services, 2004-14.” *Health Affairs*, vol. 36, no. 9 (2017): 1663. Between 2004 and 2014, 898 rural counties did not have any hospital-based obstetric services and 179 rural counties lost services. The closures include hospitals that closed obstetric units as well as hospitals with obstetric units that closed entirely. This analysis of hospital closures was based on the American Hospital Association Annual Survey, the CMS Provider of Services file, and the Area Health Resources file.

²⁵University of Minnesota Rural Health Research Center. *Policy Brief: State Variability in Access to Hospital-Based Obstetric Services in Rural U.S. Counties*. (Minneapolis, Minn.: University of Minnesota, April 2017). The six states with over two-thirds of rural counties with no hospital-based obstetric services in 2014 were North Dakota (85 percent), Florida (83 percent), Virginia (79 percent), Alaska (73 percent), Nevada (69 percent) and South Dakota (69 percent). The six states with 80 percent or more of rural counties with hospital-based obstetric services in 2014 were Connecticut, Hawaii, Maine, and Massachusetts (100 percent); New Hampshire (86 percent); and Vermont (82 percent).

per 100,000 women of reproductive age and 15 per 100,000, respectively.²⁶

Research indicates that declines in hospital-based obstetric services were more likely in rural counties that were sparsely populated, low-income, and where the majority of the population is Black or African American. In particular, three studies found that many of the hospitals that closed their obstetric services at some point between 2004 and 2018 were in rural noncore counties, and those counties were less likely to have hospital-based obstetric services even before any closures.²⁷ Additionally, two studies found that closures that occurred at some point between 2004 and 2018 were more likely in rural counties with a majority of Black or African American residents, and one of the two studies found that closures between 2004 and 2014 were more likely in rural counties with lower median household incomes.²⁸

Researchers that we interviewed, and hospital closure information from the North Carolina Rural Health Research Program, noted that the rate of hospital closures generally appeared to decrease during the COVID-19 pandemic in 2021 and 2022.²⁹ The researchers said they expected this was likely due to increased federal funding to hospitals to respond to the pandemic, and they expected that closures would continue after such aid dissipates. One study reported that the increased federal funding will be fully distributed by the end of 2022, and unless additional funding is

²⁶University of Minnesota Rural Health Research Center. *Policy Brief: State and Regional Differences in Access to Hospital-Based Obstetric Services for Rural Residents, 2018*. (Minneapolis, Minn., University of Minnesota: August 2021). This article presents information for women of reproductive age between the ages of 15 through 49 years.

²⁷Noncore counties have an urban core with fewer than 10,000 residents. See University of Minnesota Rural Health Research Center. *Health Policy Brief: Closure of Hospital Obstetric Services Disproportionately Affects Less-Populated Rural Counties*. (Minneapolis, Minn., University of Minnesota: April 2017). This study examined rural hospital obstetric services closures between 2004 through 2014. Additionally, see University of Minnesota Rural Health Research Center, *Policy Brief: Rural and Urban Hospital Characteristics by Obstetric Service Provision Status, 2010-2018*. (Minneapolis, Minn., University of Minnesota: April 2021); and P. Hung, et al. *Health Affairs*, 2017.

²⁸P. Hung, et al. *Health Affairs*, 2017; and University of Minnesota Rural Health Research Center, *Rural and Urban Hospital Characteristics*, 2021.

²⁹The North Carolina Rural Health Research Program tracks hospital closures. See, <https://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures/> (accessed August 17, 2022).

authorized, rural hospitals are expected to return to pre-pandemic levels of profitability.³⁰

In addition, we found the prevalence of certain types of clinicians providing hospital-based obstetric services in rural areas differed from urban areas. In particular, studies we reviewed found that family physicians providing obstetric services were more common in rural areas than they were in urban areas. In contrast, research shows that OB/GYNs and midwives were more prevalent in urban areas.

For example, one study estimated that in 2019:

- **In rural counties overall**, there were 34 family physicians, 35 OB/GYNs, and 9 advanced practice midwives per 100,000 women of childbearing age.³¹
- **In urban counties overall**, there were 10 family physicians, 60 OB/GYNs, and 11 advanced practice midwives per 100,000 women of childbearing age.³²

Additionally, the study found that the prevalence and types of clinicians practicing in rural areas varied by state though OB/GYNs tended to largely practice in micropolitan counties, whereas family physicians were much more prevalent in the more sparsely populated rural counties (i.e., noncore counties).³³ Overall, about 30 percent of rural counties did not

³⁰See North Carolina Rural Health Research Program. Findings Brief: Rural Hospital Profitability during the Global COVID-19 Pandemic Requires Careful Interpretation. (Chapel Hill, N.C., University of North Carolina at Chapel Hill: March 2022).

³¹Washington, Wyoming, Alaska, Montana, Idaho Rural Health Research Center. *The Supply and Rural-Urban Distribution of the Obstetrical Care Workforce in the U.S.* (Seattle, Wash., University of Washington, June 2020). Advanced practice midwives include certified nurse midwives. The study used data from the American Board of Family Medicine to only include family physicians that reported delivering babies in its estimates of family physicians.

³²Additionally, another study focused on OB/GYN relocations between 2005 and 2015 found that OB/GYNs were predominantly relocating to urban counties. See I.M. Xierali, M.A. Nivet, and W.F. Rayburn. "Relocation of Obstetrician-Gynecologists in the United States, 2005-2015." *Obstetrics & Gynecology*, vol. 129, no. 3 (2017): 543.

³³Micropolitan counties include nonmetropolitan counties with an urban core of 10,000 to 49,999 inhabitants. Noncore counties include non-metropolitan counties that do not qualify as micropolitan, and have an urban core of less than 10,000 residents.

have any clinicians providing hospital-based obstetric services in 2019, according to the study.³⁴

Two other studies that surveyed hospitals in nine states found that the trends in the types of clinicians attending births (i.e., delivering babies) were also dependent on birth volumes.³⁵ In hospitals with low birth volumes, which one study defined as less than 240 births annually, family physicians and general surgeons were more likely to attend births than OB/GYNs and midwives.³⁶ In contrast, higher birth volume hospitals were more likely to have OB/GYNs and midwives attending births.

Research also shows that the proportion of family physicians attending births has been decreasing in the United States, but those that do so primarily practice in rural counties.

- In particular, one study found that the percentage of family physicians in the United States that attend births decreased from 23 percent in 2000 to just below 10 percent in 2010.³⁷
- Another study found similar trends in percentages of family physicians attending births between 2003 and 2009, with deliveries being more common in rural areas. Of those family physicians that attended

³⁴The March of Dimes similarly reported in its 2020 report that 40 percent of U.S. counties overall (1,248 counties) had no clinician providing obstetric services, such as an OB/GYN or certified nurse midwife. See March of Dimes, *Nowhere to Go: Maternity Care Deserts Across the U.S. 2020 Report*.

³⁵K.B. Kozhimannil, M.M. Casey, P. Hung, X. Han, S. Prasad, and I.S. Moscovice. "The Rural Obstetric Workforce in US Hospitals: Challenges and Opportunities." *Journal of Rural Health*, vol. 31, no. 4 (2015); and University of Minnesota Rural Health Research Center. *Health Policy Brief: State Variations in the Rural OB Workforce*. (Minneapolis, Minn., University of Minnesota: May 2016).

³⁶According to the American Hospital Association Annual Survey data from 2018, approximately 36 percent of rural hospitals had fewer than 200 births. K.B. Kozhimannil, J.D. Interrante, L.K. Admon, and B.L. Basile Ibrahim. "Rural Hospital Administrators' Beliefs about Safety, Financial Viability, and Community Needs for Offering Obstetric Care." *Journal of the American Medical Association Health Forum*, vol. 3, no. 3 (2022).

³⁷S.T. Tong, L.A. Makaroff, I.M. Xierali, J.C. Puffer, W.P. Newton, and A.W. Bazemore. "Family Physicians in the Maternity Care Workforce: Factors Influencing Declining Trends." *Maternal and Child Health Journal*, vol. 17 (2013): 1576.

births, about half reported attending few births—between 1 and 25 births a year.³⁸

- Lastly, another more recent study found that between 2017 and 2018, about 7 percent of family physicians reported attending births.³⁹ This study also found that few family physicians (2 percent) reported conducting caesarean sections, and of those that did, more than half did so in rural counties without any OB/GYNs, indicating that without a family physician providing such care, a patient may have had to travel farther away for a caesarean section.

Factors Cited by Stakeholders That Affect the Availability of Hospital-Based Obstetric Care in Rural Areas

The 19 stakeholders we interviewed, including provider associations, researchers, other experts, and federal agencies, most often cited financial factors and staffing issues as the top factors affecting the availability of rural hospital-based obstetric care, specifically for hospitals and clinicians that provide delivery services. Specifically, stakeholders ranked two factors highest among a list of seven factors we presented to them as potentially affecting the availability of rural hospital-based obstetric care: 1) Medicaid reimbursement and coverage, and 2) recruiting and retaining clinicians. The other five factors include organizational factors, training opportunities, medical liability insurance, scope of practice requirements for clinicians, and community factors.

Several stakeholders stated that all seven of the factors we identified have important effects on the availability of obstetric care, even ones they ranked as less important.⁴⁰ The stakeholders added that different rural areas may need to prioritize addressing different factors depending on the specific challenges faced by the hospitals and communities, and

³⁸W.F. Rayburn, S.M. Petterson, and R.L. Phillips. "Trends in Family Physicians Performing Deliveries, 2003-2010." *Birth*, vol. 41, no. 1, (2014): 26-32.

³⁹S.T. Tong, A.R. Eden, Z.J. Morgan, A.W. Bazemore, and L.E. Peterson. "The Essential Role of Family Physicians in Providing Cesarean Sections in Rural Communities." *Journal of the American Board of Family Medicine*, vol. 34, no. 1 (2021): 10.

⁴⁰We defined modifiers to quantify stakeholders' views as follows: "some" stakeholders represents more than 0 but less than or equal to 20 percent of responses (1-4 stakeholders); "several" stakeholders represents more than 20 percent but less than or equal to 40 percent of responses (5-8 stakeholders); "many" stakeholders represents more than 40 percent but less than or equal to 60 percent of responses (9-11 stakeholders); "most" stakeholders represents more than 60 percent but less than or equal to 80 percent of responses (12-15 stakeholders); and, "nearly all" stakeholders represents more than 80 percent but less than 100 percent of responses (16-18 stakeholders).

therefore, the level of importance for each factor may be different depending on the particular area.

The seven factors are detailed below in order of the stakeholders' overall rank of importance.

Medicaid reimbursement and coverage. Several stakeholders discussed the financial burden of providing obstetric services, including low rates of Medicaid reimbursement for such services that may have a negative impact, particularly for rural hospitals.

Hospital-based obstetric services can be costly to operate, in large part because of the need for continuous everyday coverage by nursing and physicians trained in obstetric care, according to some stakeholders we interviewed. Several stakeholders, in addition to one research organization and one provider association, said that obstetric units were often the hospital units with the biggest financial losses for the rural hospitals, and thus, first to close when hospitals faced financial difficulties.

Research we reviewed and some stakeholders stated that Medicaid reimbursement rates, which are determined by the states, do not cover the full cost of providing obstetric services to a patient and only pays about 50 percent of what private insurers pay for childbirth-related services.⁴¹ As Medicaid covers a higher proportion of births in rural areas compared to urban areas, Medicaid reimbursement rates may cause rural hospitals to suffer financial losses if they provide obstetric services, according to several stakeholders and researchers from a rural health research program. Some stakeholders also explained that hospitals typically rely on private health insurance payments, non-obstetrical surgical care, and other supporting services to subsidize losses from their obstetric units, all of which rural hospitals usually lack. This makes rural hospitals especially vulnerable to financial losses in providing obstetric care.

Recruiting and retaining clinicians. Some stakeholders emphasized that hospital obstetric units need to be staffed by a full range of maternal health clinicians, including physicians and nurses, as well as

⁴¹See, for example, National Academies of Sciences, Engineering, and Medicine, *Birth Settings in America: Outcomes, Quality, Access, and Choice* (Washington D.C.: The National Academies Press, 2020), 90.

anesthesiologists, and must be staffed all day, every day, even when birth volume is low. Without sufficient staff, some stakeholders emphasized that the hospitals cannot provide such services, and rural hospitals struggle more to recruit staff than urban hospitals.⁴² Some stakeholders explained that recruiting and retaining enough providers to staff obstetric units also relates to financial viability concerns of rural hospitals, as staffing an obstetric unit is one of the most significant costs that rural hospitals face.

Research and several stakeholders noted current workforce shortages for clinicians providing obstetric services across the country and expect more in the future. For example, HRSA estimated that the supply of OB/GYNs in 2018 for rural areas was not sufficient to meet the current demand of women's health services. By 2030, HRSA anticipated the imbalance to grow even more, with the anticipated supply of OB/GYNs expected to meet only about 50 percent of the demand in rural areas.⁴³

Research and many stakeholders also said that fewer medical residents (physicians who have completed medical school and are receiving training in a specialized area) are interested in providing obstetric care due to work-life balance concerns, such as frequent on-call rotations required by obstetric care. They added that rural areas face more challenges with recruiting as they must compete with well-resourced

⁴²One study examining the characteristics of rural hospital-based obstetric services that closed found that the most commonly cited reason was difficulty in finding staff. The study surveyed 306 rural hospitals in nine states with at least 10 births in 2010. The 19 hospitals that reported closing their obstetric units also cited low birth volumes and financial issues, such as low reimbursement and the cost of operating the obstetric services, as reasons for the closures. P. Hung, K.B. Kozhimannil, M.M. Casey, and I.S. Moscovice. "Why are Obstetric Units in Rural Hospitals Closing Their Doors?" *Health Services Research*, vol. 51, no. 4 (2016): 1546.

⁴³HRSA estimates that these current workforce shortfalls are most seen in the regions of the U.S. West, Midwest, and South, and that future shortfalls will be particularly focused in the West and South. HRSA estimates that urban areas had a surplus of OB/GYNs in 2018, but the expected supply will only meet about 95 percent of the demand in 2030. See U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. *Projections of Supply and Demand for Women's Health Services Providers: 2018-2030*. (Rockville, Md.: March 2021). Similarly other researchers also predicted shortages of OB/GYNs as well as general surgeons. For example, see T.E. Williams Jr., B. Satiani, and E.C. Ellison. "A Comparison of Future Recruitment Needs in Urban and Rural Hospitals: The Rural Imperative." *Surgery*, vol. 150, no. 4 (2011): 617.

urban areas for providers.⁴⁴ For example, younger providers may not view rural areas as good places to start or raise families because of the frequent on-call rotations for clinicians providing obstetric services in some rural hospitals, which occurs when there are few physicians to share the call schedule, according to several stakeholders.

Several stakeholders noted that medical residents usually train in larger facilities and work with expert teams and state-of-the-art equipment, making them uncomfortable when moving to rural areas where they do not have similar support. Some of these stakeholders, in addition to other researchers from one rural health research center, further said that having one physician overseeing a facility with low birth volume places a lot of responsibility on that physician, as one bad birth outcome could have significant negative implications for the entire facility; thus, physicians may not want to take on such responsibility.

Lastly, the COVID-19 pandemic also has exacerbated existing challenges in recruiting and retaining clinicians in rural areas, particularly for nursing staff, according to some stakeholders and researchers. For example, some stakeholders said that burnout and stress were causing clinicians to leave their jobs.⁴⁵

Organizational factors. Some stakeholders noted that a hospital's organizational structure and leadership are vital to keeping obstetric care local. They explained that to keep hospital-based obstetric services open despite challenges presented by financial factors and staffing issues, it is important for hospital leadership to prioritize providing obstetric care as a mission of the hospital. When that does not happen, it can lead to closures. Some other stakeholders stated that hospitals should dedicate

⁴⁴See, for example, W.F. Rayburn, J.C. Klagholz, C. Murray-Krezan, L.E. Dowell, and A.L. Strunk. "Distribution of American Congress of Obstetricians and Gynecologists Fellows and Junior Fellows in Practice in the United States." *Obstetrics & Gynecology* vol. 119, no. 5 (2012): 1017.

Additionally, one policy brief shows that while medical schools are increasing class sizes, the number of residency spots in hospitals has not increased, which will only serve to worsen the physician workforce shortage in the future. See U.S. Department of Health and Human Services, HRSA, National Advisory Committee on Rural Health and Human Services. *Maternal and Obstetric Challenges in Rural America: Policy Brief and Recommendations to the Secretary* (Rockville, Md., May 2020).

⁴⁵For more information on the effect of the COVID-19 pandemic on maternal health see, GAO, *Maternal Health: Outcomes Worsened and Disparities Persisted during the Pandemic*, [GAO-23-105871](#) (Washington, D.C.: Oct. 19, 2022).

themselves to matching needs of the local area to maintain support of the communities.

According to some stakeholders and other researchers from a rural health research program, corporate hospital system consolidation also affects rural obstetric care by having new leadership from larger hospital systems take over decision-making and control of local care. They explained that rural hospitals are increasingly becoming subsidiaries of larger hospital systems, which may not prioritize unprofitable or complex services, such as obstetric care, resulting in closures of obstetric units to cut costs.

- Two studies identified relationships between losses of hospital-based obstetric services in rural areas following a hospital merger or following a change to health system affiliation. However, it was not clear if the merger or change in affiliation was behind the closure or if the financial situations leading to the merger or change in affiliation resulted in the obstetric service closure.⁴⁶
- One study also suggested that hospital affiliations may be associated with lower risk of closure for rural hospitals under financial distress, but among financially stable rural hospitals, affiliation is associated with an increased risk in closure.⁴⁷

Training opportunities. Some stakeholders and studies cited that it may be difficult to access obstetric-related training opportunities and maintain staff competency in rural hospitals that have low-birth volumes, especially for high-risk pregnancy situations.⁴⁸ For example, staff may need to travel

⁴⁶R. Mosher Henke, K.R. Fingar, H.J. Jiang, L. Liang, and T. Gibson. "Access to Obstetric, Behavioral Health, and Surgical Inpatient Services After Hospital Mergers in Rural Areas." *Health Affairs*, vol. 40, no. 10 (2021): 1627; and C.E. O'Hanlon, A.M. Kranz, M. DeYoreo, A. Mahmud, C.L. Damberg, and J. Timbie. "Access, Quality, and Financial Performance of Rural Hospitals Following Health System Affiliation." *Health Affairs*, vol. 38, no. 12 (2019): 2095.

Studies also found that hospitals that closed obstetric units were more likely to be critical access hospitals, privately owned, or affiliated with a hospital system. See University of Minnesota Rural Health Research Center, *Rural and Urban Hospital Characteristics*, 2021; K.B. Kozhimannil, et al. *American Journal of Public Health*, 2020; and P. Hung, et al. *Health Services Research*, 2016.

⁴⁷This study also found that for-profit ownership for financially-stable rural hospitals was strongly associated with closures. See H.J. Jiang, K.R. Fingar, L. Liang, and R.M. Henke. "Risk of Closure among Independent and Multihospital-Affiliated Rural Hospitals." *Journal of the American Medical Association Health Forum*, vol. 3, no. 7, (2022).

⁴⁸See, for example, K.B. Kozhimannil, et al. *Journal of Rural Health*, 2015.

long distances for obstetric training, while others attend so few births that they have difficulty maintaining competencies. One study noted that over one-third of rural facilities do not meet the 200 deliveries per year that obstetric unit managers and hospital administrators said were needed to maintain staff competencies in obstetrical care.⁴⁹

Some stakeholders cited that for low-birth-volume facilities, which also tend to have lower budgets, many providers may not have the experience or training needed to react appropriately in emergency situations, as they may rarely encounter particular complications. Maintaining competencies is especially difficult for general surgeons who perform cesarean sections, noted some stakeholders from a provider association, who suggested that these clinicians would benefit from simulation training.⁵⁰

In contrast, another stakeholder said they did not believe that training opportunities significantly affected the availability of rural obstetric care, as remote training is already widely available to providers, especially since the arrival of the COVID-19 pandemic and the increased use of telemedicine.

Medical liability insurance. Many stakeholders, including those representing physicians, said that the cost of provider malpractice coverage is expensive; and while it affects all clinicians, it may exacerbate any existing financial vulnerabilities that rural providers already face in offering obstetric care. Some stakeholders pointed out that many OB/GYNs instead focus solely on gynecology due to the costs of medical liability insurance specific to obstetric care and increased risk in providing these services. Another stakeholder stated that a family physician that provides the full range of primary care without obstetric care would pay half the medical liability insurance premiums as a family physician that also provides obstetric care.

Some stakeholders, in addition to officials from one provider association, said that malpractice insurance limitations may prevent clinicians from

⁴⁹K.B. Kozhimannil, et al. *Journal of the American Medical Association Health Forum*, 2022.

⁵⁰Simulation training offers hands-on practice simulations of critical procedures and skills to prepare rural hospitals for obstetric emergencies. This includes resources like mannequins and other simulation technology. See University of Minnesota Rural Health Research Center. *Health Policy Brief: Emergency Obstetric Training Needed in Rural Hospitals without Obstetric Units*. (Minneapolis, Minn.: University of Minnesota, November 2020).

attending births in multiple facilities, whether for general assistance or training purposes, because their insurance does not cover them at all facilities. They added that this may restrict clinicians from providing care in other rural areas or training in higher volume facilities, which would allow them to increase their birth volumes and continue providing obstetric care in their communities. Some stakeholders stated that an OB/GYN in their area usually needs to perform around 100 deliveries a year to cover the cost of malpractice insurance and that in rural areas, this is often the total number of deliveries a provider will perform; as a result, this may not leave much to cover other expenses.

In addition, some stakeholders explained that even when clinicians have malpractice coverage, the high costs of malpractice case claims may be prohibitive to them practicing in rural areas, as providers may face potentially expensive lawsuits for bad birth outcomes, even in cases when no medical malpractice occurs; these costs may exacerbate the financial issues that rural hospitals and clinicians already face. According to some stakeholders, rural providers may also face higher risks of bad outcomes and therefore malpractice lawsuits because obstetric patients in rural areas experiencing emergency medical conditions may arrive to receive care in relatively poor condition. These patients often may have to travel longer distances to initially receive care, longer distances to be transferred to another facility when needed, and face unpredictable weather in certain regions, according to some stakeholders. Several stakeholders said that for states that do not have a cap on damages for medical malpractice lawsuits, the high costs of these claims may worsen existing financial vulnerabilities for providers in rural areas.

On the other hand, some other stakeholders noted that hospitals employ over 50 percent of physicians in the United States, and since hospitals cover medical liability insurance for their physicians, the cost of medical liability insurance may not be a factor to many physicians in providing obstetric care in rural areas.

Scope of practice requirements for clinicians. Some stakeholders, in addition to officials from a provider association, cited scope of practice—regulations or other requirements that influence the services clinicians can provide—as a factor affecting the availability of certain clinicians, particularly midwives and family physicians, to provide obstetric care in rural areas. They stated that these requirements may limit the number of these clinicians who can provide rural hospital-based obstetric services.

Officials from one provider association stated that credentialing requirements, such as delivering a certain number of babies in a year, can be difficult to meet for family physicians who practice in low-volume hospitals. They explained that such requirements are typically based on delivery numbers in larger, higher-volume urban hospitals, and are not reflective of delivery volumes rural family physicians typically conduct. Such requirements can limit the type of services clinicians are authorized to provide; and family physicians are often the providers that face these types of limits in rural areas, according to one research organization and one provider association, as OB/GYNs and other specialist maternal health providers typically work in hospitals with higher delivery volumes.

Similarly, midwives can be limited by another scope of practice requirement. Certain states' scope of practice laws require collaborative agreements between physicians and midwives or physician supervision of midwives, rather than allowing midwives to practice independently, according to some stakeholders and a policy brief from the National Advisory Committee on Rural Health and Human Services.⁵¹ An official from the American College of Nurse-Midwives stated that restrictive scope of practice requirements was the most important factor prohibiting certified nurse-midwives and certified midwives from providing reproductive health care, including obstetric care, in rural areas within certain parts of the country.⁵² The official explained that prohibiting midwives from practicing at the top of their education, clinical training, and national certification may create unnecessary paperwork for physician signatures, relegate midwives to physician extender roles, or prevent them from attending births (i.e., delivering babies), among other restrictions. Further, the official said that physicians may not want to enter collaborative or supervisory agreements with midwives for multiple reasons, such as concerns about competition from midwives and misunderstanding their liability for the midwives practice. These are barriers that keep midwives from providing care in rural areas, according to officials from the American College of Nurse-Midwives.

⁵¹U.S. Department of Health and Human Services, HRSA, National Advisory Committee on Rural Health and Human Services. *Maternal and Obstetric Challenges in Rural America*, 2020.

⁵²One study that surveyed rural hospitals in 9 states found that certified nurse-midwives attended more births in hospitals in states that allow for autonomous practice. K.B. Kozhimannil, C. Henning-Smith, and P. Hung. "The Practice of Midwifery Care in Rural US Hospitals." *Journal of Midwifery & Women's Health*, vol. 61, no. 4 (2016): 411.

Community factors. Some stakeholders said that rural residents need to use local hospital-based obstetric services to keep them in their communities. Since rural hospitals serve less populous communities than urban hospitals, some provider associations and researchers from a rural health research program stated that rural hospitals often face challenges from low patient volume, and without enough volume, rural hospitals may have to close due to financial difficulties. Some stakeholders emphasized that the patients living in rural areas need to be comfortable with a certain level of risk to use local services that serve a lower volume of patients. For example, a low-risk patient may need to be comfortable delivering in a smaller facility with a lower level of care (i.e., a level 1 facility), while recognizing that there may not be higher-risk care nearby should complications arise. Some stakeholders stated that many rural hospitals face a ‘bypass factor’, where patients with private insurance or financial means may choose to go to a larger hospital farther away, even if the type care provided is nearly the same at the smaller, more local hospital.⁵³ According to some stakeholders, in addition to researchers from a rural health research program, this not only decreases the volume of patients at local facilities, but also increases the proportion of Medicaid patients as they may not be able to travel as easily and thus exacerbates rural hospitals’ financial issues.

Efforts Cited by Stakeholders to Help Increase the Availability of Hospital-Based Obstetric Care in Rural Areas

The 19 stakeholders we interviewed consistently rated the efforts detailed below as the efforts that federal agencies, states, and others could take to most positively affect the availability of hospital-based obstetric care in rural areas, specifically for hospitals and clinicians that provide delivery

⁵³According to one study, hospitals that closed obstetric services between 2010 and 2018 tended to be smaller. Another study showed that hospitals that closed obstetric services tended to have low birth volumes (which a separate study defined as under 240 births annually). One study also identified that rural hospitals that did not provide obstetric services were generally smaller and offered fewer services than hospitals providing obstetric services. See K.B. Kozhimannil, et al. *American Journal of Public Health*, 2020; University of Minnesota Rural Health Research Center, *Closure Affects Less-Populated Rural Counties*, 2017; and University of Minnesota Rural Health Research Center, *Rural and Urban Hospital Characteristics*, 2021.

services.⁵⁴ While each of the stakeholders provided varying rankings for the specific efforts we presented to them, several stated that the appropriateness of each effort may depend on the particular circumstances of the rural hospital or clinicians. Officials from the Agency for Healthcare Research and Quality added that these efforts also need to be viewed with equity in mind to better understand the appropriateness of each effort for all racial and ethnic groups. See appendix IV for information on all the efforts we presented to stakeholders and how they ranked each effort.

Increasing Medicaid reimbursement. Each of the 19 stakeholders we interviewed said increasing Medicaid reimbursement rates for obstetric services would likely have a positive effect on increasing the availability of obstetric care in rural areas. Some stakeholders stated that Medicaid usually pays lower rates than private insurance and does not cover the full cost of providing obstetric care, and according to other researchers, increasing rates would help financially to keep obstetric services open in rural areas.⁵⁵ For example, an official from one provider association stated that the Medicaid payments they received in the past, which

⁵⁴We presented stakeholders with a list of 21 efforts and asked them to rate the efforts based on the effect they thought a particular effort would have on the availability of obstetric care in rural areas. The stakeholders' options were: 1) likely to have a positive effect, 2) likely to have no effect, 3) likely to have a negative effect, and 4) no basis to judge.

We defined modifiers to quantify stakeholders' views as follows: "some" stakeholders represents more than 0 but less than or equal to 20 percent of responses (1-4 stakeholders); "several" stakeholders represents more than 20 percent but less than or equal to 40 percent of responses (5-8 stakeholders); "many" stakeholders represents more than 40 percent but less than or equal to 60 percent of responses (9-11 stakeholders); "most" stakeholders" represents more than 60 percent but less than or equal to 80 percent of responses (12-15 stakeholders); and, "nearly all" stakeholders represents more than 80 percent but less than 100 percent of responses (16-18 stakeholders).

⁵⁵The research we reviewed is somewhat inconclusive about the effects of the prior expansion of Medicaid beginning in 2010, to cover nearly all adults with incomes up to 133 percent of the federal poverty level on the availability of hospital-based obstetric units. One study found that states with more restrictive Medicaid income eligibility were more likely to experience closures of rural hospital-based obstetric services between 2004 and 2014. Yet another study found that Medicaid expansion prevented rural hospital closures more generally, but had little effect on the closure of hospital-based obstetric units specifically. See, P. Hung, et al. *Health Affairs*, 2017; and C. Carroll, J.D. Interarante, J.R. Daw, and K.B. Kozhimannil. "Association between Medicaid Expansion and Closure of Hospital-Based Obstetric Services." *Health Affairs*, vol. 41, no. 4 (2022): 531.

covered the majority of their patients, were not enough to help cover the overhead costs of their practice.

Some stakeholders also noted, however, that private insurance reimbursement rates for obstetric care may be high, making it unfair to compare Medicaid rates to private insurance rates when determining an appropriate reimbursement rate for Medicaid. In addition, one of the stakeholders noted that the federal government also provides some grants and other sources of funding to rural hospitals to help reduce financial burdens, which may help offset low Medicaid rates. CMS and Agency for Healthcare Research and Quality officials added that increasing Medicaid reimbursement rates to cover the full cost of providing obstetric care may not necessarily make up for low volumes of births in hospitals in rural areas.


Despite the agreed-upon positive effect of increasing Medicaid reimbursement for obstetric services, stakeholders disagreed on the feasibility of implementation. Some stakeholders said they believed that increasing reimbursement would have few implementation barriers, as the Medicaid program is already in place and would only require additional funding. However, many other stakeholders stated that increasing Medicaid reimbursement would be a difficult task for the federal government to accomplish, as Medicaid reimbursement rates are largely determined by the states.

Increasing remote consultations. All 19 stakeholders said that increasing the use of remote consultations, such as through video conferencing or phone calls, between specialists and providers for clinical support may have a positive effect on increasing the availability of obstetric care in rural areas. Some stakeholders stated that remote consults are a useful tool for connecting clinicians in hospitals with higher and lower levels of care, thereby allowing patients who live longer distances from higher levels of care to access those services in their own communities. For example, some stakeholders explained that there are many instances where a competent clinician just needs guidance on what to do for a patient presenting with specific symptoms or conditions; there is not always a need have a specialist or sub-specialist working in-person with the patient.

Several stakeholders agreed that expanding the use of remote consultations by clinicians would likely have few barriers for implementation, as the COVID-19 pandemic has already expanded the

usage of technology for remote appointments. (See figure 2 below and appendix III for an example of a program with remote consults.)

Figure 2: Example of Program with Remote Consults

	<p>The University of Arkansas for Medical Services Institute for Digital Health and Innovation High-Risk Pregnancy Program provides access to a call center that is open 24 hours a day, 7 days a week, and provides clinician education, among other things.</p> <p>The call center</p> <ul style="list-style-type: none">• provides remote consults to clinicians throughout most of the state and triage services for obstetrics patients as well.• is staffed by highly trained, experienced nurses with backgrounds in obstetric care. <p>Additionally, the program provides monthly interactive videoconferences with educational information on updates and current practices to implement maternal safety bundles throughout the state.</p>
---	--


Source: GAO interview with the Institute of Digital Health and Innovation's High Risk Pregnancy Program officials and review of relevant documentation (information); A Stockphoto/stock.adobe.com (photo). | GAO-23-105515

Establishing regional partnerships. Nearly all of the 19 stakeholders said that partnerships among hospitals and other facilities in a given region, such as the “hub-and-spoke” model, would likely have a positive effect on increasing the availability of obstetric care in rural areas. Under such a partnership, larger hospitals with more resources (hub) partner with smaller rural hospitals (spokes) for care coordination, and to provide training and other resources to rural areas and help patients receive care in their communities. For example, a specialist from the hub hospital can help manage a rural patient’s high-risk condition as needed and support the rural clinician for planning delivery at the local hospital. Some stakeholders also stated that promoting regional partnerships can help improve health outcomes, and help ensure risk-appropriate care coordination between facilities that provide higher and lower levels of care. Policies and approaches can vary to account for differences in obstetric care infrastructure by geography and rurality and to address varying challenges.

In 2019, HRSA funded its first cohort of Rural Maternity and Obstetrics Management Strategies program awardees with the aim of improving maternal care in rural communities through building networks to coordinate the continuum of care and leveraging telehealth, among other things. Each of the awardees under this program developed networks in their target service areas to increase coordination and access to

obstetrics care. See figure 3 below and appendix III for examples on two styles of regional partnerships under the Rural Maternity and Obstetrics Management Strategies program.

Figure 3: Examples of Programs with Regional Partnerships



The Texas Rural Maternity and Obstetrics Management Strategies Program is similar to a hub-and-spoke model.

- The goal of the program is to improve maternal outcomes and increase local facilities' ability to care for high-risk patients in the community.
- University Health in San Antonio serves as the hub. The regional hospitals and clinics, including Uvalde Memorial Hospital and Val Verde Regional Medical Center, serve as the spokes in the service areas in Texas.
- The hub receives advanced specialty referrals from the spokes and also supports capacity building efforts at the facilities serving as spokes.

The Bootheel Perinatal Network uses a community-oriented model in which all providers in this network share patient referrals and provide one another support and expertise.

- Saint Francis Medical Center leads the large network.
- Other network partners include a regional hospital system (Missouri Delta Medical Center) and a federally qualified health center network (SEMO Health Network), among others.

Source: GAO interviews with the Texas Rural Maternity and Obstetrics Management Program and Bootheel Perinatal Network and review of relevant documentation (information); SeanPavonePhoto/stock.adobe.com (photo). | GAO-23-105515

Financially incentivizing providers to practice in rural areas. Nearly all of the 19 stakeholders said financially incentivizing providers to practice in rural areas would likely have a positive effect on increasing the availability of obstetric care in rural areas. One study shows that the median education debt for medical school graduates in 2019 was usually around \$200,000.⁵⁶ Some stakeholders said programs such as the National Health Service Corps Scholarship and Student Loan Repayment Program can help pay off clinicians' student loans in exchange for several years of service in rural areas (see figure 4 below). However, one stakeholder stated they found it easier for nurses to receive loan repayment from the program, whereas they found it more difficult to secure loan repayment for physicians. In addition, some stakeholders expressed concerns over clinicians leaving rural areas as soon as they meet their service requirements from the National Health Service Corps

⁵⁶The study also found that 73 percent of medical school graduates reported having debt. See Association of American Medical Colleges, *Physician Education Debt and the Cost to Attend Medical School*, (Washington, D.C.: Association of American Medical Colleges, 2020).

or similar programs. (See appendix III for an example of a scholarship student loan repayment program.)

Figure 4: Example of Scholarship and Student Loan Repayment Program



The National Health Service Corps Scholarship and Loan Repayment Program provides funding to clinicians, including obstetricians and gynecologists, family physicians, and certified nurse midwives, that practice in geographic areas deemed as Health Professional Shortage Areas, which include many rural areas. Since 1972, the program has supported over 66,000 primary care clinicians. In fiscal year 2021, there were over 2,800 clinicians that provide obstetric care participating in this program, with 30 percent of them working in rural areas, according to HRSA officials. According to program officials, about 80 percent of program participants remain in their communities for two or more years after completing the program's service obligations.

Source: GAO interview with National Health Service Corps officials and review of relevant documentation (information); terovesalainen/stock.adobe.com (photo). | GAO-23-105515

Rural training tracks. Nearly all of the 19 stakeholders said creating more opportunities for residency training in rural communities would likely have a positive effect on increasing the availability of obstetric care in rural areas. Several stakeholders cited research that found that providers who train in rural areas are more likely to stay in those areas. For example, some stakeholders stated that graduates of family medicine rural training tracks are two to three times more likely to practice in rural areas than graduates of family medicine residencies overall. Some stakeholders emphasized that new physicians today place more importance on lifestyle than previous generations, so it is important to expose them to rural communities to see if they enjoy living there.

Meanwhile, another stakeholder cautioned that having more medical residents or medical students in a hospital requires time and resources from that hospital, so it may be difficult to find additional spots for residents interested in training in rural communities. Researchers from a rural health research center noted that because most of these rural training tracks are small and only graduate around two students a year, they cannot solve the physician workforce shortage problem alone. (See figure 5 below and appendix III for an example of a rural OB/GYN training track program.)

Figure 5: Example of Rural Training Track Program



The University of Wisconsin Obstetrics and Gynecology (OB/GYN) Rural Residency Program started in 2017 and was the first OB/GYN residency program in the country to provide a dedicated rural training track. The program

- provides rotations in areas that the Federal Office of Rural Health Policy designates as rural, with rural rotations amounting to about six months of the four-year residency program.
- currently accepts one rural training track resident per year (the OB/GYN residency program also accepts 6 other non-rural residents per year).
- The program director noted that the amount of time spent in rural and non-rural settings is to balance 1) the number of OB/GYN procedures that OB/GYN medical residents are required to complete and 2) support for the rural training track resident getting a full experience practicing in rural areas.

Because the program does not meet the Medicare requirement of having more than 50 percent of a residency in a rural area to be eligible for additional Medicare graduate medical education funding for rural training tracks, the program relies on funding from the university, partner organizations, and charitable donations to cover the rural resident's training time, transportation and lodging. As of June 2022, both graduates of the rural residency program continue to practice in rural areas in the Midwest, according to the program director.

Source: GAO interview with the University of Wisconsin Medical School OB/GYN Rural Training Track Program Director and review of relevant documentation (information); SeventyFour/stock.adobe.com (photo). | GAO-23-105515

Medicaid payments for non-clinical services. Nearly all stakeholders said expanding Medicaid coverage for non-clinical services, such as payments for doulas and temporary housing, would likely have a positive effect on increasing the availability of obstetric care in rural areas. Some stakeholders stated that covering these costs would help patients pay for the true costs of obstetric care, especially those living in more outlying areas.

One study we reviewed showed that doula care can be effective at improving maternal and infant health and reducing spending on obstetric care, but most state Medicaid programs do not cover doula support.⁵⁷ However, CMS officials told us that more states are planning or considering to add Medicaid coverage for doula care in the future.

Medical liability insurance costs. Nearly all stakeholders said that reducing the costs of medical liability premiums for rural obstetric physicians would likely have a positive effect for increasing the availability of obstetric care in rural areas. Many stakeholders agreed that the costs

⁵⁷N. Strauss, C. Sakala, & M.P. Corry, "Overdue: Medicaid and Private Insurance Coverage of Doula Care to Strengthen Maternal and Infant Health," *The Journal of Perinatal Education*, vol. 25, no. 3 (2016): 145–149.

of medical liability insurance are too high, which exacerbates challenges faced by rural providers with financial vulnerabilities and risks. Some stakeholders stated that with the exception of federally-funded community health centers and Federally Qualified Health Centers, where eligible providers have federal protection from medical liability cases, medical liability insurance is often a significant consideration to hospitals and clinicians when determining whether to provide obstetric services. These stakeholders pointed to the benefits that providers at certain federally-supported health centers receive under the Federal Tort Claims Act, which according to HRSA, extends liability protections to providers employed at these centers for the performance of medical, surgical, dental, or related functions.

However, one stakeholder noted that proposed policies to lower the cost of medical liability insurance premiums only in rural areas may cause other challenges. In particular, the stakeholder noted such lowering of rural malpractice rates may incentivize physicians who cannot afford to get insured elsewhere because of a history of quality issues to move to rural areas that have lowered malpractice insurance rates, thus potentially lowering the quality of care being provided in rural areas.

Agency Comments

We provided a draft of this report to the Department of Health and Human Services, including CMS, HRSA, the Centers for Disease Control and Prevention, and the Agency for Healthcare Research and Quality. HHS also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Health and Human Services, and other interested parties. In addition, the report is available at no charge on the GAO website at <https://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-7114 or hundrupa@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix V.

Sincerely yours,

A handwritten signature in black ink that reads "Alyssa M. Hundrup". The signature is written in a cursive style with a large, stylized initial 'A'.

Alyssa M. Hundrup
Director, Health Care

Appendix I: Objectives, Scope, and Methodology

This report focuses on obstetric care in rural areas, specifically on hospitals and clinicians that provide delivery services. The objectives of this report were to describe: (1) the availability of hospital-based obstetric services in rural areas, (2) stakeholder perspectives on factors that affect the availability of hospitals and clinicians that provide hospital-based obstetric care in rural areas, and (3) stakeholder perspectives on ongoing and proposed efforts federal agencies, states, and others could take to increase the availability of hospitals and clinicians that provide hospital-based obstetric care in rural areas.

To describe the availability of hospital-based obstetric services in rural areas, we first conducted a literature review of relevant research published from 2011 through 2022. We selected these years to capture research from the 10 last years. Specifically, we conducted a structured search of multiple electronic databases, including ProQuest, Scopus, WorldCat, Dialog, EBSCO, and Cochrane Library. Our searches included various terms related to our objectives, including “obstetric,” “rural,” “availability”, and “access,” among others. We limited our search results to English language materials and those focused on the United States. The materials we reviewed included peer-reviewed articles; conference papers; government reports; and association, nonprofit, and think-tank publications.

Our structured search identified 181 articles. Analysts then reviewed the articles to identify those to include in our report that met the following criteria: (1) included original research, (2) included data that was from 2007 or more recent, and (3) were relevant to our engagement objectives. Of the 181 articles we reviewed, we identified 50 that met the criteria for inclusion. Additionally, we also identified another 37 articles that were relevant to our criteria through internet searches, a review of the bibliographies of articles we obtained, and searches of government agency websites. See appendix II for a bibliography of the articles from our structured search and additional searches.

Additionally, we interviewed researchers, including those from three rural health research centers that conduct relevant work; officials from several provider associations that represent clinicians providing obstetric services; and officials from several agencies within the Department of

Health and Human Services—HRSA, CMS, Centers for Disease Control and Prevention, and Agency for Healthcare Research and Quality.¹

To describe stakeholder perspectives on factors that affect the availability of hospitals and clinicians that provide hospital-based obstetric care in rural areas and ongoing and proposed efforts to address such factors, we first identified lists of factors and efforts by conducting a literature review (as described above) and interviewing researchers, provider associations, and federal agencies (as described above). We then conducted semi-structured interviews with 19 selected stakeholders representing provider associations, researchers, patient advocacy organizations, and federal agencies to obtain their perspectives on the list of factors that we initially identified as well as a list of efforts that could be taken to address such factors (see table 1). As part of these interviews, we asked the selected stakeholders to rank the lists of factors from most to least important and rate the efforts based on their perceived effect on the availability of obstetric care in rural areas. We selected these stakeholders to represent a diversity of perspectives and experiences, including those representing different racial and ethnic groups, and from clinicians that provide obstetric care or other clinical care during delivery.

¹Specifically, we interviewed researchers from the North Carolina Rural Health Research Program, which conducts research on hospital closures; the University of Minnesota Rural Health Research Center, which conducts research on maternal health and access; and the Washington, Wyoming, Alaska, Montana, Idaho Rural Health Research Center, which conducts research on the healthcare workforce. In addition, we interviewed researchers from the March of Dimes and National Rural Health Association. In terms of provider associations, we interviewed the American Academy of Family Physicians, American College of Nurse Midwives, and American College of Obstetricians and Gynecologists.

Appendix I: Objectives, Scope, and Methodology

Table 1: Stakeholders for Semi-Structured Interviews, by Category

Type of stakeholder	Name of stakeholder
Federal agencies	Agency for Healthcare Research and Quality
	Centers for Medicare & Medicaid Services
	Health Resources and Services Administration
Researchers	National Rural Health Association
	Commonwealth Fund
Provider associations	American Academy of Pediatrics
	American College of Nurse-Midwives
	American College of Obstetricians and Gynecologists
	American Hospital Association
	American Medical Association
	American Society of Anesthesiologists
	Association of American Medical Colleges
	Association of Women’s Health, Obstetric and Neonatal Nurses
	Critical Access Hospital Coalition
	Medicaid Medical Director Network
	Migrant Clinicians Network
	National Hispanic Medical Association
Patient advocacy organizations	Great Plains Tribal Chairmen’s Health Board
	Six Dimensions

Source: GAO. | GAO-23-105515

Note. The stakeholders are presented in alphabetical order by category. We selected a judgmental sample of stakeholders to represent a diversity of perspectives and experiences, including various clinicians that provide obstetric care and organizations representing different racial and ethnic groups.

In presenting the results of our stakeholder interviews, we used modifiers to quantify stakeholders’ views. When we report the results,

- the term “some” stakeholders represents more than 0 but less than or equal to 20 percent of responses (1-4 stakeholders);
- the term “several” stakeholders represents more than 20 percent but less than or equal to 40 percent of responses (5-8 stakeholders);
- the term “many” stakeholders represents more than 40 percent but less than or equal to 60 percent of responses (9-11 stakeholders);
- the term “most” stakeholders” represents more than 60 percent but less than or equal to 80 percent of responses (12-15 stakeholders); and,

- the term “nearly all” stakeholders represents more than 80 percent but less than 100 percent of responses (16-18 stakeholders).

Lastly, to further describe efforts reported to be effective at increasing the availability of hospital-based obstetric services in rural areas, we identified programs that were reported to be effective at increasing obstetric care availability from researchers and provider associations we interviewed as well as from our literature review. We selected six of these programs to represent varying experiences with the type of entity facilitating the program, scope of effort, demographic groups served, and geographic areas served in the United States. We then interviewed program officials to identify characteristics that made the programs successful as well as challenges they faced. See appendix III for more detailed information about these selected programs.

Appendix II: Bibliography

American College of Nurse-Midwives, National Association of Certified Professional Midwives, National Black Midwives Alliance, National Partnership for Women and Families. *Improving Our Maternity Care Now Through Midwifery*. (Washington, D.C.: National Partnership for Women and Families, October 2021).

American College of Obstetricians and Gynecologists. "Committee Opinion No. 586: Health Disparities in Rural Women." *Obstetrics & Gynecology*, vol. 123, no. 2 Pt 1 (2014): 384-388.

American College of Obstetricians and Gynecologists. "ACOG Committee Opinion No. 798: Implementing Telehealth in Practice." *Obstetrics & Gynecology*, vol. 135, no. 2 (2020): e73-e-79.

Anderson, Britta, Adam Gingery, Maeve McClellan, Robin Rose, David Schmitz, and Pat Schou. *National Rural Health Association Policy Paper: Access to Rural Maternity Care*. (Washington, D.C.: National Rural Health Association, 2019).

Avery, Daniel M., Dwight E. Hooper, John T. McDonald, Michael W. Love, Melanie T. Tucker, and Jason M. Parton. "The Economic Impact of Rural Family Physicians Practicing Obstetrics." *The Journal of the American Board of Family Medicine*, vol. 27, no. 5 (2014): 602-610.

Banke-Thomas, Aduragbemi, Megan Wilson-Jones, Barbara Madaj, and Nynke van den Broek. "Economic evaluation of emergency obstetric care training: a systematic review." *BioMed Central Pregnancy and Childbirth*, vol. 17, no. 403 (2017).

Barnea Eytan, R., Wanda Nicholson, Gerhard Theron, Diana Ramasauskaite, Michael Stark, S. Mark Albin, Anwar H. Nassar, and International Federation of Gynecology and Obstetrics Safe Motherhood and Newborn Health Committee. "From fragmented levels of care to integrated health care: Framework toward improved maternal and newborn health." *International Journal of Gynecology and Obstetrics*, vol. 152 (2021): 155-164.

Barreto, Tyler, Anuradha Jetty, Aimee Eden, Steven Petterson, Andrew Brazemore, and Lars Peterson. "Distribution of Physician Specialties by Rurality." *The Journal of Rural Health*, vol. 37 (2021): 714-722.

Bergh, Anne-Marie, Shisana Baloyi, and Robert C. Pattinson. "What is the impact of multi-professional emergency obstetric and neonatal care

training? *Best Practice & Research Clinical Obstetrics & Gynecology*, vol. 29 (2015): 1028-1043.

Bronstein, Janet M., Songthip Ounpraseuth, Jeffrey Jonkman, Curtis Lowery, David Fletcher, Richard R. Nugent, and Richard W. Hall. "Improving Perinatal Regionalization for Preterm Deliveries in a Medicaid Covered Population: Initial Impact of the Arkansas ANGELS intervention." *Health Services Research*, vol. 46, no. 4 (2011).

Burlone, Suzanne, Lisa Moore, and Wendy Johnson. "Overcoming Barriers to Accessing Obstetric Care in Underserved Communities." *Obstetrics & Gynecology*, vol. 134, no. 2 (2019): 271-275.

Carlough, Martha, Ellen Chetwynd, Sarah Muthler, and Cristen Page. "Maternity Units in Rural Hospitals in North Carolina: Successful Models for Staffing and Structure." *Southern Medical Journal*, vol. 114, no. 2 (2021).

Carroll, Caitlin, Julia D. Interrante, Jamie R. Daw, and Katy Backes Kozhimannil. "Association between Medicaid Expansion and Closure of Hospital-Based Obstetric Services." *Health Affairs*, vol. 41, no. 4 (2022): 531-539.

Centers for Medicare & Medicaid Services. *External Summary: A Conversation on Maternal Healthcare in Rural Communities: Charting a Path to Improved Access, Quality, and Outcomes*. (Baltimore, Md.: June 12, 2019).

Centers for Medicare & Medicaid Services. *Centers for Medicare & Medicaid Services Rural Health Strategy*. (Baltimore, Md.: May 2018).

Centers for Medicare & Medicaid Services. *Issue Brief: Improving Access to Maternal Health Care in Rural Communities*. (Baltimore, Md.: September 3, 2019).

Cohen, Catherine, Matthew Baird, Nirabh Koirola, Ryan Kandrack, and Grant Martsof. "The Surgical and Anesthesia Workforce and Provision of Surgical Services in Rural Communities: A Mixed-Methods Examination." *Journal of Rural Health*, vol. 37 (2021): 45-54.

Corcoran, Lindsay, Catherin Clary, and Sarah Brinkman. *Policy Brief: Rural Obstetric Unit Closures and Maternal and Infant Health*. (Washington, D.C.: National Rural Health Association, February 8, 2021).

Department of Health and Human Services. *Healthy Women, Healthy Pregnancies, Healthy Futures: Action Plan to Improve Maternal Health in America*. (Washington, D.C.: Dec. 2, 2020).

Department of Health and Human Services, National Advisory Committee on Rural Health and Human Services. *Maternal and Obstetric Care Challenges in Rural America: Policy Brief & Recommendations to the Secretary*. (Washington, D.C.: May 2020).

Department of Health and Human Services. *Rural Action Plan*. (Washington, D.C.: September 2020).

Deutchman, Mark, Francesca Macaluso, Emily Bray, David Evans, James Boulger, Kathleen Quinn, Carrie Pierce, et al. "The impact of family physicians in rural maternity care." *Birth*, vol. 00 (2021):1-13.

Duarte, Shirley S., Turc-Anh T. Nguyen, Colleen Koch, Kayode Williams, and Jamie D. Murphy. "Remote Obstetric Anesthesia: Leveraging Telemedicine to Improve Fetal and Maternal Outcomes." *Telemedicine and e-health*, vol. 26, no. 8 (2020).

Eden, Aimee R, and Lars E. Peterson. "Challenges Faced by Family Physicians Providing Advanced Maternity Care." *Maternal and Child Health Journal*, vol. 22 (2018): 932-940.

Fialkow, Michael F., Carrie M. Snead, and Jay Schulkin. "New Partner Recruitment to Rural Versus Urban Ob-Gyn Practices: A Survey of Practicing Ob-Gyns." *Health Services Research and Managerial Epidemiology*, vol. 4 (2017).

Fialkow, Michael F., Carrie M. Snead, and Jay Schulkin. "Benefits and Barriers to Teaching Medical Students in an Ob-Gyn Clinic." *Health Services Research and Managerial Epidemiology*, vol. 5 (2018).

Goldstein, Jessica Taylor, Scott G. Hartman, Matthew R. Meunier, Bethany Panchal, Christine Pecci, Nancy M. Zink, and Sara G. Shields. "Supporting Family Physician Maternity Care Providers." *Family Medicine*, vol. 50, no. 9 (2018): 662-671.

Handley, Sara C., Milly Passarella, Heidi M. Herrick, Julia D. Interrante, Scott A. Lorch, Katy B. Kozhimannil, Ciaran S. Phibbs, and Elizabeth E. Foglia. "Birth Volume and Geographic Distribution of US Hospitals with

Obstetric Services from 2010 to 2018.” *Journal of the American Medical Association Network Open*, vol. 4, no. 10 (2021).

Henke, Rachel Mosher, Kathryn R. Fingar, H. Joanna Jiang, Lan Liang, and Teresa B. Gibson. “Access to Obstetric, Behavioral Health, And Surgical Inpatient Services after Hospital Mergers in Rural Areas.” *Health Affairs*, vol. 40, no. 10 (2021): 1627-1636.

Homan, Fay F., Ardis L. Olson, and Deborah J. Johnson. “A Comparison of Cesarean Delivery Outcomes for Rural Family Physicians and Obstetricians.” *Journal of the American Board of Family Medicine*, vol. 26, no. 4 (2013): 366-72.

Hostetter, Martha, Sarah Klein, and Laurie Zephyrin. *Maternity Care, Interrupted*. (New York, N.Y.: Commonwealth Fund, May 2020).

Hung, Peiyin, Michelle M. Casey, Katy B. Kozhimannil, Pinar Karaca-Mandic, and Ira S. Moscovice. “Rural-urban differences in access to hospital obstetric and neonatal care: how far is the closest one?” *Journal of Perinatology*, vol. 38 (2018): 645-652.

Hung, Peiyin, Carrie E. Henning-Smith, Michelle M. Casey, and Katy B. Kozhimannil. “Access to Obstetric Services in Rural Counties Still Declining, with 9 Percent Losing Services, 2004-14.” *Health Affairs*, vol. 36, no. 9 (2017):1663-1671.

Hung, Peiyin, Katy B. Kozhimannil, Michelle M. Casey, and Ira S. Moscovice. “Why Are Obstetric Units in Rural Hospitals Closing Their Doors?” *Health Services Research*, vol. 51, no. 4 (2016).

Jefferson, Karen, Mary Ellen Bouchard, and Lisa Summers. “The Regulation of Professional Midwifery in the United States.” *Journal of Nursing Regulation*, vol. 11, no. 4 (2021): 26-38.

Jiang, Joanna H., Kathryn R. Fingar Lan-Liang, and Rachel Mosher Henke. “Risk of Closure among Independent and Multihospital-Affiliated Rural Hospitals.” *Journal of the American Medical Association Health Forum*, vol. 3, no.7 (2022).

Kozhimannil, Katy. “Rural-urban differences in childbirth care, 2002-2010, and implications for the future.” *Medical Care*, vol. 52, no.1 (2014).

Kozhimannil, Katy B., Julia D. Interrante, Lindsay K. Admon, and Bridget L. Basile Ibrahim. "Rural Hospital Administrators' Beliefs about Safety, Financial Viability, and Community Need for Offering Obstetric Care." *Journal of the American Medical Association Health Forum*, vol. 3, no. 3 (2022).

Kozhimannil, Katy B., Julia D. Interrante, Mariana S. Tuttle, Mary Gilbertson, and Kristin DeArruda Wharton. "Local Capacity for Emergency Births in Rural Hospitals without Obstetrics Services." *The Journal of Rural Health*, vol. 37 (2021): 385-393.

Kozhimannil, Katy B., Julia D. Interrante, Mariana S. Tuttle, Carrie Henning-Smith, and Lindsay Admon. "Characteristics of US Rural Hospitals by Obstetric Service Availability, 2017." *American Journal of Public Health*, vol. 110, no. 9 (2020).

Kozhimannil, Katy B., Carrie Henning-Smith, and Peiyin Hung. "The Practice of Midwifery in Rural US Hospitals." *Journal of Midwifery & Women's Health*, vol. 61, no. 4 (2016): 411-418.

Kozhimannil, Katy Backes, Julia D. Interrante, Carrie Henning-Smith, and Lindsay K. Admon. "Rural-Urban Differences in Severe Maternal Morbidity and Mortality in the US, 2007-15." *Health Affairs*, vol. 38, no. 12 (2019): 2077-2085.

Kozhimannil, Katy B., Julia D. Interrante, Mariana K. S. Tuttle, and Carrie Henning-Smith. "Changes in Hospital-Based Obstetric Services in Rural US Counties, 2014-2018." *Journal of the American Medical Association*, vol. 324, no. 2 (2020).

Kozhimannil, Katy B., Michelle M. Casey, Peiyin Hung, Xinxin Han, Shailendra Prasad, and Ira S. Moscovice. "The Rural Obstetric Workforce in US Hospitals: Challenges and Opportunities." *Journal of Rural Health*, vol. 31, no. 4 (2015): 365-372.

Kozhimannil, K. B., P. Hung, M.M. Casey, and S.A. Lorch. "Factors associated with high-risk rural women giving birth in non-NICU hospital settings." *Journal of Perinatology*, vol. 36 (2016): 510-515.

Lee, Hyunjung, Ashley H. Hirai, Ching-Ching Claire Lin, and John E. Snyder. "Determinants of rural-urban differences in health care provider visits among women of reproductive age in the United States." *Public Library of Science ONE*, vol. 15, no. 12 (2020).

Lowery, Curtis L., Janet M. Bronstein, Tina L. Benton, and David A. Fletcher. "Distributing Medical Expertise: The Evolution And Impact Of Telemedicine In Arkansas." *Health Affairs*, vol. 33, no. 2 (2014): 235-243.

March of Dimes. *Nowhere to Go: Maternity Care Deserts Across the U.S., 2020 Report*. (Arlington, Va., March of Dimes: 2020).

March of Dimes. *Nowhere to Go: Maternity Care Deserts Across the U.S.* (Arlington, Va., March of Dimes: 2018).

Morken, Colleen, Kimberly Bruksch-Meck, Byron Crouse, and Kara Traxler. "Factors Influencing Rural Physician Retention Following Completion of a Rural Training Track Family Medicine Residency Program." *Wisconsin Medical Journal*, vol. 117, no. 5 (2018): 208-210.

Nuss, Michelle, A., Ben Robinson, and Peter F. Buckley. "A Statewide Strategy for Expanding Graduate Medical Education by Establishing New Teaching Hospitals and Residency Programs." *Academic Medicine*, vol. 90, no. 9 (2015):1264-1268.

North Carolina Rural Health Research Program. *Findings Brief: Health System Challenges for Critical Access Hospitals: Findings from a National Survey of CAH Executives*. (Chapel Hill, N.C., University of North Carolina at Chapel Hill: 2021).

O'Hanlon, Claire E., Ashley E. Kranz, Maria DeYoreo, Ammarah Mahmud, Cheryl L. Damberg, and Justin Timbie. "Access, Quality, and Financial Performance of Rural Hospitals Following Health System Affiliation." *Health Affairs*, vol. 38, no. 12 (2019): 2095-2104.

Page, Cristen P., Ellen Chetwynd, Adam J. Zolotor, George M. Holmes, and Emily M. Hawes. "Building the Clinical and Business Case for Opening Maternity Care Units in Critical Access Hospitals." *New England Journal of Medicine Catalyst*, vol. 2, no. 5 (2021).

Patterson, Davis G., C. Holly A. Andrilla, Lisa A. Garberson. "Preparing Physicians for Rural Practice: Availability of Rural Training in Rural-Centric Residency Programs." *Journal of Graduate Medical Education*, vol. 11, no. 5 (2019): 550-557.

Pearson, Jennifer, Kaitlyn Anderholm, Maren Bettermann, Samantha Friedrichsen, Carolina De La Rosa Mateo, Sara Richter, and Emily Onello. "Obstetrical Care in Rural Minnesota: Family Physician

Perspectives on Factors Affecting the Ability to Provide Prenatal, Labor, and Delivery Care.” *The Journal of Rural Health*, vol. 37 (2021): 362-372.

Peterson, Lars E., Brenna Blackburn, Robert L. Phillips, and James C. Puffer. “Structure and Characteristics of Family Medicine Maternity Care Fellowships.” *Family Medicine*, vol. 46, no. 5 (2014): 354-359.

Pinto, Meredith, Roger Rochat, Monique Hennink, Adrienne D. Zertuche, and Bridget Spelke. “Bridging the Gaps in Obstetric Care: Perspectives of Service Delivery Providers on Challenges and Core Components of Care in Rural Georgia.” *Maternal and Child Health Journal*, vol. 20(2016): 1349-1357.

Rayburn, William F., Jeffrey C. Klagholz, Cristina Murray-Krezan, Lana E. Dowell and Albert L. Strunk. “Distribution of American Congress of Obstetricians and Gynecologists Fellows and Junior Fellows in Practice in the United States.” *Obstetrics & Gynecology*, vol. 119, no. 5 (2012): 1017-1022.

Rayburn, William F., Michael E. Richards, and Erika C. Elwell. “Drive Times to Hospitals with Perinatal Care in the United States.” *Obstetrics & Gynecology*, vol. 119, no. 3 (2012): 611-616.

Rhoads, Sarah J., Hari Eswaran, Christian E. Lynch, Songthip T. Ounpraseuth, Everett F. Magann, and Curtis L. Lowery. “High-risk obstetrical call center: a model for regions with limited access to care.” *The Journal of Maternal-Fetal & Neonatal Medicine*, vol. 31, no. 7 (2018): 857-865.

Schlichting, Lauren E., Tabassum Insaf, George Lui, Ali Zaidi, and Alissa Van Zutphen. “Proximity to risk-appropriate perinatal hospitals for pregnant women with congenital heart defects in New York state.” *BioMed Central Pregnancy and Childbirth*, vol. 20, no. 338 (2020): 1-14.

Simpson, Kathleen Rice. “An overview of distribution of births in United States hospitals in 2008 with implications for small volume perinatal units in rural hospitals.” *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, vol. 40, no. 4 (2011): 432-439.

Smulian, Elizabeth A., Leilah Zahedi, Julie Hurvitz, Abigail Talbot, Audra Williams, Zoe Julian, Adrienne D. Zertuche, and Roger Rochat. “Obstetric Provider Trainees in Georgia: Characteristics and Attitudes about

Practice in Obstetric Provider Shortage Areas.” *Maternal and Child Health Journal*, vol. 20 (2016): 1341-1348.

Spelke, Bridget, Adrienne D. Zertuche, and Roger Rochat. “Obstetric Provider Maldistribution: Georgia, USA, 2011.” *Maternal and Child Health Journal*, vol. 20 (2016): 1333-1340.

Stapleton, Susan Rutledge, Cara Osborne, and Jessica Illuzzi. “Outcomes of Care in Birth centers: Demonstration of a Durable Model.” *Journal of Midwifery & Women’s Health*, vol. 58, no.1 (2013): 3-14.

Sullivan, Margaret H., Sheri Denslow, Kathleen Lorenz, Suzanne Dixon, Emma Kelly, and Kathleen A. Foley. “Exploration of the Effects of Rural Obstetric Unit Closures on Birth Outcomes in North Carolina.” *The Journal of Rural Health*, vol. 37 (2021): 373-384.

Talib, Zohray, Mariellen Malloy Jewers, Julia H. Strasser, David K. Popiel, Debroa Goetz Goldberg, Candice Chen, Hayden Kepley, Fitzhugh Mullan, and Marsh Regenstein. “Primary Care Residents in Teaching Health Centers: Their Intentions to Practice in Underserved Settings after Residency Training.” *Academic Medicine*, vol. 93, no. 1 (2018): 98-103.

Taporco, Jason S., Elizabeth Wolfe, Gabriela Chavez, Zev Allen, Jasmine Estrada, Kelly Thomson, Jennifer Mettling, and Michael Kennedy. “Kansas maternity deserts: a cross-sectional study of rural obstetric providers.” *Rural and Remote Health*, vol. 21, no.1 (2021): 6137.

Thorsen, Maggie L., Sean Harris, Ronald McGarvey, Janelle Palacios, and Andreas Thorsen. “Evaluating disparities in access to obstetric services for American Indian women across Montana.” *The Journal of Rural Health*, vol. 38 (2022): 151-160.

Tong, Sebastian T., Aimee R. Eden, Zachary J. Morgan, Andrew W. Bazemore, and Lars E. Peterson. “The Essential Role of Family Physicians in Providing Cesarean Sections in Rural Communities.” *Journal of the American Board of Family Medicine*, vol. 34, no. 1 (2021): 10-11.

University of Minnesota Rural Health Research Center. *Policy Brief: Closure of Hospital Obstetric Services Disproportionately Affects Less-Populated Rural Counties*. (Minneapolis, Minn., University of Minnesota: April 2017).

University of Minnesota Rural Health Research Center. *Policy Brief: Emergency Obstetric Training Needed in Rural Hospitals without Obstetric Units*. (Minneapolis, Minn., University of Minnesota: November 2020).

University of Minnesota Rural Health Research Center. *Policy Brief: State Variability in Access to Hospital-Based Obstetric Services in Rural U.S. Counties*. (Minneapolis, Minn., University of Minnesota: April 2017).

University of Minnesota Rural Health Research Center. *Policy Brief: State and Regional Differences in Access to Hospital-Based Obstetric Services for Rural Residents, 2018*. (Minneapolis, Minn., University of Minnesota: August 2021).

University of Minnesota Rural Health Research Center. *Policy Brief: State Variations in the Rural Obstetric Workforce*. (Minneapolis, Minn., University of Minnesota: May 2016).

University of Minnesota Rural Health Research Center. *Methodology Brief: An Enhanced Method for Identifying Hospital-Based Obstetric Unit Status*. (Minneapolis, Minn., University of Minnesota: January 2022).

University of Minnesota Rural Health Research Center. *Policy Brief: Rural and Urban Hospital Characteristics by Obstetric Service Provision Status, 2010-2018*. (Minneapolis, Minn., University of Minnesota: April 2021).

University of Minnesota Rural Health Research Center. *Policy Brief: Obstetric Services and Quality among Critical Access, Rural, and Urban Hospitals in Nine States*. (Minneapolis, Minn., University of Minnesota: June 2013).

University of Minnesota Rural Health Research Center. *Policy Brief: Obstetric Emergencies in Rural Hospitals: Challenges and Opportunities*. (Minneapolis, Minn., University of Minnesota: September 2020).

Waits, John B., Lacy Smith, and Daniel Hurst. "Effect of Access to Obstetrical Care in Rural Alabama on Perinatal, Neonatal, and Infant Outcomes: 2003-2017." *Annals of Family Medicine*, vol. 18, no. 5 (2020): 446-451.

Washington, Wyoming, Alaska, Montana, Idaho Rural Health Research Center. *Policy Brief #168: The Supply and Rural-Urban Distribution of the*

Obstetrical Care Workforce in the U.S. (Seattle, Wash., University of Washington, 2020).

Washington, Wyoming, Alaska, Montana, Idaho Rural Health Research Center. *Data Brief #168: The Supply and Rural-Urban Distribution of the Obstetrical Care Workforce in the U.S.: A State Level Analysis.* (Seattle, Wash., University of Washington: 2020).

Weigel, Paula A.M., Fred Ullrich, and Marcia M. Ward. "Rural Bypass of Critical Access Hospitals in Iowa: Do Visiting Surgical Specialists Make a Difference?" *The Journal of Rural Health*, vol. 34 (2018): s21-s29.

Wendling, Andrea, Valerie Taglione, Rachel Rezmer, Poe Lwin, Jessica Frost, Julia Terhune, and Jean Kerver. "Access to maternity and prenatal care services in rural Michigan." *Birth*, vol. 48 (2021): 566-573.

Williams, Thomas E., Jr., Bhagwan Satiani, and E. Christopher Ellison. "A comparison of future recruitment needs in urban and rural hospitals: The rural imperative." *Surgery*, vol. 150, no. 4 (2011): 617-625.

Xierali, Imam M., Marc A. Nivet, and William F. Rayburn. "Relocation of Obstetrician-Gynecologists in the United States, 2005-2015." *Obstetrics & Gynecology*, vol. 129, no. 3 (2017): 543-550.

Appendix III: Successes and Challenges from Selected Programs

Below we present information on six selected programs that researchers and provider associations we interviewed identified as effective at increasing obstetric care availability in rural areas for hospitals and clinicians that provide delivery services. We selected six of these programs to represent varying experiences with the type of entity facilitating the program, scope of effort, demographic groups served, and geographic areas served in the United States. In addition to descriptions of each program, we include information from program officials on characteristics that made the programs successful as well as challenges the programs faced.

Selected Programs

Bootheel Perinatal Network. This program is an example of a community-oriented regional partnership model, located in southeastern Missouri, in which all providers in the network share patient referrals and provide one another support and expertise. The program received a grant in 2019 from the Health Resources and Services Administration's (HRSA) Rural Maternity and Obstetrics Management Strategies program to help establish this network as well as achieve other program goals, including expanding training opportunities, extending racial equity educational programs, and using telehealth to provide prenatal and postpartum clinic care and support services.

National Health Service Corps Scholarship and Loan Repayment Program. This program provides funding to clinicians, including obstetricians and gynecologists (OB/GYN), family physicians, and certified nurse-midwives, that practice in geographic areas deemed as Health Professional Shortage Areas, which include many rural areas. Since 1972, the program has supported over 66,000 primary care clinicians. In fiscal year 2021, there were over 2,800 clinicians that provide obstetric care participating in this program, with 30 percent of them working in rural areas, according to HRSA officials. They added that about 80 percent of program participants remain in their communities for two or more years after completing the program's service obligations.

Texas Rural Maternity and Obstetrics Management Strategies Network Program. This program is a regional partnership using a hub-and-spoke model. The goal of the program is to improve maternal outcomes and increase local facilities' ability to care for high-risk patients in the community, according to program officials. The program received a grant in 2019 from HRSA's Rural Maternity and Obstetrics Management Strategies program to establish a network as well as support other program goals. Such goals include recruiting new staff to bolster network capacity, implementing enhanced perinatal case management services,

and providing telehealth consultation and training.¹ The hub receives advanced specialty referrals from the spokes and also supports capacity building efforts at the spoke facilities.

University of Arkansas for Medical Services Institute for Digital Health and Innovation High-Risk Pregnancy Program. This multi-faceted program is designed to be a support network for high-risk obstetric patients and providers in Arkansas. The program provides remote consultations through a call center, education and support for obstetric clinicians, and case management for patients, among other things. According to the program officials, the call center is open 24 hours a day, 7 days a week and staffed by highly trained, experienced nurses with backgrounds in obstetric care.

University of Wisconsin OB/GYN Rural Residency Program. This program started in 2017 and was the first OB/GYN residency program in the country to provide a dedicated rural training track. The university currently accepts one rural training track resident and six other non-rural residents per year as part of its OB/GYN residency program. The program provides rotations in areas that HRSA's Federal Office of Rural Health Policy designates as rural, with about 6 months of rural rotations during the four-year residency program. The program director noted that the amount of time the rural training track resident spends in rural and non-rural settings is to balance 1) the number of obstetric and gynecologic procedures that OB/GYN medical residents are required to complete and 2) support for the rural training track resident getting a full experience of practicing in a rural area.

West Virginia Perinatal Partnership. This organization is a statewide collaborative that conducts outreach, education, and quality improvement programs to obstetric clinicians and perinatal nurses in West Virginia to help improve access to and quality of care, according to a program official. The organization received an award in 2021 from HRSA's Rural Maternity and Obstetrics Management Strategies program to establish a regional network—the West Virginia Rural Maternity and Obstetric Management Strategies Collaborative—to increase access to maternal and obstetric care within the target service area. As of August 2022, the

¹University Health in San Antonio serves as the hub. The regional hospitals and clinics, including Uvalde Memorial Hospital and Val Verde Regional Medical Center, serve as the spokes in the service areas in Texas.

program is in its planning year, to set up its network and prepare to implement program activities.

Characteristics of Successful Programs

Program officials identified the following common characteristics that made their programs successful at increasing the availability of hospital-based obstetric care in the rural areas where they worked.

Relationships. Officials from five programs cited relationships with hospital administrators and clinicians as important to the success of a variety of types of programs, including an outreach and education program, partnerships, and an OB/GYN residency rural training track. For example:

- An official from an outreach and education program cited relationships with clinicians and nursing leaders as being instrumental in appropriately targeting education to meet the needs of specific hospitals and staff. The staff are able to get ideas for specific skills that require practice drills and updated information to assure that they are meeting new standards of care.
- Another official from a rural training track program said that strong investment in the relationships with hospitals participating in their residency program directly affects a positive and supportive experience for residents, which has ultimately led to graduates continuing to practice in rural areas.
- Officials from a regional partnership program also described pre-existing relationships that the “hub” hospital had with other facilities in the region (“spokes”) as instrumental in the success of setting up their regionalized partnership.

Dedicated leader or staff. Officials from four programs cited the importance of program staff—whether that be the presence of a dynamic leader or programmatic staff with the right skills and dedication. For example:

- An official from a rural training track program attributed the success of the program to having a dedicated leader that makes time, puts in the effort, and has the drive to work for the program’s success.
- Officials from a regional partnership program attributed much of the program’s success to dedicated program staff with (1) knowledge of obstetric services and available local resources and (2) the ability to effectively listen and get at the root-cause of what is hindering access for each patient.

Funding. Officials from four programs cited adequate funding as enabling the programs to function effectively, particularly for those that provide loan repayments and scholarships. For example:

- Officials from a loan repayment program attributed the success of the program to the availability of program funding that influences the number of awards the program can provide. In particular, the officials said that an \$800 million appropriation from the American Rescue Plan Act of 2021 allowed the program to fund all scholarship and loan repayments applicants in most designated Health Professional Shortage Areas in 2021.² The officials said in previous years, the program had only provided funding to applicants that were serving in the highest need Health Professional Shortage Areas.
- Officials from a program providing remote consults cited prior grant funding investing in telemedicine as laying the groundwork that enabled the program to be successful at providing training and support to rural clinicians. The officials said that having the infrastructure to do remote consults and telemedicine has been a “game changer” for rural communities in their state.
- An official from the rural training track program said that securing funding from various sources has allowed the program to successfully continue. Due to needs of the program to meet high volumes of procedures to fulfill medical resident educational requirements and also practice in rural areas where there are not high volumes of patients, the residents do not spend more than 50 percent of their time in rural areas, according to the program official. As a result, the official said the program is not eligible for additional Medicare graduate medical education funding for rural training track participants.³ Instead the official said the program must use other sources of funding, such as from the university, charitable gifts, and the residency sites.

²Pub. L. No. 117-2, § 2602, 135 Stat. 4, 44.

³Medicare offers graduate medical education payments to teaching hospitals to partially offset the costs of training full-time equivalent medical residents, up to a capped number of resident slots for each hospital. For most hospitals, caps reflect the number of residents that Medicare funded in 1996; for hospitals starting their first new GME program in 1997 or later, caps were based on the number of Medicare-funded residents trained at the end of a specific time window. Urban teaching hospitals may receive additional Medicare funding beyond its Medicare-funded graduate medical education cap if residents in their rural training track programs train for more than 50 percent of their time in a rural hospital or at rural non-hospital sites.

Outreach/marketing. Officials from four programs cited community outreach and marketing to advertise their programs and partners as important to program success. For example:

- Officials from the remote consult program noted that outreach and marketing helped to get clinicians to use the program. Going into the community and explaining the program helps to build awareness and understanding of how beneficial the program can be, according to program officials.
- An official from the rural training track program noted that publicizing the program helps to bring attention to the program, including for the rural hospitals that partnered for residencies. The official noted that the program receives significantly more applicants than they have spots (212 applicants for one spot in 2021, according to the official).

Challenges Faced by Selected Programs

Program officials also identified the following common challenges encountered by the various programs that affect their ability to increase the availability of obstetric care in rural areas.

Recruiting and retaining providers or hospital partners. Officials from four programs cited challenges with recruiting and retaining clinicians or hospital partners. Among other things, officials said these challenges are related to recruiting clinicians that are comfortable practicing in rural areas as well as competition among hospitals in the region. Officials from one regional partnership program noted that two hospitals left their network because of competition between them. In particular, the officials noted that concerns that hospitals would take away each other's patients hindered the ability of the hospitals to work together in their regionalized network.

Funding. Officials from three programs also stated that funding was the primary challenge, particularly for keeping the program operational or for expanding the program to meet the community needs identified by the program.

Additionally, some of the challenges cited by the programs were very specific to the nature of each program:

- Officials from two regional partnership programs discussed challenges with setting up data-sharing mechanisms amongst the network partners. In particular, there were difficulties with trying to get similar data from hospitals and facilities using different electronic health record systems and in setting up information exchange systems.

HRSA officials said that because of such challenges with the first cohort of Rural Maternity and Obstetrics Management Strategies program grantees, the agency strongly encouraged the applicants for fiscal year 2021 funding to include a data coordinator in their proposed programs.

- Officials from the loan repayment program said that they were required to consider OB/GYNs and other obstetrician clinicians along with primary care clinicians, meaning they could not prioritize clinicians providing obstetric services over other types of clinicians.

The loan payment program officials noted that the Improving Access to Maternity Care Act requires HRSA to develop Maternity Care Health Professional Target Areas that will prioritize scholarship and student loan repayment funding to clinicians providing obstetric services along with other mandated priorities.⁴ HRSA published a *Federal Register* notice in May 2022 that finalized the criteria used to identify Maternity Care Health Professional Target Areas within new and existing Primary Care Health Professional Shortage Areas.⁵ HRSA expects to begin using the Maternity Care Health Professional Target Area criteria as it makes scholarship and student loan repayment funding decisions in fiscal year 2023.

⁴Pub. L. No. 115-320, § 2, 132 Stat. 4437 (2018).

⁵87 Fed. Reg. 30,501 (May 19, 2022).

Appendix IV: Stakeholders’ Perspectives on Efforts to Address the Availability of Hospital-Based Obstetric Care in Rural Areas

This appendix provides information on perspectives of 19 selected stakeholders on a list of efforts we identified that federal agencies, states, and others could take to address factors affecting the availability of hospital-based obstetric care in rural areas, specifically for hospitals and clinicians that provide delivery services. (See appendix I for a list of selected stakeholders and additional information on our scope and methodology.)

Stakeholders provided ratings for each effort’s perceived effect on the availability of obstetric care in rural areas, as: 1) likely to have a positive effect, 2) likely to have no effect, 3) likely to have a negative effect, or 4) no basis to judge. Table 2 displays the count of stakeholder ratings for each of these efforts (not including counts of “no basis to judge”).

Table 2: Count of Stakeholders’ Ratings for 21 Identified Efforts that Could Affect the Availability of Hospital-Based Obstetric Care in Rural Areas

Effort	Counts of Stakeholders		
	Positive effect	Negative effect	No effect
Increase Medicaid payments for obstetrics care	19	0	0
Increase use of telemedicine/remote consults between providers and specialists	19	0	0
Promote partnerships among hospitals and/or providers, such as “hub-and-spoke” models and consults between providers for higher-risk obstetric consultations	18	0	0
Financially incentivize providers to practice in rural communities, such as expanding funding of the National Health Service Corps loan repayment program and/or its associated sites in rural areas.	18	1	0
Create more opportunities for residency training in rural communities, such as rural training tracks in medical school and graduate medical education	17	0	1
Reduce costs of medical liability premiums for rural obstetric physicians	16	0	1
Expand Medicaid coverage for non-clinical services (e.g., temporary housing and doulas)	16	0	3
Expand medical liability insurance coverage beyond the hospital that providers practice at to cover other hospitals, allowing for rotations and training as needed	15	0	1
Establish tiered training systems for residents to allow for advanced training in obstetric care, such as advanced maternity care training for family medicine residents who are interested in providing prenatal/intrapartum care	14	0	2
Provide cost-based reimbursement from Medicaid for critical access hospitals	14	0	2
Create rotations for rural providers to spend time practicing in higher volume hospitals	13	0	3
Train emergency responders on obstetrics care to be “obstetric ready”	13	0	6
Increase the Medicaid income eligibility threshold for pregnant women	13	1	2

Appendix IV: Stakeholders' Perspectives on Efforts to Address the Availability of Hospital-Based Obstetric Care in Rural Areas

Effort	Counts of Stakeholders		
	Positive effect	Negative effect	No effect
Establish additional accredited midwifery education programs separate from schools of nursing for educating and training masters and/or doctoral level certified nurse-midwives and certified midwives	12	0	2
Increase funding for graduate medical education programs to support medical residents	12	0	5
Standardize scope of practice across states for midwives with accredited education	11	0	4
Assess the impacts of mergers, acquisitions, or closures of obstetrics units and hospitals and address, as needed	9	0	7
Incentivize the creation of free-standing birth centers	8	3	4
Create physician exchange programs between hospitals to increase delivery volumes for rural providers in low volume areas	7	0	7
Incentivize continuing medical education	7	0	10
Standardize scope of practice laws and eligibility requirements for providers	6	0	9

Source: GAO analysis of stakeholder interviews. | GAO-23-105515

Notes: We identified these steps that could address the factors that affect the availability of obstetrics care in rural areas through our literature review and interviews with researchers, provider associations, and federal agencies. These steps are focused on hospitals and clinicians that provide delivery services. We then had 19 selected stakeholders rate these steps as having a positive, negative, or no effect on the availability of obstetrics care or “no basis to judge.” The 19 selected stakeholders represent provider associations, researchers, patient advocacy organizations, and federal agencies. We selected these stakeholders to represent a diversity of perspectives and experiences, including those representing different racial and ethnic groups and clinicians that provide obstetric care.

Counts for each effort may not add up to 19 because we did not include the count of stakeholders who provided a “no basis to judge” option for the efforts.

Seven of the 21 efforts had the highest count of “likely to have a positive effect” ratings from stakeholders, as described in this report. The remaining 14 efforts received mixed ratings. The following is additional information on some efforts that received mixed ratings:¹

Physician exchange programs. Some stakeholders stated that physician exchange programs can help bring rural physicians from low-birth-volume locations to larger hospitals with higher birth volume and

¹In presenting the results, we used modifiers to quantify stakeholders’ views. Specifically, “some” stakeholders represents more than 0 but less than or equal to 20 percent of responses (1-4 stakeholders); “several” stakeholders represents more than 20 percent but less than or equal to 40 percent of responses (5-8 stakeholders); “many” stakeholders represents more than 40 percent but less than or equal to 60 percent of responses (9-11 stakeholders); “most” stakeholders” represents more than 60 percent but less than or equal to 80 percent of responses (12-15 stakeholders); and, “nearly all” stakeholders represents more than 80 percent but less than 100 percent of responses (16-18 stakeholders).

more high-risk cases, which enables them to refresh their skills and training in providing obstetric care. However, some stakeholders emphasized that these exchange programs are limited by the capacity of clinicians in the area, especially for regions that already face clinician shortages. Several other stakeholders said that such exchanges may lead to problems of coverage at the rural physicians' home facilities while they are away. Lastly, some stakeholders stated that from the patient perspective it may not be preferable to see different providers who are rotating around for their delivery care.

Free-standing birth centers. Some stakeholders said that free-standing birth centers are a key part of the regionalization of care, and some others noted that birth centers can also help address issues in birth outcomes for non-White racial and ethnic groups specifically by providing a community-based model of care. However, some other stakeholders stated that birth centers require hospitals to be nearby to transfer higher-risk patients if needed, so birth centers may not do much to increase the availability of hospital-based obstetric care in rural areas. Researchers from one organization also stated that because of the need to be close to hospitals, most birth centers are adjacent to metropolitan areas. Lastly, some stakeholders also expressed concerns that birth centers may not always be well-regulated in certain states and may not provide care at an adequate safety level.

Scope of practice requirements for clinicians. Some stakeholders stated that expanding the scope of practice requirements for midwives to allow them to practice independently without physician supervision would increase the availability of midwives that could provide obstetric care. Some stakeholders also emphasized that for family physicians, maintaining or expanding their scope of practice through rotations or training can maintain and improve their skills, such as for performing caesarean sections. This could allow more family physicians to perform procedures for higher-risk patients and keep credentialing to deliver babies in low-volume settings, according to these stakeholders. However, some stakeholders expressed concerns that changing scope of practice regulations to expand the care that certain clinicians can provide may decrease the quality of care provided. Some other stakeholders stated that standardizing scope of practice across the country could potentially limit providers if the standardization is based on the states with more restrictive scopes. Lastly, several stakeholders agreed that expanding the scope of practice for providers across the nation is difficult for the federal government to accomplish, as scope of practice laws are enacted at a state level.

Appendix V: GAO Contact and Staff Acknowledgements

GAO Contact

Alyssa M. Hundrup, (202) 512-7114 or hundrupa@gao.gov

Staff Acknowledgement

In addition to the contact named above, Raymond Sendejas (Assistant Director), Rebecca Hendrickson (Analyst-in-Charge), Claire Liu, Jeanne Murphy Stone, Ebony Russ, and Sydney Wilson made key contributions to the report. Also contributing were Jennie Apter, Leia Dickerson, Emily Wilson Schwark, Ravi Sharma, and Nicole Willis.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through our website. Each weekday afternoon, GAO posts on its [website](#) newly released reports, testimony, and correspondence. You can also [subscribe](#) to GAO's email updates to receive notification of newly posted products.

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <https://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

Connect with GAO

Connect with GAO on [Facebook](#), [Flickr](#), [Twitter](#), and [YouTube](#).
Subscribe to our [RSS Feeds](#) or [Email Updates](#). Listen to our [Podcasts](#).
Visit GAO on the web at <https://www.gao.gov>.

To Report Fraud, Waste, and Abuse in Federal Programs

Contact FraudNet:

Website: <https://www.gao.gov/about/what-gao-does/fraudnet>

Automated answering system: (800) 424-5454 or (202) 512-7700

Congressional Relations

A. Nicole Clowers, Managing Director, ClowersA@gao.gov, (202) 512-4400, U.S. Government Accountability Office, 441 G Street NW, Room 7125, Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, DC 20548

Strategic Planning and External Liaison

Stephen J. Sanford, Managing Director, spel@gao.gov, (202) 512-4707
U.S. Government Accountability Office, 441 G Street NW, Room 7814,
Washington, DC 20548

