Rural to Referral: Assessing the Obstetric Workforce Landscape in the State of Maine

The Maine Rural
Maternity & Obstetrics
Strategies Network

January 2025

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This assessment was contracted by MaineHealth to the Roux Institute at Northeastern University. It was supported by Rural Maternity and Obstetrics Management Strategies (RMOMS) grant number UK9RH46984, through the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS). The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement by, HRSA, HHS, or the U.S. Government. For more information, please visit HRSA.gov.

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The authors of the report wish to thank the staff, providers, stakeholders, and other partners who shared stories, suggestions, and valuable insights for this assessment.

Executive Summary

This report presents findings from two complementary studies conducted in summer and fall 2024 examining Maine's rural obstetric care system from the perspectives of major referral hospitals and recently closed obstetric units. These studies build upon our previous assessment of the rural obstetric workforce completed in 2023, which documented both challenges and innovative approaches to maintaining obstetric services in rural Maine hospitals.

The first study described in this report explored how Maine's six major referral hospitals engage with and support rural obstetric units through key informant interviews with administrators, providers, nurses, and state-level actors. The findings revealed that referral hospitals face significant pressure in their dual role of providing both routine and complex obstetric care while also serving as training and support hubs for rural providers. While interviewees strongly supported recommendations from our previous study—particularly regarding immersion training, telehealth expansion, and enabling practice to full scope of licensure—they expressed concerns about implementation challenges given their already strained capacity.

The second study examined three rural hospitals that recently closed their obstetric units through key informant interviews with former staff and administrators. The findings highlighted how declining birth volumes combined with staffing challenges ultimately led to the decision to close. Interviewees emphasized the importance of adequate transition time for planning continuity of care, preparing emergency services, and managing communication with staff and communities impacted by the closure. They also stressed the ongoing need to maintain emergency obstetric capabilities even after closure, as pregnant patients continue to present for care.

Together, these studies underscore the complex challenges facing Maine's rural obstetric care system while pointing toward opportunities for improvement through enhanced coordination, targeted workforce development, and creative solutions for maintaining access to safe, high-quality maternity care throughout the state. The recommendations focus on strengthening statewide coordination of perinatal care, supporting rural hospitals in maintaining obstetric services, and ensuring appropriate emergency capabilities in areas where obstetric units have closed.

Commonly used terminology

Obstetric services (OB services): The diverse array of perinatal (prenatal, labor, delivery, and postnatal) care services, both in-patient and outpatient; this report focuses on in-patient services.

Obstetric unit (OB unit): This term refers to the range of obstetric services provided in hospital settings, including where those services are delivered and the team responsible for them. For consistency in this report, this term will be used in lieu of other common terms such as labor/delivery/recovery/postpartum (LDRP) unit, hospital-based obstetric care, and obstetric services.

Obstetric workforce (OB workforce): The array of trained personnel who participate in the direct care of pregnant and postpartum patients, including but not limited to Anesthesiologists, Certified Nursing Assistants (CNA), Certified Nurse-Midwives (CNM), Certified Registered Nurse Anesthetists (CRNA), Emergency Medical Technicians (EMT), Lactation Consultants (LC), Licensed Practical Nurses (LPN), Licensed Clinical Social Workers (LICSW), MDs/DOs (Anesthesiologists, Family Practice physcicians, OB-GYNs, Pediatricians, and others including Emergency Medicine, Maternal Fetal Medicine (MFM), and Psychiatric specialists), Nurse Practitioners (NP), Physician Assistants (PA), Registered Nurses (RN), Respiratory Therapists, Ultrasound Technologists, etc.). This report focuses on the hospital-based OB workforce, but it recognizes that other trained and community-based individuals provide essential care to pregnant and postpartum people in the community.

Perinatal: The time period leading up to and after birth, including up to several months prior to pregnancy and a year (or more) after birth.

Pregnant people: All individuals, regardless of gender, who are pregnant.

Rural: In the United States, the term "rural" is defined and used in various ways by different federal agencies. The RMOMS scope includes areas designated as rural by the Federal Office of Rural Health Policy. However, when referring to other data sources, such as census estimates or CDC natality data, the definition of rural or metro/urban used by those specific sources applies; this is made explicit in the text and figure captions.

Trial of labor after cesarean section (TOLAC): A current term that is an alternative to the term vaginal birth after cesarean section (VBAC).

Background

The landscape of obstetric care in the United States has undergone significant transformation in recent decades, marked by widespread closures of obstetric units, particularly in rural areas. By 2020, half of US counties lacked hospitals offering obstetric services (GAO, 2022), with 89 rural hospital obstetric units closing between 2015 and 2018 alone (AHA, 2022). Maine's experience reflects this national trend, with challenges stemming from its unique demographic profile as the state with the highest average age (45) and second-highest proportion of rural residents (61%) (Census 2020).

The closure of obstetric units in Maine has been particularly striking, with more than a dozen units closing since 1970, half of these in the past decade. These closures occur against a backdrop of declining birth rates, which have fallen by more than half since 1960, though recent years have seen a modest rebound concentrated in metro areas. Simultaneously, the medical needs of pregnant patients have become more complex, with significant increases in conditions such as chronic hypertension (from 1.2% in 2008 to 9.1% in 2023) and pregnancy-associated hypertension (from 5.1% to 12.1%) (CDC Wonder, 2023).

Our first report for the Maine Rural Maternity and Obstetrics Management Strategies (RMOMS) program examined the current needs of the hospital-based obstetric workforce in rural Maine through site visits to 15 participating hospitals and extensive interviews with healthcare providers and administrators (Keefe-Oates et al., 2024). This assessment revealed both strengths and challenges: while the rural obstetrics workforce demonstrated a profound commitment to their communities and innovative approaches to care delivery, they faced significant challenges due to declining birth rates, an aging workforce, and limited opportunities for skill maintenance and enhancement because of low birth volumes. The report culminated in a comprehensive set of multilevel recommendations designed to support and sustain the rural obstetric workforce (Appendix Figure 1; see also Box 1). These recommendations span state, regional, health system, hospital, and unit levels, focusing on critical areas such as financial incentives for rural clinical practice, expanding telehealth and specialist consultation support, and developing innovative workforce training strategies. Key approaches include creating formal mentorship programs, establishing obstetric residency tracks with a rural health focus, supporting cross-training of healthcare professionals, developing strategies for sharing obstetric providers and staff across hospitals, and supporting healthcare providers at all levels in practicing to the full extent of their licensure and training. The recommendations also emphasized the importance of professional development, creating supportive work environments, and establishing communities of practice that allow hospitals to share successes and collaborate on addressing shared challenges in maintaining high-quality obstetric care in rural settings.

To contextualize Maine's rural obstetric care system and the findings and recommendations from the previous report (Keefe-Oates et al., 2024), in summer and fall of 2024 our research team carried out two subsequent studies to gain the perspectives of Maine's major referral hospitals (larger hospitals with higher levels of maternity and newborn care that receive patients from rural areas) and recently closed obstetric units. This report summarizes both of those studies, with the aim of providing a more comprehensive view of the challenges and opportunities in maintaining a robust system of maternity care across rural Maine. Understanding these complementary perspectives is valuable for developing sustainable solutions that can help ensure access to safe, high-quality maternity care throughout the state's rural communities.

Study 1: Referral Hospital Perspectives

The role of referral hospitals has become increasingly vital in maintaining a functional obstetric care system across rural Maine. These hospitals not only provide specialized care for high-risk patients but also can serve as training and support hubs for rural providers and other rural healthcare team members. As the medical needs of pregnant patients become more complex, with rising rates of conditions such as hypertension and obesity, the relationship between rural hospitals and referral hospitals becomes even more critical. These larger facilities can offer essential support through multiple channels: providing clinical training opportunities for rural nurses and providers, offering telehealth consultations for complex cases, and maintaining open lines of communication for emergency transfers and consultations.

Study 1 Objective: Document how the workforce at major referral hospitals in Maine engages with rural obstetric units and their perspectives on interventions to support the rural obstetric workforce and pregnant/postpartum people in those areas.

Study 2: Recently Closed Obstetric Units in Rural Hospitals

Understanding the experiences of rural obstetric units that have closed is crucial for several reasons. First, it can reveal early warning signs that could help identify other units at risk of closure. Second, it provides insights into the impact of closures on local communities, healthcare workers, and patient care pathways. Third, and perhaps most importantly, documenting the factors that contributed to these closures—from workforce challenges to financial pressures—can inform preventive strategies to help sustain obstetric services at other rural hospitals facing similar challenges.

Study 2 Objective: Identify critical factors and lessons learned from the recent closure of obstetric units at hospitals in Maine that could inform efforts to prevent closures at other hospitals in the state in the future.

Methods

In both studies, we conducted semi-structured, key informant interviews (KIIs) with key personnel, including hospital administrators, providers, and nurses, as well as individuals in state government positions. Many interviewees had roles that encompassed both clinical and administrative/leadership responsibilities. Recruitment of interviewees was supported by the RMOMS leadership, who provided our study team with contact information for key point people at the referral hospitals and rural hospitals with recently closed obstetric units (Table 1). The indicated point people were contacted via email to introduce the study, describe participant rights, and provide a list of potential interview questions (i.e., the semi-structured interview guide). In some cases, the designated point people referred us to other staff who they felt could provide valuable information and perspectives. Interviewees who agreed to participate in both studies were scheduled for a 30-60-minute Zoom interview. With consent from the participants, all interviews were audio-recorded and transcribed, and identifiers were removed to protect anonymity. The research team reviewed transcripts to ensure accuracy. More details about the methods, sample, and topics addressed during the interviews during each study are described further below.

Table 1. Locations and characteristics of hospitals participating in Study 1 (referral hospitals) and Study 2 (closed obstetrics units).

Referral hospital	City/town	County	Level of newborn care	Level of maternal care	2023 deliveries
MaineHealth Maine Medical Center	Portland	Cumberland	4	4	3,177
Northern Light Eastern Maine Medical Center	Bangor	Penobscot	3	3	1,582
MaineGeneral Medical Center	Augusta	Kennebec	2	2	1,045
Central Maine Medical Center	Lewiston	Androscoggin	2	2	850
Northern Light Mercy Hospital	Portland	Cumberland	2	2	666
MaineHealth Maine Medical Center Biddeford	Biddeford	York	1	2	433
Hospital with closed obstetrics unit	**City/town**	**County**	**Year of closure**	**Deliveries year prior to close**	
Bridgton Hospital	Bridgton	Cumberland	2021	55	
Rumford Hospital	Rumford	Oxford	2023	55	
Northern Maine Medical Center	Fort Kent	Aroostook	2023	46	

Study 1: Referral Hospital Perspectives

For this study, the RMOMS leadership team identified six hospitals in Maine that serve as referral hospitals for the care of pregnant/postpartum patients and neonates from rural areas and hospitals in the state (Table 1).

A total of 15 key informant interviews were conducted, including with hospital administrators, providers, nurses, and state-level stakeholders. As previously mentioned, some of these individuals functioned in more than one of these roles.

Interview guide topics included:

- General query about status of obstetric services at their hospital
- Workforce assets and needs, facilitators and barriers to sustainability, training needs, educational/training gaps, and opportunities to enhance safety and quality across the state
- Perceptions of patient and health workforce needs with rural obstetric units
- Feedback on top three recommendations from previous study (Box 1), and any other feedback

Study 2: Recently Closed Obstetric Units in Rural Hospitals

This study focused on the three rural hospitals that closed their obstetric units between 2021-2023 (Table 1). While York Hospital also closed during this time, given its geographic location, the decision was made in consultation with the RMOMS leadership team not to include it as part of the sample for this study.

A total of eight key informant interviews were carried out during the study period. These included hospital administrators, providers, and nurses from the three rural hospitals engaged in the study, as well as state-level actors. All interviewees except the state-level stakeholders were employed at the hospital at the time of the birth unit closure, and as mentioned, some functioned in more than one role. Additionally, at the time of the interview, some interviewees continued to work in the same hospital, whereas others had moved to other healthcare institutions or different settings and roles altogether.

Interview guide topics included:

- Critical factors in decision to close unit and efforts to circumvent
- Communicating decision and plans for continuity and emergency care
- Lessons learned from closure and recommendations to others facing decision
- Feedback on top three recommendations from previous study (Box 1), and any other feedback

Box 1. Top three recommendations from first RMOMS workforce assessment (Keefe-Oates et al., 2024).

- Develop short (several days/weeks per trainee), hands-on clinical immersion training for nurses from rural hospitals in OB and/or neonatal care at your hospital (new nurses or as a refresher course)
- Expand telehealth services for rural birthing hospitals to connect with specialists
- Support for advanced skill training for providers and/or nurses to allow them to practice to the full extent of their scope of practice, education, and licensure (for example, cesarean section training for family practice physicians; epidural training for CRNAs, etc.)

Member-checking

To ensure our findings were consistent with the experiences of obstetric unit staff, we conducted several rounds of member-checking—presenting preliminary findings and opening these up for feedback, questions and suggestions. We presented interim and preliminary findings to the RMOMS leadership as well as the RMOMS network to ensure findings were consistent, and incorporated feedback as needed into this final report.

Findings

Study 1: Referral Hospital Perspectives

Consensus between previous findings and current findings

The study reaffirmed many of the challenges previously identified in Maine's obstetric care landscape, with widespread agreement across stakeholders.

Alignment of Values

Healthcare providers across Maine exhibit a strong dedication and passion for delivering high-quality perinatal care. This shared commitment reflects a deep-seated state-wide value, focused on improving maternal and neonatal outcomes.

Statewide Struggle with Health Workforce Shortages

Workforce shortages remain a pressing issue across the state, affecting both rural and referral hospitals. While some new hires have been reported, the overall system remains under considerable stress. Recruitment and retention of obstetricians, nurses, and specialists continue to pose challenges, exacerbating the strain on already overstretched healthcare systems. This aligns with our prior findings that Maine faces persistent difficulties in recruiting and retaining OB providers, nurses, and specialists, particularly in rural areas.

Social Drivers of Health

Social drivers of health are critical factors influencing birthing experiences as well as the provision of perinatal care throughout Maine. Commonly cited issues included mental health struggles, substance use, poverty, and housing instability, as well as overlapping factors. Housing for families, especially when mothers or newborns require extended hospital stays, is a notable concern.

Rural Units Grappling with Challenges of Decreasing Birthrates

Rural obstetric units face unique challenges due to quickly declining birth rates. Low patient volumes hinder providers' ability to maintain clinical skills and confidence, further complicating recruitment and retention efforts. The shortage of specialists intensifies these difficulties, leaving rural units vulnerable in their efforts to provide comprehensive and high-quality obstetric care to their communities.

Referral hospitals feeling burden of providing large proportion of OB services and training for the state

Interviewees agreed that referral hospitals in Maine play a critical role in providing perinatal care, serving as hubs for both low-risk and high-risk pregnancies across the state. However, these facilities face significant pressure to support a system already under stress.

Providing OB Services to Both Low-Risk and Complex Patients

Referral hospitals in Maine face significant burdens as they provide care to both low-risk and complex patients. Interviewees from the two highest-level care centers, particularly those housing the highest levels NICUs, noted the strain of managing the most severe and low-risk cases statewide. This included

attending to people who had to travel from rural areas to see specialists, as well as people living in rural areas with low-risk pregnancies who still chose to seek care at the higher-level care facilities. This dual responsibility, for both low- and high-risk rural and non-rural patients strains their resources and workforce, particularly as demand continues to grow.

Imbalance Between Services Available and Services Utilized

Furthermore, a notable imbalance exists in how patients seek out perinatal services. High-risk patients sometimes seek care at rural units that may lack the necessary expertise or resources, while low-risk patients often choose referral hospitals, further stretching the referral hospitals' capacity. This mismatch complicates efficient resource allocation and places additional stress on referral hospitals already struggling with workforce limitations.

- *We do have patients who drive from a more rural area, even though we're not the closest hospital, because they specifically want to deliver [here] because of concerns about having a NICU available.*
- *It comes up maybe twice a month, maybe sometimes more, [we] have somebody who has done the entirety of their OB care at a more rural hospital and then just decides they don't want to deliver there and calls and asks if they can transfer care to us at like 38 weeks, which unless there's a medical indication, we typically don't encourage that because we don't know them, they don't know us.*

State-Wide Lack of Providers of Perinatal Services

Maine suffers from a critical shortage of perinatal care providers, including maternal-fetal medicine specialists, neonatologists, surgically trained personnel for pregnancy complications, mental health providers, and social workers. Referral hospitals also shoulder the responsibility of training the state's existing workforce and learners, adding to their operational challenges. Addressing these shortages is essential to relieving the burden on referral hospitals and improving statewide access to OB care.

Perspectives on challenges of providing perinatal care to people in rural Maine

Referral hospital interviewees consistently noted three key areas where challenges arose regarding the provision of perinatal care to people throughout rural Maine.

Workforce

Workforce challenges were noted as a critical barrier to rural perinatal care. Referral hospitals, already operating at capacity, struggle to provide sufficient training opportunities for providers and nurses who work in rural areas which further exacerbates recruitment and retention challenges for rural hospitals, as lack of exposure to enough births to maintain clinical skills discourages providers and nurses from accepting or staying in birth unit positions. The limited number of residency programs in obstetrics and family practice with an obstetric focus, coupled with the absence of any midwifery education programs in Maine, further constricts the pipeline of new healthcare professionals. Recruiting obstetricians and residents to the state remains a persistent challenge, leaving many rural communities with an inadequate health workforce to deliver perinatal care.

Coordination of Patient Care

Effective coordination of care for rural patients is impacted by logistical and systemic challenges. Transportation barriers make it difficult for patients to access referral hospitals, particularly for time-sensitive cases. Additionally, the lack of robust case and care management for complex pregnancies places further strain on rural providers and limits the ability to deliver seamless, patient-centered care across the state.

- *When you don't have other practices that use the same system, no matter where they're coming from, it's hard to get all the information you need and patients do not remember it...Or if they're coming from Colorado? There are many departments out there, or locations. And you call one. No, you don't have the right place. So there's a lot of time...It's hard to get the information to safely help any patient if you can't get the information you need.*

State-Level

Providing perinatal care in rural Maine is also hindered by systemic challenges at the state level. A lack of authority to regulate coordination of care across hospitals and health systems was identified. This contributes to fragmentation in service delivery and challenges with patient care and access across rural and referral hospitals.

- *I think we need to think about a system of care for perinatal patients in the state of Maine and that's really... a different problem to tackle.*

Feedback on recommendations from previous report

Interviewees were enthusiastic and supportive of the recommendations proposed in previous report. Specific feedback from interviewees about the top three priority recommendations from the report (Immersion skills training, expanding telehealth, and support for practicing to the full extent of licensure and training), are summarized below.

Immersion Skills Training

Feedback on immersion skills training, where providers from rural hospitals spend time training in referral hospitals even after their initial orientation and training, highlighted mixed reactions. Many participants valued the idea of training at referral hospitals to enhance clinician skills. However, concerns were raised about the potential to overwhelm the already strained capacity of these facilities, particularly the two higher-level care centers, Maine Medical Center and Eastern Maine Medical Center. Additionally, some feared that such centralized training might disrupt established patient-provider relationships. Overall, there was strong support for more on-site training programs and team-building support facilitated by perinatal care coordinators, which were seen as more practical and less disruptive.

- *We have a lot of learners: OB residents, family medicine residents, ER residents and then there's nursing students... So it's tough to find the balance between all of the people who would like to do something like that but also keeping the unit safe and not having double the number of people involved in every situation.*

Telehealth

Telehealth was widely recognized as a valuable tool for obstetric services, particularly for neonatal and pediatric telehealth support. This technology helps bridge gaps in expertise and accessibility for rural providers. However, its limitations were acknowledged, particularly for labor and delivery emergencies, where in-the-moment, hands-on care is essential. Despite these constraints, telehealth remains a promising solution for many aspects of prenatal, postpartum, and NICU care.

Support for Practice to Full Extent of Licensure/Education

The vast majority of interviewees supported enabling healthcare team members to practice to the full extent of their licensure and education. This approach was seen as a practical and efficient way to address workforce shortages, allowing nurse practitioners, midwives, CRNAs and other professionals to take on expanded roles and alleviate pressures on Maine's obstetric care system. Additionally, malpractice insurance policies regarding trial of labor after cesarean (TOLAC) were identified as restrictive for rural providers who might otherwise be able to offer this option for patients.

- *Anytime someone is able to practice and learn a skill and able to utilize the highest tier of their licensure is wonderful, and it broadens the skill mix so you're not having to be reliant on just one sort of professional and wait for an anesthesiologist.*

Study 1 Key Findings Summary

The findings highlight the immense pressures facing Maine's obstetric care system, with both rural and referral hospitals grappling with workforce shortages, systemic inefficiencies, and the pervasive influence of social determinants of health. Despite these challenges, the shared dedication of providers to improving OB care is a testament to the resilience of the healthcare workforce. Addressing these issues will require targeted interventions, including on-site training, expanded telehealth services, and enhanced training and care coordination between hospitals. By implementing these strategies, Maine can move closer to building a sustainable and effective obstetric care system that meets the need of all its residents.

Study 2: Recently Closed Obstetric Units in Rural Hospitals

Declining birth volume and staffing challenges led to decision to close

Interviewees across the three hospitals reported the critical factors that led to the decision to close the birth unit were a combination of declining birth volume and staffing challenges. Common themes voiced included persistent and/or increasing difficulty with recruitment and retention of skilled providers. This included clinical personnel of all types, with specific mention of physicians (OB-GYNs, Family Practice, Pediatricians, Anesthesiologists), Certified Registered Nurse Anesthetists (CRNAs), and nurses. This made keeping the birth unit open difficult. One interviewee shared that before the decision to close was made, the hospital was forced to divert pregnant patients to other facilities "more often than not" because of the lack of available, skilled providers and/or nurses.

Specific factors mentioned as contributing to retention and recruitment challenges included the hospital's aging OB/perinatal workforce, demanding call schedule for providers and nurses, and inability to take time off for illness or vacation. Additionally, low birth volume was noted as leading to open positions seeming undesirable to potential recruits who were passionate about obstetric/perinatal care and "drift" of OB nurses to hospitals with higher birth volumes.

Additionally, both clinical staff and administrators voiced growing concerns about safety and loss of confidence in perinatal-relevant skills among providers and nurses due to the low birth volume as contributors to the decision to close. Notably, none of the interviewees identified a single event (e.g., a catastrophic birth or poor birth outcome), a specific number of births, or financial issues that precipitated the decision to close. Additionally, themes that emerged during these interviews were similar to those voiced by personnel from rural hospitals with open obstetric whom we engaged as part of the previous report (Keefe-Oates et al., 2024).

Finally, when asked if they had any ideas about how closure might have been prevented, interviewees had little to suggest.

Tension regarding the timing of announcement about decision to close

In response to questions about communicating the decision to close the birth unit both internally to birth unit personnel and within the hospital, as well as to external interest holders, several themes emerged.

Interviewees with administrative responsibilities voiced that the requirement of notifying the state 120 days in advance about the decision to close a birth unit was not always possible due to existing challenges with birth unit staffing. Furthermore, interviewees voiced that announcing the decision this many days before actual closure exacerbated challenges with retaining birth unit personnel (clinical and administrative) who may seek employment elsewhere when they find out.

At the same time, interviewees recognized that the transition from providing to no longer providing birth services requires sufficient time for planning, and that 120 days was not excessive in this regard. Specific aspects of transition planning raised by interviewees are highlighted in the following section.

Lessons learned/recommendations for others facing decision

In response to questions about any lessons learned from their experiences with closing their birth unit or recommendations for other hospitals facing this decision, interviewees shared a number of insights. One overarching theme that emerged was more time allows for better planning. Specifically, interviewees noted that more time allows for:

- Planning for continuity of care among patients who are currently pregnant and receiving prenatal care and planned to deliver at the hospital
- Communicating with future providers about current patients and arranging for transfer of patient information
- Navigating interoperability between different electronic health record systems, which was noted as a particular challenge
- Preparing hospital emergency services to provide care to pregnant/postpartum patients who present (regardless of the birth unit closure)
- Preparing and shoring up systems for transport of patients, including for prenatal/postpartum/labor/emergency situations
- More opportunities for dialogue with hospital personnel and the community about this sensitive issue and time for feelings to settle

> *Have tough conversations about closure sooner rather than later. Don't wait too long or hang on when the writing is on the wall.*

Lessons learned/recommendations for hospitals with closed units

Interviewees offered other important learnings and recommendations for other rural hospitals. After the decision to close is made, it is important to consult others for guidance, best practices, processes, and procedures including other recently closed units, state government/Department of Health and Human Services/Maternal Child Health Division, Maine Hospital Association (MHA). Interviewees noted that maintaining prenatal care is difficult to operationalize due to provider availability and scheduling. In addition, pregnant patients will still show up at the hospital even after the birth unit has closed, so it is important to be prepared. It was noted that patients who will still show up for care are often

those who are most vulnerable/marginalized, and who have the greatest needs. Specific suggestions for preparing emergency response teams (emergency department and EMS) included:

- Co-develop protocols (OB team and emergency response teams)
- Procure equipment (a Kangoofix transport system was reported as one specific piece of equipment that was purchased and felt to be beneficial)
- Provide ongoing training
- Establish a consultation system

Lastly, when queried about the possibility of reopening the birth unit, across all of the hospitals, interviewees expressed difficulty imagining that possibility.

Feedback on 3 top recommendations from previous report

In response to questions about the top three priority recommendations proposed in the previous RMOMS workforce assessment (Box 1), interviewees were generally positive. Specific feedback on each of these recommendations is summarized below.

Immersion at high-volume hospitals for nurses (and providers)

While not unanimous, most interviewees felt that this intervention would have benefited their obstetric workforce, especially as they faced declining birth volume.

Increase telehealth support for rural OB teams via specialist consultation

Overall, interviewees expressed that telehealth played an important role in supporting obstetric/birth care to rural patients. However, they felt it was generally more useful for prenatal consultations and neonatal care immediately after delivery, but that expanding its use to emergency situations during delivery was hard to imagine. Still, several interviewees noted its use could have been beneficial. One interviewee expressed concern about reimbursement for telehealth as a barrier to expansion.

Advanced skill training to full scope of licensure/training/education

Interviewees were generally supportive of this recommendation. As one interviewee stated, "The more skills they have the better." Though supportive of the idea of facilitating advanced skill training, they cautioned that they would "still would need enough volume to keep skills up."

Study 2 Key Findings Summary

The study findings highlight the difficult decisions rural hospitals with obstetric units in Maine face as they struggle to maintain an adequate health workforce that is capable and confident in providing safe obstetric care in the face of declining birth volume. A key takeaway from those that have made the decision to close is to try to have sufficient time between when the decision is made and the end of services to allow for communicating the decision to both internal and external interest holders, plan for the transition in care of currently pregnant patients, and to prepare emergency services in the hospital and community to provide care to those who "will show up." Guidance from other hospitals that have recently closed their obstetric units, the state's Maternal Child Health and Office of Rural Health and Primary Care, and the Maine Hospital Association was also advised for rural hospitals that make the decision to close in the future.

Recommendations

We compiled two sets of recommendations: 1) Recommendations to support the current rural obstetric workforce (drawn from both these studies and our previous report), and 2) Recommendations for closing or closed obstetric units. These recommendations were developed using data from current interviewees' responses and evaluation of recommendations from the previous report, suggestions directly from interviewees during this study, and recommendations the team compiled after hearing about experiences and suggestions from interviewees. Overall, we heard support and enthusiasm for additional training opportunities for obstetric unit staff, and an emphasis on the importance of collaboration and communication to streamline and optimize care for patients.

Recommendations to support current rural obstetric workforce

★ Continuing recommendations from the previous report are denoted with stars

Recommendations for increased statewide coordination

Coordination between rural and referral hospitals is crucial to ensure patients can receive services promptly and rural hospitals can receive support in maintaining skills and accessing experts from the referral hospitals. A need for a greater level of statewide coordination is apparent. Some specific recommendations that emerged from the interviews focused on programs that are currently in process; some interviewees mentioned the programs by name, while others suggested similar programs. Based on these findings, we highlight here collaborations that are ongoing, as well as new spaces for collaboration based on interviewee recommendations.

Continue statewide collaborations to improve care:

- ★ Increase availability of perinatal mental health support services: Interviewees highlighted the ongoing need for providers and programs to support maternal mental health. RMOMs is currently working to implement a telehealth perinatal mental health support service intended to support rural patients.
- ★ Explore financial reform options: There was an acknowledgment that increased reimbursements and payment systems may help sustain smaller rural units. Efforts are underway to assess potential changes to financial support for rural hospitals.
- ★ Continue support for physician and other clinician training and recruitment programs: Ensuring enough physicians and other clinicians are available to serve all obstetric units is critical to supporting hospitals in staying open. Support for the state's and hospital association's efforts to recruit physicians to Maine was widely expressed.
- ★ Continue support for provision of perinatal specialist/expert support to rural hospitals and patients through consultation (on-site, virtual): The perinatal specialists who, through state funding, support all units in the state, were recognized as an important resource to all obstetric units in providing trainings and support where needed.
- ★ Continue support for statewide Perinatal Quality Collaborative: Identification and coordination of needed perinatal services is critical to supporting the obstetric workforce. Additionally, subject matter experts have recommended adding rural interest holders to these groups to ensure that

data on rural patients, hospitals, and the workforce are being examined and that needs are being identified and addressed in a manner that includes those who are most familiar with them.

Coordination needed between referral hospitals and rural hospitals:

- Establish/increase support for care coordinator/community health worker role at referral hospitals with specialized knowledge of available resources for patients from rural communities: Given that many people with higher-risk pregnancies need to travel from their communities to referral hospitals for care, interviewees suggested having care coordinators at the referral hospitals who have in-depth knowledge of resources for patients in rural communities to help connect them to those resources when necessary.
- ★ Establish immersion skills training programs for clinical staff from rural hospitals at higher volume/referral hospitals: Immersion skills trainings for staff from rural hospitals in referral units were recognized as a great opportunity to receive rapid training and to practice and maintain skills.
- ★ Support/expand telehealth services: The current telehealth capacities, including telehealth services between specialists and staff in rural hospitals, and services for patients, were recognized as

important, as was the opportunity to increase other telehealth services. Equally important is the provision of updated equipment and infrastructure to conduct those telehealth visits.

- Identify champions from referral hospitals to participate in rural work-groups to help increase coordination and communication: Providers from referral hospitals had suggestions on how to improve coordination between rural and referral hospitals. Involving them in rural work groups such as RMOMS could aid in sharing ideas and coordinating.

Recommendations for expanding and supporting care options throughout rural hospitals

The challenges with low birth volume and receiving enough training and practice to provide optimal care were heard across all studies. Interviewees identified challenges in ensuring training for staff that merit additional exploration and creative solutions:

- Support rural hospitals in continuing and expanding simulations: Simulations were widely recognized as important and valuable training tools for staff at rural hospitals.
- Explore the lack of a trial of labor after cesarean (TOLAC) option as compared to neighboring states and seek possible solutions: Many participants mentioned the lack of TOLAC offered in hospitals as one barrier to patients choosing to give birth in rural hospitals. Understanding how to support TOLAC as an option in rural hospitals may help increase the number of patients choosing to deliver in these sites.
- Gain a greater understanding of patient preferences for care (local v. referral hospital) and develop initiative(s) to address: Similarly, reasons behind patient decision-making around whether to give birth in a rural hospital or to travel further to a referral hospital are not yet entirely understood. Further understanding of people's decision-making may help determine how to support rural hospitals in providing care to patients who may currently prefer referral hospitals.
- Support coordinated system of transportation and transfer for pregnant/postpartum patients: Interviewees reported disparate challenges in ensuring pregnant and postpartum patients could travel to their appointments and be transferred promptly when needed, together with their newborns, if the need arose. Further exploration could focus on how to coordinate these systems for optimal care, including coordinating transportation and the transfer of medical records, thus reducing the burden on staff of navigating the transfer and providing more prompt, high-quality care.
- ★ Support expanded care options at local hospitals, including increased provider types and services: By supporting CNMs and family practice providers in providing care at local hospitals, as well as facilitating TOLAC, units can ensure they are well-staffed and prepared to offer care to all those seeking it in their communities.

Recommendations for Hospitals with Closing or Closed Obstetric Units

Interviewees provided valuable suggestions on how to support the workforce of hospitals whose birthing units were closing, had closed, or had no birth services. We synthesize those recommendations here into recommendations for units as they are closing and recommendations for hospitals in areas with no birth services.

Recommendations to support closing units

When a unit is closing, prompt and clear communication and preparation can help ensure that the workforce and the community are able to provide good care, transfer patients, and prepare for the closure. Of particular importance are the following:

- Establish a formal process to connect closing with recently closed units, state government, and the Maine Health Association. These entities can provide consultation and technical assistance in the best practices for closing processes and how to communicate the decision to unit personnel, hospital staff, and the public.
- Support efforts to ensure patient continuity of care and adherence to the state 120-day notice policy. This notice is crucial to ensuring patient continuity of care and to ensure hospital staff are prepared and trained to respond after a unit has closed.

Recommendations for areas with no birth services, including where obstetric units have closed

In regions where no obstetric unit exists, it is crucial to ensure that any pregnant person who presents to the hospital can receive adequate care. Of particular importance are the following:

- Ensure all medical staff who may attend to a pregnant or postpartum person have adequate training. This includes providing ongoing OB trainings, such as simulations, as well as telehealth consultation services and adequate equipment, to emergency department personnel, emergency medical services and other first responders, and any other health services and providers where pregnant and postpartum patients may present for care.
- Formalize regional partnerships between hospitals without OB services and larger/referral hospitals with services. Having formalized partnerships will ensure that patients can be promptly and efficiently transferred to larger hospitals, if need be, and that providers at rural hospitals can be supported through consultations if needed, ensuring high-quality care for the patients.
- Support access to health and social services that enhance the overall health of children, pregnant/postpartum people in communities with no service.

Discussion

The two studies presented in this report, carried out between June and December 2024, are companions to the Needs Assessment of the Obstetrics Workforce in Maine's Rural Hospitals we conducted in Fall 2023. Together these three studies offer a triangulated, in-depth view into the day-to-day challenges of providing safe and acceptable care to pregnant people and newborns in rural Maine. Maine is not alone in this situation. Across the United States, rural hospital closures and the closure of obstetric units in rural hospitals are growing trends that have been found to negatively impact rural populations. In Maine, the demographic trends of an aging population and health workforce, and declining birth rates in rural parts of the state have led to a "perfect storm" that has resulted in the closure of six obstetric units in the past 10 years. While every state and rural community is unique, across the country there is a clear tension between keeping birth services geographically accessible and maintaining the safety and quality of obstetric services in hospitals with low birth volumes.

The implications for maternal and child health of birth unit closures and of declining birth volumes at rural hospitals are not straightforward. Researchers at the University of Minnesota Rural Health Research Center recently summarized the available data on this topic in a Practical Implications report (Kozhimannil et al., 2024). A key finding of their review was that there are known maternal and infant health risks associated with all three of the following situations: i) loss of hospital-based obstetric care; ii) increased travel distance to obstetric care, and iii) childbirth in lower-volume rural hospital obstetric units. Specifically, birth unit closures were found to be most impactful for non-urban adjacent counties with immediate and persistent increases in out-of-hospital births (small), emergency department births (very large), and increases in pre-term births (modest). Urban-adjacent counties were also found to have measurable maternal health effects with increases in out-of-hospital and emergency department births; however, emergency department births did not persist.

At the same time, research has found an association between maternal health and birth volume, with elevated risks of severe maternal morbidity in hospitals with lower birth volumes. However, other research shows significant variability in patient safety outcomes across rural hospitals with different birth volumes. Based on the existing research, Kozhimannil and colleagues at the UMN Rural Health Research Center assert that "better performance is not consistently associated with either lower- or higher-volume facilities for outcomes such as rates of low-risk cesareans, non-medically indicated cesareans, episiotomies, and perineal lacerations" (Kozhimannil et al., 2024, p.4). They also note that risk can be mitigated "when known and addressed" (Kozhimannil et al., 2024, p.3). This point aligns with our recommendations on investing in health workforce skill acquisition and maintenance and team-based trainings, as well as our finding of allowing as much time as possible for planning when the decision to close a unit has been made.

In sum, both birth unit closures and low birth volume have implications for maternal and infant health, about which the UMN researchers conclude, "There is currently no clinical or policy consensus on the number of births and associated financial, staff and training resources needed to safely provide obstetric services, nor is there clarity on volume thresholds for safety under different clinical circumstances" (Kozhimannil et al., 2024, p.4).

Beyond implications for health, the closure of obstetric units and lack of accessible rural maternity services have other broad impacts on rural communities and hospitals, including both economic and social (i.e., hospital workforce morale, community sense of loss, etc.) (Kozhimannil et al., 2024). These are also important factors to consider when making a holistic assessment to inform decisions about supporting and allocating resources for maternity care in Maine, as well as other states. It is our hope that the three studies we have carried out over the past 18 months will help to inform such decisions in Maine.

References

- American Hospital Association. “Obstetrics | US Rural Hospitals,” 2022. https://www.aha.org/system/files/media/file/2022/04/Infographic-rural-health-obstetrics-15ap22.pdf.
- Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Natality on CDC WONDER Online Database. Data are from the Natality Records 1995-2023, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program.
- Government Accountability Office. “Report to Congressional Committees: Maternal Health, Availability of Hospital-Based Obstetric Care in Rural Areas.” United States Government Accountability Office, October 2022. https://www.gao.gov/assets/gao-23-105515.pdf.
- Keefe-Oates B, Simmonds K, Smith L, Stolow J. Needs Assessment of the Obstetric Workforce in Maine’s Rural Hospitals. The Maine Rural Maternity and Obstetrics Strategies Network. Portland, ME. January 2024. https://roux.northeastern.edu/story/needs-assessment-of-the-obstetric-workforce-in-maines-rural-hospitals/.
- Kozhimannil KB, Interrante JD, Fritz AH, Sheffield EC, Carroll C, and Handley SC. Information for Rural Stakeholders About Access to Maternity and Obstetric Care: A Community-Relevant Synthesis of Research. UMN Rural Health Research Center Policy Brief. September 2024. https://rhrc.umn.edu/publication/information-for-rural-stake-holders-about-access-to-maternity-and-obstetric-care-a-community-relevant-synthesis-of-research.
- Census Bureau. “‘AGE AND SEX.’ American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0101,” 2020. https://data.census.gov/table/ACSST5Y2020.S0101.
- US Census Bureau. “‘URBAN AND RURAL.’ Decennial Census, DEC Demographic and Housing Characteristics, Table P2,” 2020. https://data.census.gov/table/DECENNIALDHC2020.P2.

Appendix

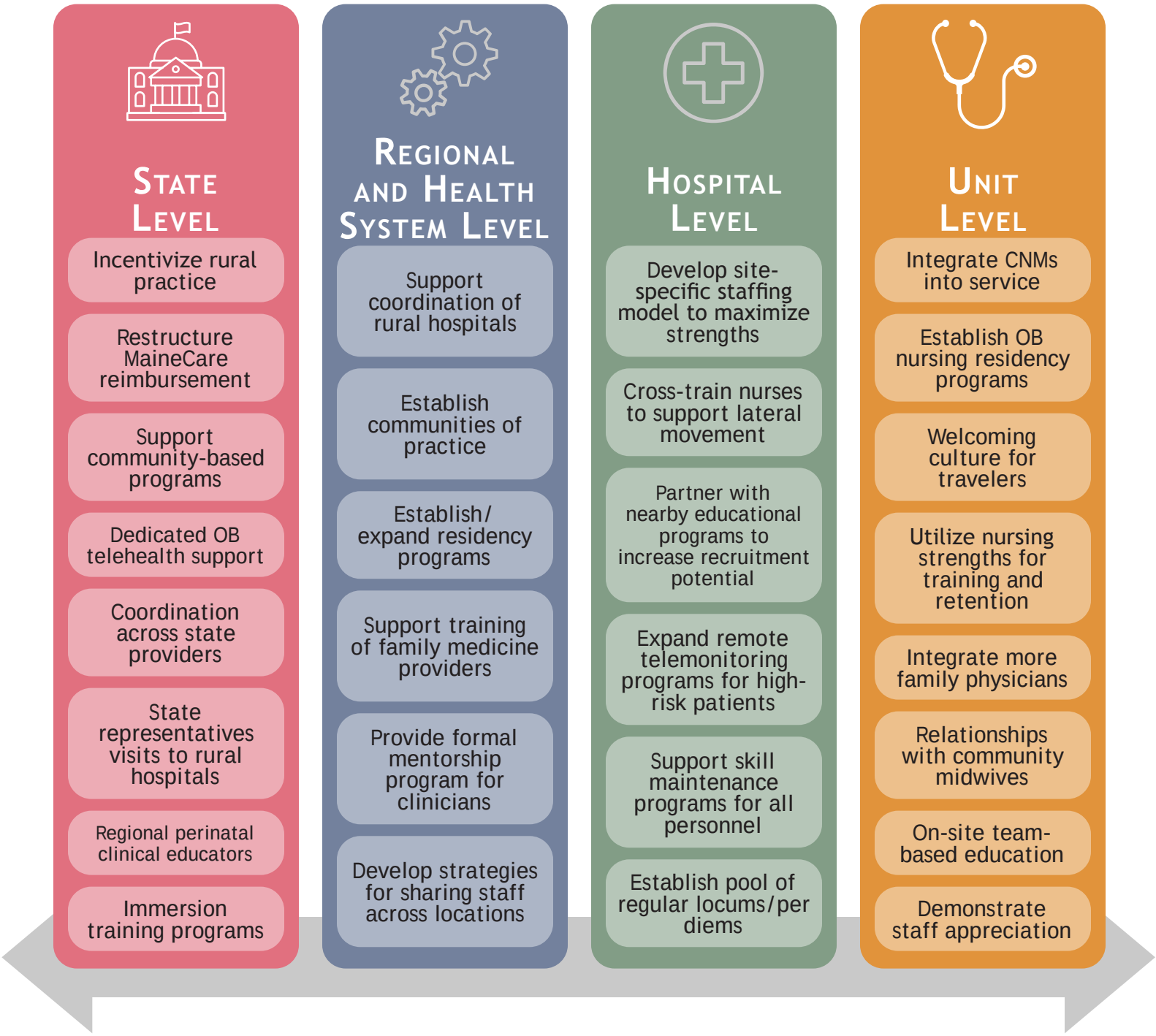

Figure A1. Recommendations for multi-level solutions from the first RMOMS rural obsettric workforce assement report (Keefe-Oates et al., 2024).

This assessment was contracted by MaineHealth to the Roux Institute at Northeastern University. It was supported by Rural Maternity and Obstetrics Management Strategies (RMOMS) grant number UK9RH46984, through the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS). The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement by, HRSA, HHS, or the U.S. Government. For more information, please visit HRSA.gov.