Evaluation of the Rural Maternity and Obstetrics Management Strategies (RMOMS) Program: 2019 Cohort

Second Annual Report

May 2022

HRSA
Health Resources & Services Administration

Contents

NOTES

The Evaluation of the Rural Maternity and Obstetrics Management Strategies (RMOMS) Program: Second Annual Report was produced for the U.S. Department of Health and Human Services (HHS), Health Resources and Services Administration (HRSA), Federal Office of Rural Health Policy (FORHP) under contract number 5R60219D00016 to Mission Analytics Group, Inc.

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Suggested citation: U.S. Department of Health and Human Services, Health Resources and Services Administration, Federal Office of Rural Health Policy, *Evaluation of the Rural Maternity and Obstetrics Management Strategies (RMOMS) Program: Second Annual Report*. Rockville, Maryland: U.S. Department of Health and Human Services, 2022.

Note on Language: This report uses the terms “women” and “mothers” to align with language used by the RMOMS awardees and in cited secondary data sources. Where possible, we use “RMOMS participants” or “pregnant individuals.” We remain committed to using respectful language and evaluating the quality of pregnancy-related care for all clients served by the RMOMS program, including individuals who do not identify as female.

FOREWORD

The Health Resources and Services Administration (HRSA), the primary federal agency for improving health care for people who are geographically isolated or economically or medically vulnerable, is proud to present this Second Evaluation Report of the 2019 Cohort of the Rural Maternity and Obstetrics Management Strategies (RMOMS) program. This joint effort between HRSA's Federal Office of Rural Health Policy (FORHP) and Maternal and Child Health Bureau (MCHB) is the agency's first-ever venture into an ambitious effort to address the broad public health challenge of improving maternal outcomes in rural areas.

In 2017, researchers found that over half of rural counties lacked hospital-based obstetric services, drawing attention to a long-standing problem around access to obstetric services in rural areas.[1] Turning research into practice, FORHP decided to test whether a coordinated approach to maternity care could improve access and outcomes in rural areas in a sustainable manner while also reducing costs. The idea was to encourage all partners that come into contact with pregnant people – Rural Health Clinics, Federally Qualified Health Centers, hospitals, Critical Access Hospitals, public health departments, behavioral health specialists, etc. – to work together with the common goal of improving access to care and health outcomes.

Novel programs such as RMOMS are rarely tested in rural areas for a variety of reasons, including provider shortages, low patient volume, and transportation challenges. A robust evaluation is critical for determining the viability of this type of program in smaller, under-resourced rural areas. While the First Annual Report provided background and context for each of the awardee service areas and target populations, this Second Annual Report for the RMOMS 2019 Cohort focuses on the first year of implementation (September 2020–August 2021) when the awardees put their models into action. This report provides an initial data snapshot of the people supported by the program and the services they received, examines how the network partners worked together, and provides early lessons learned.

The need to improve maternal health in rural areas prompted funding for additional RMOMS cohorts. FORHP made three awards in 2021, and Congress has appropriated new funds to expand RMOMS from a pilot to a formal ongoing program. Each cohort will have the opportunity to test novel approaches to collect data on rural hospital obstetric services; build networks to coordinate care across pregnancy, delivery, and postpartum; leverage telehealth and specialty care; and improve financial sustainability. Cohorts will be evaluated to determine best practices, and the findings will add to the evidence base of rural maternity care. Insights and lessons learned from previous cohorts can help inform future RMOMS networks, and successful RMOMS programs can serve as a model for other rural health networks.

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EXECUTIVE SUMMARY

In August 2021, the first cohort of the Rural Maternity and Obstetrics Management Strategies (RMOMS) program completed its first year of implementation, funded by the Health Resources and Services Administration (HRSA) through the Federal Office of Rural Health Policy (FORHP) and the Maternal and Child Health Bureau (MCHB). Launched in 2019, the RMOMS program uses network models to increase access to maternal and obstetrics care in rural communities and to improve health outcomes for mothers and infants. The RMOMS program has four required Focus Areas: a network approach to coordinate and improve maternal health care from preconception to postpartum; telehealth services to increase access to care in rural areas; potential aggregation of low-volume rural obstetric services; and payment structures that promote financial sustainability for access to high-quality maternal care.

Three rural networks were funded as the RMOMS program 2019 Cohort: the Missouri Bootheel Perinatal Network (BPN), the New Mexico Rural Obstetrics Access and Maternal Services (ROAMS) Network, and the Texas-RMOMS Comprehensive Maternal Care Network (TX-RMOMS). The first year of funding (September 2019 to August 2020) supported planning ahead of the September 2020 launch of implementation. The work of the planning year was captured in the Evaluation of the Rural Maternity and Obstetrics Management Program: First Annual Report.

This Second Annual Report documents findings from the 2019 Cohort's first implementation year, September 1, 2020 to August 31, 2021. Under contract with FORHP, Mission Analytics Group, Inc. is conducting an independent evaluation of the program, using a mixed-methods approach to document the awardees' models, monitor key access and outcome measures over time, and identify lessons for future maternal health networks, including subsequent RMOMS cohorts. The evaluation draws on qualitative data, including awardee interviews and documentation, and quantitative patient-level data submitted by awardees.

Key findings from the Second Annual Report include:

- The three awardees in the 2019 Cohort of the RMOMS program provided prenatal, labor and delivery, and/or postpartum care to 3,101 rural RMOMS participants, with nearly 2,000 deliveries.
- The RMOMS awardees brought a wide range of partners into rural maternal health networks using different models. The least centralized model (ROAMS in New Mexico) had the greatest early success, while the Missouri awardee (BPN) experienced the greatest partner turnover, in part due to competition within the original network.
- Patient navigators emerged as an early success area for all three awardees, demonstrating the value of drawing on dedicated staff to enroll RMOMS participants in Medicaid, manage referrals to support services, and facilitate clinical care across the network.
- Awardees laid the groundwork for expanded telehealth, which they consistently identify as a major focus area to improve maternal health access, but all three experienced implementation delays that have pushed their efforts into the next implementation year.

- Patient-level data reporting was challenging for the RMOMS awardees. Manual entry worked for the awardee serving the smallest population, but the awardees serving larger populations faced barriers to data sharing, electronic health record (EHR) reporting, and tracking support services.

This Second Annual Report expands on these themes and documents awardees' progress, successes, and challenges during their first year of RMOMS program implementation.

A. The 2019 RMOMS Cohort Networks and Individuals Served

The three RMOMS service areas in the 2019 Cohort face significant maternal health barriers, including poverty, limited access to prenatal care, and worse infant and maternal health outcomes than average for their states. BPN serves six counties – Dunklin, Mississippi, New Madrid, Pemiscot, Scott, and Stoddard – in the southeast corner of Missouri, known as the Bootheel. The ROAMS network serves women in Taos, Colfax, Union, Mora, and Harding counties in northeastern New Mexico. The TX-RMOMS network serves six counties (Val Verde, Uvalde, Edwards, Real, Kinney, and Zavala counties) in two service areas: Val Verde and Uvalde.

Hospitals or hospital systems serve as the lead agencies for the RMOMS networks; for two of the three awardees, the lead hospitals are outside the RMOMS service area. TX-RMOMS is led by University Health, a large hospital system in metropolitan San Antonio. BPN is led by Saint Francis Healthcare System, which is a tertiary center with 300 beds located just north of the RMOMS service area. Only ROAMS is led by a hospital within its service area; Holy Cross Medical Center is a Critical Access Hospital (CAH) with 25 beds based in Taos, New Mexico.

Each network includes a set of formal partners, including other hospital systems, state Medicaid programs, Federally Qualified Health Centers (FQHCs), rural health clinics, and other clinical prenatal care providers. BPN's network also includes three behavioral health agencies, a support service agency, and health departments. ROAMS' network includes five support service agencies and the University of New Mexico. For both ROAMS and TX-RMOMS, the networks are split into two distinct service areas anchored by delivery hospitals.

In the first implementation year, 3,101 women received prenatal, labor and delivery, or postpartum clinical services funded or coordinated by RMOMS. Awardees reported 1,990 deliveries during the implementation year. More than half of the RMOMS maternal/clinical population received health coverage from Medicaid, including three-quarters of those served by ROAMS. Of the three, only New Mexico offered expanded Medicaid under the Affordable Care Act (ACA) during this implementation period.

Maternal/Clinical Populations Reported in the First Implementation Year

Characteristic	BPN	ROAMS	TX-RMOMS
Total maternal/clinical population	1,305	463	1,333
Total deliveries	929	281	780
Age in years			
Under 18	2%	2%	2%
18–25	42%	33%	44%
26–30	30%	27%	27%
31–34	15%	20%	14%
35 or older	11%	17%	12%
Health insurance status			
Medicaid	64%	75%	49%
Military insurance	<1%	--	7%
Private insurance	35%	24%	38%
No insurance/uninsured or other	<1%	<2%	7%

Notes: Health insurance status is for the population with reported health insurance. Individuals with unknown health insurance status are excluded from this table. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

B. RMOMS Network Strategies

With the establishment of formal arrangements among network providers, the strategies implemented this year focused primarily on patient navigation/care coordination, the launch of telehealth initiatives, and expanded access to prenatal care. Two of the RMOMS awardees also engaged with Medicaid programs on potential policy changes to make the network approaches sustainable beyond the RMOMS funding period.

Network Activities

Activity	BPN	ROAMS	TX-RMOMS
Employment of patient navigator or care coordinator	Implemented at one site; planned expansion	Implemented at multiple sites	Implemented at multiple sites
Referrals to social service providers	Implemented	Implemented	Implemented
Network-wide telehealth initiative	Planned	Implemented; additional planned	Planned
Expanded access to prenatal care	--	Added two prenatal clinics	Added a physician; hiring behavioral counselors
Pursuit of Medicaid policy changes	In progress	In progress	--

Patient Navigation and Referrals to Services: All three RMOMS networks implemented expanded patient navigation and referral services during the first implementation year with dedicated staff to serve as a single, familiar contact for patients, with referrals to support services implemented in all three networks. In each case, the navigation services have primarily addressed needs during the prenatal period, although barriers to breastfeeding were a common area for education, and ROAMS also hired a lactation consultant. Awardee approaches to navigation differ in formality and goals. For example, ROAMS family navigators guide patients through the standardized Pathways patient navigation program, BPN connects RMOMS participants to essential support services, and TX-RMOMS invests significant time in increasing Medicaid enrollments.

> "I've had a mom who just broke down in tears and cried…from the breastfeeding support, the breast pump support, and just having someone there…she has done the pregnancy all by herself and she's one of the moms who called me every single week and our visits last a whole hour, every single time." – ROAMS Family Navigator

Telehealth: Telehealth was proposed as a central focus of the RMOMS awards, and all three networks made progress on telehealth initiatives during the first implementation year. These include telehealth prenatal appointments, remote visits with patient navigators, telehealth maternal–fetal medicine (MFM) consults or ultrasound reads, and home telehealth kits. Despite progress, none of the three networks met their goals for telehealth in the first year due to a range of challenges. In addition to the pandemic, network providers experienced start-up challenges related to capital costs, supply chain problems, shortages in local technicians, connectivity issues, and some unwillingness on the part of clinicians due to payment barriers or fears of losing patients to non-local providers.

Expanded Access to Prenatal Care and Clinicians: Expanding access to in-person prenatal care emerged as a top strategy for both ROAMS and TX-RMOMS, both of which have less access to local services than BPN. ROAMS opened two new prenatal clinics in underserved locations in the service area, one relying on telehealth and the other relying on a clinician traveling from another network site. TX-RMOMS added a new physician at one of its rural health clinics and plans to hire behavioral health counselors. Both networks aim to reduce long drive times (up to five hours one way for some patients) to access routine prenatal care.

Medicaid Policy Changes/Sustainability: All three awardees consider long-term sustainability in their strategic planning (a required Focus Area for awardees). BPN and ROAMS are working to secure long-term Medicaid reimbursement for their patient navigator positions, and ROAMS has also identified statewide changes to Medicaid reimbursement policy that could provide higher financial support for provision of delivery care, lactation consultation, and Medicaid-financed transportation throughout New Mexico. TX-RMOMS had less of a focus on sustainability during the first implementation year compared to ROAMS and BPN. For the second implementation year, TX-RMOMS plans to prioritize recruiting and retaining permanent staff positions and exploring whether the state Medicaid program can offer adequate reimbursement for the network's telehealth initiatives after RMOMS funding ends.

C. Maternal and Infant Outcomes

The evaluation will assess changes in maternal and infant outcome measures across the implementation period. These measures draw on patient-level data submitted by each awardee for its maternal/clinical population. Awardees submitted patient-level data in the planning year, but the populations covered in those data are not comparable with the population served in the implementation period. Therefore, the data presented here, which reflect deliveries at any time in the first implementation year, will provide the basis for comparisons in future years. Because of differences in populations served, relatively small sample sizes, and data submission challenges, the differences between awardees should not be considered differences in performance under the RMOMS programs.

Among individuals who delivered in the first implementation year, more than 70 percent of those served in the BPN and ROAMS networks received prenatal care in the first trimester. The Healthy People 2030 index for "early and adequate prenatal care attendance" sets a target of approximately 80 percent for this measure.[2] First trimester prenatal care was only reported for 45 percent of those served in TX-RMOMS, but the network only observed prenatal care from in-network providers. Among those observed at least 12 weeks after delivery, most had a postpartum visit recorded in this window, ranging from 72 percent in TX-RMOMS to 82 percent in ROAMS.

Infant Health Outcomes and Prenatal/Postpartum Care Utilization Among the Delivery Populations in RMOMS Service Areas in the First Implementation Year

Metric	BPN	ROAMS	TX-RMOMS
Total who delivered	929	281	780
Prenatal and postpartum care utilization			
Received prenatal visit in first trimester	78%	72%	45%
Received postpartum visit within 12 weeks of delivery	--	82%	72%
Infant health outcomes			
Low birthweight (<2,500 g)	11%	10%	5%
Preterm birth (<37 weeks)	12%	12%	7%
Had any NICU stay	3%	6%	<2%

Notes: The Healthy People 2030 target for first trimester prenatal care is for "early and adequate prenatal care" using an index that calculates first trimester prenatal care attendance. Preterm birth is before 37 weeks of gestation. Low birthweight is less than 2,500 grams. Due to missing data, the evaluation could not reliably determine the number of RMOMS participants who delivered and reached at least 12 weeks postpartum in the reporting period to calculate postpartum measures for BPN. Source: patient-level data submitted by the awardees in June and December 2021 and U.S. Department of Health and Human Services, Healthy People 2030. The first implementation year was September 1, 2020 to August 31, 2021.

Although prenatal care was less likely to be reported for TX-RMOMS, a larger share of infants in the BPN and ROAMS networks had poor birth outcomes. About one in nine infants in the BPN and ROAMS networks were born preterm (before 37 weeks of gestation). The Healthy People 2030 target is fewer than one in 11.[2] Only TX-RMOMS met this threshold in the first implementation year. Similar shares of the infants were born with low birthweight, although neonatal intensive care unit (NICU) stays were rare.

Patient-level data reporting for the evaluation was a significant challenge for all three awardees. ROAMS was the only awardee able to report consistent data between its planning year and implementation year, and it was the only awardee to use its data for internal analyses. However, it achieved successful data submission through manual data entry, working with the smallest service population. Awardees found it difficult to pull the needed information from their EHR systems or to link data across awardee partners, both due to technical challenges and legal restrictions. It was particularly difficult to obtain data not traditionally stored in EHR (such as support services) or for RMOMS participants who transferred out of the network for delivery. Finally, the evaluation seeks to track care, especially for participants whose pregnancies are deemed "high-risk." The definition of high-risk pregnancy was left up to the awardees, based on the patient's clinician or other standards. However, this resulted in very inconsistent definitions between the awardees, variations in high-risk pregnancy determinations between clinical providers within each network, very large shares deemed high-risk, and a lack of consistent EHR flags for high-risk pregnancies to support the RMOMS evaluation.

D. Lessons Learned on the Network Approaches

The RMOMS program tests novel network approaches to address the limited access to maternal health care in rural areas. The early experiences of the 2019 RMOMS Cohort demonstrate some of the benefits of these networks, but also underscore challenges in developing networks to address gaps in services and access to care.

Networks were successful in responding to specific local gaps in care. The RMOMS networks were designed to pull in partners that provide a range of services in their areas. Early successes often involved developing new services or expanding services to other areas. ROAMS, which covers the largest geographic area and least dense population among the three, identified regions with no prenatal or delivery care available before implementation of the RMOMS program. The network engaged with rural hospitals and clinics in those areas to extend prenatal care services. Similarly, the patient navigators served as a new service available to RMOMS participants in all three networks.

Local clinical engagement is valuable for network success. TX-RMOMS and BPN are both led by hospital systems that offer higher levels of maternal care, but are located outside of the service areas. While these hospitals are well positioned to manage the administrative requirements of the cooperative agreement, they have faced challenges in building engagement with local partners. University Health, the TX-RMOMS lead, received few referrals in the RMOMS network, and therefore was not only working from outside the service area, but also shared few patients with network providers. In contrast, the ROAMS lead was the main hospital for one of two branches of the network; it was able to implement a less centralized approach covering a wide geographic service area. The engagement of local clinicians is especially important to build the system of care, including referrals to support services, and to ensure the take-up of network strategies such as telehealth.

Competition for patients can impede network approaches. Clinical partners within the BPN network share service areas and compete for patients. A major hospital system, accounting for nearly one-third of the deliveries in the service area, left the BPN network. It had a long-standing

competitive relationship with the awardee lead. Partners also expressed concerns about the allocation of telehealth equipment and patient navigators, worried in part about the risk of losing patients as telehealth is offered in different locations. Launching services at the lead agency may help achieve early successes, but delays in expansion to additional partner organizations can make these benefits less visible to other partners.

Plan for staffing challenges. The RMOMS programs were launched in the middle of the coronavirus disease 2019 (COVID-19) pandemic, which worsened preexisting staffing shortages in rural health systems. These areas face particular challenges in hiring for specialized positions. All three awardees experienced delays or disruptions due to staffing and turnover. ROAMS lost a social service provider after its director left the agency and was not able to secure a lactation consultant on schedule for one of its two areas. TX-RMOMS faced broad staffing challenges, in part because of the crisis at the border in Del Rio, but the network was also unable to find technicians to train for telehealth initiatives. Agencies in several of the RMOMS areas lost staff due to the COVID-19 vaccination requirement.

Awardees tailored few initiatives to address systemic health disparities among their populations. The RMOMS program contributes toward HRSA's overall goal of increasing health equity. For the RMOMS awardees, this means a focus on improved maternal health care access across their rural regions, including connections to support services and Medicaid coverage. Awardees generally focused on barriers for their overall populations, such as women facing transportation barriers or individuals with high-risk pregnancies, although in some cases, they implemented specific initiatives serving narrower groups, such as health literacy programs or feedback-gathering from local mothers.

E. Next Steps

Despite implementation delays, the three awardees in the 2019 Cohort made progress in strategies to improve maternal health care in their service area. All three awardees have major expansions planned for the second implementation year (September 1, 2021 to August 31, 2022). All three aim to launch telehealth initiatives with MFM specialists. BPN will expand its System Care Coordination model to multiple outpatient clinics and launch the Unite Us automated referral management system. TX-RMOMS will continue to recruit additional staff for its rural health care workforce and address staffing challenges, particularly for specialized positions.

The evaluation will document this ongoing progress and lessons learned to support replication by other similar rural network models. Additional years of patient-level data will also indicate where the networks' successes translate into improved outcomes and where those outcomes are slower to change. The evaluation will also place a greater focus on the sustainability of network strategies at participating clinic sites and Medicaid or other national policy changes to advance maternal health progress. Awardees are starting to make inroads with state Medicaid programs to streamline enrollment, connect participants to Medicaid-funded support services, improve transportation coverage, and provide additional coverage for postpartum care and patient navigation. The evaluation will track these changes, not only for their impact on RMOMS participants in network service areas, but also on expanded access to rural maternal health care in each state.

I. INTRODUCTION

The Health Resources and Services Administration (HRSA) Federal Office of Rural Health Policy (FORHP) and Maternal and Child Health Bureau (MCHB) launched the 2019 Cohort of the Rural Maternity and Obstetrics Management Strategies (RMOMS) program to improve maternal health care access in rural areas of the U.S. The 2019 Cohort funding supports three awardees in Missouri, New Mexico, and Texas that have developed integrated network models to promote greater access to maternal and obstetrics health care, improve maternal and neonatal health outcomes, and improve financial sustainability for obstetrics services. These four components serve as the required Focus Areas for the RMOMS program. The period of performance for the 2019 Cohort (September 1, 2019 to August 31, 2023) includes a planning year and three implementation years.

FORHP contracted Mission Analytics Group, Inc. to conduct an independent evaluation of the 2019 Cohort of the RMOMS program. The evaluation uses a mixed-methods approach to document awardees' models, monitor changes in key access and outcomes measures over time, and disseminate lessons learned for future maternal health networks. This Second Annual Report documents findings from the first implementation year, September 1, 2020 to August 31, 2021, in the context of important maternal health trends from national, state, and county-level secondary data sources.[i] Baseline year findings are available in the First Annual Report.

A. The Rural Maternal Health Landscape

The RMOMS program promotes maternal care networks to address specific challenges in rural maternal health communities. The millions of women of reproductive age living in the rural U.S. have long experienced significant social, health, and economic barriers. Accelerating rates of rural hospital and obstetric unit closures have threatened their limited access to maternal health care, a concerning trend in a country that already has the highest rate of maternal mortality among all high-income countries.[3,4]

Rural Areas Face Hospital Closures and Loss of Obstetrics Services

Financial pressures on rural hospitals include low revenue, low patient volume, staffing shortages, and high levels of uncompensated care, particularly in high-poverty areas with many uninsured patients.[3] Over 130 rural hospitals closed or converted to provide services other than inpatient care between 2010 and January 2022, resulting in a loss of services and access to care.[5] Twenty-one rural hospitals in 13 states closed in 2020 and 2021 alone, almost half the total number of hospitals that closed in 2005–2010.[5]

Rural hospitals sometimes seek out mergers to prevent closure, but merged hospitals are more likely to eliminate maternal health care services than independent hospitals.[6] Obstetric unit closure overall occurs in response to low birth volumes, high malpractice insurance costs, and challenges staffing specialists.[3] Over half of rural counties have no hospital obstetric services to begin with, and rural counties also face greater risk of further loss of services compared to urban counties.[7] Nearly all (98%) of the rural hospitals in one survey identified challenges in staffing

[i] Unless otherwise cited, this Second Annual Report uses awardee data provided directly to the RMOMS evaluation.

their obstetric units and only six percent of obstetrician-gynecologists (OB/GYNS) practice in rural areas.[8,9] The coronavirus disease 2019 (COVID-19) pandemic has also introduced new pressures and led to temporary or permanent closures of obstetric units, sometimes in response to understaffing and staff firings over vaccination mandates.[10] Obstetric unit closures may have a disproportionate impact on women of color, especially Black women, and exacerbate racial disparities in adverse maternal health outcomes.[11,12]

Rural Populations Face Intersecting Barriers to Care

Women in rural areas often struggle with poor transportation options, lower health literacy and educational levels, unplanned pregnancies, and other social pressures.[3] Compared to urban populations, this population faces higher rates of housing insecurity, poverty, and food insecurity as well as lower life expectancy, higher rates of chronic disease, and higher mortality rates from all the leading causes of death.[13–15] Moreover, hospital closures, which can have significant negative impacts on often-struggling rural economies, are more likely to occur in rural areas that are low-income or that have higher proportions of people of color.[16,17]

Women of reproductive age living in rural America face a disproportionate burden from substance use disorder (SUD).[18] One study found that seven percent of pregnant women living in rural areas reported recent non-medical opioid use and that risks were highest for those facing other social barriers, including a less-than-high-school education and reported use of other non-opioid substances.[19] The rate of opioid use among pregnant women increased more rapidly in rural counties than in urban areas from 2007 to 2016.[20] Opioid use during pregnancy is associated with negative health outcomes, including preterm birth, low birthweight, and maternal mortality.[21] Despite the availability of medications to treat opioid use disorder (OUD), a 2021 study of pregnant women with OUD covered by Medicaid insurance found that women living in rural areas and Black women were less likely to receive medications for opioid use disorder (MOUD) than white women and women living in urban areas.[22] Another 2022 study with similar findings showed significant racial disparities in receipt of timely MOUD during pregnancy, reflecting the intersecting barriers to effective care for already-vulnerable populations.[23]

COVID-19 Impacts Maternal Health and Rural Health Systems

The COVID-19 pandemic began during the 2019 Cohort's RMOMS planning year (2019–2020) and led to changes to the maternal health landscape. Congress passed the Families First Coronavirus Response Act in March 2020, which included provisions to ensure continuous insurance enrollment in Medicaid.[24] The Act requires states to maintain continuous Medicaid enrollment for nearly all individuals, including postpartum women, during the public health emergency in order to receive an increase in their federal share of Medicaid payments.[24,25] After the COVID-19 public health emergency and continuous coverage requirement expire, states have up to 12 months to resume their normal eligibility standards.[26] Despite this expanded coverage, the COVID-19 pandemic has resulted in wide-ranging societal impacts on women and pregnant individuals, including restrictions due to stay-at-home orders, increases in depression and anxiety, and decreases in prenatal care attendance, among others.[27,28] Compared to their male counterparts, more women lost their jobs and reported job loss specifically due to a lack of childcare.[27,28] The pandemic also created both widespread layoffs and critical nursing shortages,

especially at small hospitals that struggle to match signing bonuses offered by larger hospitals or that cannot pay high rates for travel nurses to fill in staffing gaps.[28–30]

Beyond the pandemic's societal impact, COVID-19 infection during pregnancy increases the risk of severe maternal health outcomes. A large study published in November 2020 found that pregnant women with symptomatic COVID-19 infection had a 70 percent higher risk of death than non-pregnant women, and higher risk of other negative health outcomes, such as intensive care unit (ICU) admission.[31] Other studies have confirmed that COVID-19 infection during pregnancy increases the risk of maternal death, severe maternal morbidity, and other negative maternal health outcomes.[32,33] Hispanic and non-Hispanic Black women had the highest risk of negative outcomes in at least one study.[34] One study showed that 15 pregnant women, nine of whom were non-Hispanic Black, died of COVID-19-associated causes between March 2020 and October 2021 in Mississippi, a state that had fewer than 10 pregnancy-related deaths from any cause in 2018.[35,36]

Other studies have highlighted the risk of COVID-19 infection and harmful infant health outcomes. A study of over 1.2 million delivery hospitalizations found a significantly increased risk of stillbirth among women with COVID-19 compared to women without COVID-19.[37] Another study of COVID-19 infection during pregnancy in 18 countries found that newborns born to women with COVID-19 had higher risk of severe neonatal morbidity, compounding the increased risk of maternal morbidity to their mothers.[38]

The CDC recommended COVID-19 vaccination during pregnancy beginning in August 2021, nearly 18 months into the pandemic.[39] Only about 40 percent of pregnant individuals in the U.S. had received a complete vaccination as of early 2022, demonstrating significant barriers and delays in uptake among this population.[40]

Maternal Deaths Continue to Rise

The U.S. maternal mortality rate rose to 23.8 deaths per 100,000 live births in 2020, an increase from the 2019 rate of 20.1.[41] Rates for women of color increased significantly, resulting in a maternal mortality rate for non-Hispanic Black women of nearly three times the rate for white women.[41] Maternal deaths from any cause can occur across the continuum of care and most deaths (two-thirds) are preventable.[42] More than one-third of maternal deaths occur in the postpartum period when many rural women have no source of ongoing primary care.[43] New national-level research shows that death by homicide during or within 42 days of pregnancy eclipses all other causes of maternal mortality, that the risk is highest for Black women, and that pregnant women specifically experience higher risk of homicide than women who are not pregnant.[44,45] Intimate partners commit up to two-thirds of pregnancy-associated homicides, and up to 50 percent of women experience intimate partner violence (IPV) during pregnancy.[45,46]

Severe maternal morbidity (SMM), or complications from unexpected and negative maternal health outcomes, has also increased in recent years.[47] SMM and mortality increased for both rural and urban populations between 2007 and 2015, but women living in rural areas had a nine percent greater probability of experiencing SMM or maternal mortality.[13] A 2021 report from the Government Accountability Office found that between 2011 and 2016, pregnancy-related deaths per 100,000 live births were higher in rural areas than in metropolitan areas.[48] New research

shows that SMM also has negative impacts on infant health, including increased costs at delivery and longer lengths of hospital stay.[49] Like maternal mortality, the risk of SMM persists beyond the hospital stay; among women with Medicaid insurance in 2010–2014, about one in six SMM cases occurred within six weeks of discharge.[47]

Looking Ahead

The 2020 Department of Health and Human Services (HHS) Action Plan to Improve Maternal Health in America focuses on improving chronic health conditions during pregnancy, reducing low-risk Cesarean section (C-section) deliveries, and reducing maternal deaths across the pregnancy continuum.[50] Since publication, the COVID-19 pandemic has evolved and will continue to pose changing risks to maternal health as viral variants emerge, new treatments and preventive medications become available, and more research provides insight into the risks of COVID-19 during pregnancy. Addressing the pandemic in the rural maternal health setting, an arena already facing numerous intersecting challenges, calls for a greater focus on ensuring access to high-quality, comprehensive, and consistent care for all women of reproductive age and all individuals requiring maternal health services throughout the continuum of care.

B. The RMOMS Program and Evaluation

The RMOMS program promotes a network model approach to increase access to prenatal and obstetrics care and to improve maternal and infant health outcomes. The program has four Focus Areas: 1) rural hospital obstetric service aggregation to support low-volume services; 2) a network approach to coordinate and improve the continuum of maternal health care from preconception to postpartum; 3) the use of telehealth services to increase access to care in rural areas; and 4) payment structures that promote financial sustainability and sustain access to high-quality care in the long term.

The three RMOMS awardees in the 2019 Cohort include**:**

1. **Missouri Bootheel Perinatal Network (BPN):** BPN aims to improve maternal and infant health in Dunklin, Mississippi, New Madrid, Pemiscot, Scott, and Stoddard counties in the southeastern Bootheel region of Missouri.
2. **New Mexico Rural Obstetrics Access and Maternal Services (ROAMS):** The ROAMS network aims to provide integrated maternal health care and services to women living in Colfax, Taos, Union, Mora, and Harding counties in northeastern New Mexico.
3. **Texas-RMOMS Comprehensive Maternal Care Network (TX-RMOMS):** The TX-RMOMS network aims to improve access to comprehensive, integrated obstetric services for women residing in Val Verde, Uvalde, Edwards, Real, Kinney, and Zavala counties in southwest Texas.

All three awardees receive technical assistance support from the Maternal Health Learning and Innovation Center.

The evaluation centers around research questions in four primary areas:

1. **Network Approach to Coordinating Care:** The RMOMS awardees create networks of clinical care, support services, and leadership partners to provide comprehensive and

integrated maternal health care. The evaluation documents network design, partner types, collaboration activities, challenges, and "lessons learned" to support potential future replication of network models that may improve maternal health access and quality of care in rural regions.

2. **Delivery and Access to Preconception, Pregnancy, Labor and Delivery, and Postpartum Services:** The RMOMS program interventions span the continuum of care from preconception to postpartum, encompassing both preventive and pregnancy-related services for RMOMS participants. These services include clinical care and supportive services, such as access to educational sessions or referrals to home visiting programs. The evaluation documented pre-implementation baseline patterns in the First Annual Report and builds on those findings in this Second Annual Report to capture trends in service utilization and access over time. The report also focuses on several specific topics, including telehealth utilization and care for RMOMS participants with high-risk pregnancies, to capture the RMOMS awardees' innovative and impactful strategies for women facing barriers to care or greater risks during pregnancy.
3. **Maternal and Neonatal Outcomes:** The RMOMS evaluation assesses how the RMOMS awardees' strategies impact maternal and neonatal health outcomes, such as preterm birth, SMM, and low infant birthweight. The Second Annual Report presents "core tables" in each awardee chapter to show rates of selected outcomes, illustrate trends over time, and allow for limited cross-awardee comparisons. Awardee chapters also contain additional outcomes data corresponding to the awardee's unique program goals and strategies. The evaluation examines health disparities by different demographic characteristics and high-risk pregnancy status to learn more about whether and how awardees tailor care for their higher-need populations.
4. **Financial Sustainability and Viability:** HRSA developed the RMOMS model with goals of generating savings for payers, promoting efficiencies in care, and ensuring sustainability of awardees' maternal health strategies. This Second Annual Report documents whether and how awardees have focused on sustainability in the first implementation year and describes their efforts to reduce high-cost, high-intensity services, such as infant NICU stays, that may result in future cost savings. Over time, successful implementation of the awardees' strategies may result in better preventive care and more timely treatment for costly health conditions during pregnancy.

Appendix B: Evaluation Research Questions contains the full list of evaluation research questions.

C. Roadmap to the Second Annual Report for the 2019 Cohort

The Second Annual Report for the 2019 Cohort of the RMOMS program focuses on the first implementation year (September 1, 2020 to August 31, 2021). September 1, 2020 represents the formal implementation "start date" for the three RMOMS awardees, building on their preparatory work during the planning year (September 1, 2019 to August 31, 2020).

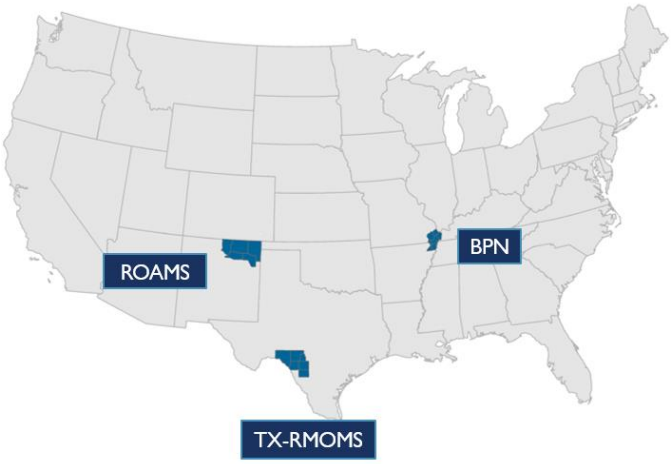
Data in this Second Annual Report demonstrate early implementation findings, highlight successes and barriers to implementation, and outline future considerations as awardees work to overcome network challenges. The report begins with an overview of the state maternal health and policy landscape for each awardee's state and then presents findings from each awardee's unique program in three detailed chapters. It then compares the overall findings in a comparative chapter and details future activities for both the RMOMS awardees and the evaluation. The appendices contain an overview of the primary and secondary data sources that inform the RMOMS evaluation and a complete listing of the evaluation research questions.

II. AWARDEE STATE LANDSCAPE

The three 2019 Cohort Rural Maternity and Obstetrics Management Strategies (RMOMS) program awardees operate in Missouri, New Mexico, and Texas and reflect diverse populations and regional maternal health challenges (described below).

A. Awardee Areas

Figure II-1: RMOMS Awardees



The Bootheel Perinatal Network (BPN) serves over 30,000 women of reproductive age in six counties – Dunklin, Mississippi, New Madrid, Pemiscot, Scott, and Stoddard – in the southeast corner of Missouri, known as the Bootheel.[51] The six-county population is largely white, with small Black and Hispanic minorities (13% and 3%, respectively).[52] The Bootheel experiences worse infant and maternal health outcomes than women in the state and the nation overall, with large racial disparities between white and Black women.[53] Access to local maternal health care is limited. According to BPN staff, two major hospitals discontinued obstetric services in 2014 and 2018, leaving many women in the region with no local services. BPN aims to address these access issues so that women do not have to leave the state or travel more than an hour in Missouri to receive maternal health services.

The Rural OB Access and Maternal Services (ROAMS) network serves over 9,000 women of reproductive age in Taos, Colfax, Union, Mora, and Harding counties in northeastern New Mexico.[51] Network staff report that women and families living in this rural, mountainous region face significant maternal health challenges, including limited access to prenatal care, no access to local in-person care for high-risk pregnancies, and high rates of substance use disorder (SUD), diabetes, and other chronic health conditions. The network serves a majority-Hispanic population (51%), a smaller American Indian/Alaska Native (AI/AN) population (4%), and a very small (<1%) Black population in the five-county RMOMS region.[52]

The TX-RMOMS Comprehensive Maternal Care Network (TX-RMOMS) serves over 20,000 women of reproductive age across six counties (Val Verde, Uvalde, Edwards, Real, Kinney, and Zavala counties) in two service areas: Val Verde and Uvalde.[51] Val Verde's county seat is Del Rio, which borders the Rio Grande, while Uvalde is about 114 miles southeast of Val Verde and 85 miles west of San Antonio. TX-RMOMS serves a majority-Hispanic population (76%) and a very small Black population (1%) in the six-county service area.[52] The network reports that the population faces numerous maternal health barriers, including poverty, lack of insurance, and young maternal age.

B. Maternal and Infant Health in Awardee States

National Vital Statistics System (NVSS) data (2020) offers a snapshot of key prenatal and delivery measures by state and for non-metropolitan counties within the state. 2020 data for the RMOMS counties were not available at the time of publication.

Prenatal and Delivery Utilization

Prenatal and delivery utilization data provide an understanding of racial disparities for selected indicators: timely prenatal care, number of prenatal visits, and Cesarean section (C-section) deliveries. Table II-1 shows these metrics with comparisons between non-Hispanic white women and the next largest demographic group for each awardee: Black women in Missouri and Hispanic women in New Mexico and Texas.

Table II-1: Prenatal and Delivery Measures in Awardee States, 2020

Measure	First Trimester Prenatal Care	Fewer than Five Prenatal Care Visits	C-section Rate
Healthy People 2030 Target	80.5%	NA	24%
National Average	76%	6%	32%
Missouri Statewide Average	**73%**	**7%**	**29%**
Non-metro counties – White women	75%	7%	28%
Non-metro counties – Black women	64%	18%	37%
New Mexico Statewide Average	**68%**	**11%**	**26%**
Non-metro counties – White women	68%	8%	25%
Non-metro counties – Hispanic women	65%	12%	28%
Texas Statewide Average	**68%**	**9%**	**35%**
Non-metro counties – White women	73%	6%	34%
Non-metro counties – Hispanic women	62%	9%	35%

Notes: The Healthy People 2030 target for first trimester prenatal care is for "early and adequate prenatal care" using an index that calculates first trimester prenatal care attendance. The target for C-section rates is for low-risk, first-time pregnancies. Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System Restricted Natality Data 2020, and U.S. Department of Health and Human Services, Healthy People 2030.

According to NVSS data (2020) accessed and analyzed by the evaluation, white women living in the non-metropolitan counties in Missouri report similar rates of few prenatal care visits, timely initiation of prenatal care, and fewer C-sections when compared to state and national averages. However, performance on these metrics is worse for Black women, who are less likely to receive timely prenatal care, more likely to have fewer prenatal visits, and more likely to experience C-sections than both white women and the statewide average. Additionally, C-section rates in Missouri overall (29%) are higher than the target for low-risk, first-time pregnancies (23.6%) outlined in Healthy People 2030, although slightly lower than the national average (32%).[2]

White women living in non-metropolitan areas of New Mexico report similar rates of early prenatal care initiation, are slightly more likely to have at least five prenatal care visits, and are slightly less likely to have a C-section when compared to the state as a whole.[49] However, like Black women in Missouri, Hispanic women in New Mexico report poorer measures. C-section

rates are lower in New Mexico than they are in the nation as a whole, but still higher than the Healthy People 2030 target.[50]

White women living in the non-metropolitan counties in Texas report slightly better performance than the state average for all three measures, though they do not yet meet Healthy People 2030 goals. Like New Mexico, Hispanic women living in non-metropolitan areas of Texas are less likely to receive prenatal care in the first trimester, and are more likely to have fewer than five prenatal care visits and C-sections than white women.[49]

Infant Health Outcomes

The rates of preterm birth (birth before 37 weeks of gestation) and low birthweight (birthweight less than 2,500 grams) among white women in non-metropolitan areas of Missouri, New Mexico, and Texas are similar or better than the national and state averages.[53] Rates for Hispanic women in Texas and New Mexico are also comparable, though they may be slightly elevated compared to white women in the states. However, rates of preterm birth and low birthweight for Black women in non-metropolitan areas of Missouri are higher than for white women in the state and the national averages. Rates of preterm birth among white women in non-metropolitan areas of New Mexico meet the Healthy People 2030 target (9.4%).[2]

Table II-2: Infant Health Outcomes, 2020

Measure	Preterm Birth	Low Birthweight
Healthy People 2030 Target	9.4%	NA
National Average	10%	8%
Missouri Statewide Average	**11%**	**9%**
Non-metro counties – White women	11%	8%
Non-metro counties – Black women	15%	14%
New Mexico Statewide Average	**10%**	**9%**
Non-metro counties – White women	9%	8%
Non-metro counties – Hispanic women	10%	9%
Texas Statewide Average	**11%**	**8%**
Non-metro counties – White women	10%	7%
Non-metro counties – Hispanic women	11%	8%

Notes: Preterm birth is before 37 weeks gestation. Low birthweight is less than 2,500 grams. Sources: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System Restricted Natality Data 2020 and Healthy People 2030 data.

Environmental and Neighborhood Context in the Awardee States

Neighborhood and environmental indices can provide insight into the social determinants of health factors that influence maternal health access and outcomes. Two indices, the U.S. Maternal Vulnerability Index (MVI) and the Area Deprivation Index (ADI), reveal significant socioeconomic deprivation and vulnerability to poor maternal health outcomes in the RMOMS states.

The MVI, an open-source data tool, combines indicators related to reproductive health, mental and physical health, access to care, physical environment, and socioeconomic status to rank

"maternal vulnerability" in U.S. counties on a scale of "very low" to "very high."[54] Missouri overall has high maternal vulnerability, but the six RMOMS counties all have "very high" maternal vulnerability. New Mexico performs similarly to Missouri at the state level with "high" maternal vulnerability, but the five ROAMS counties vary from "low to high." Texas has the worst maternal vulnerability score ("very high") of the three RMOMS states, but the six RMOMS counties range from "very low" to "very high."[54] Overall, all three awardee states have "high" maternal vulnerability, and both TX-RMOMS and ROAMS have substantial county-level variation, but BPN has consistently worse vulnerability in all six RMOMS counties compared to the statewide ranking.

Another publicly available index, the ADI, ranks neighborhoods by level of socioeconomic disadvantage and provides insight into local-level challenges in the RMOMS counties.[55,56] The ADI uses different socioeconomic indicators that are not maternal health-specific, including poverty, education, housing, and employment indicators from U.S. census data, to indicate levels of neighborhood disadvantage that are correlated with negative health outcomes.[56] While the ADI does not assess maternal vulnerability specifically, it indicates higher levels of deprivation or disadvantage in census tracts that score at approximately the 70th percentile or higher in national decile rankings. The evaluation used this cutoff to identify higher-deprivation census tracts in the RMOMS counties.

In the Missouri RMOMS counties, approximately three-quarters or more of the county census tracts rank in the 70th percentile or higher on the index, compared to just 40 percent of census tracts in the state overall. These findings indicate that most census tracts in all RMOMS counties in Missouri face high deprivation. ADI scores vary more for New Mexico and Texas than for Missouri. The percentage of census tracts scoring at the 70th percentile or higher (indicating more deprivation) ranges from 18 percent in New Mexico's Taos County to 100 percent in both Mora and Harding counties compared to 41 percent statewide, reflecting significant variation in deprivation in the RMOMS service area compared to the state.[55,56] In Texas, the percentage of census tracts scoring at the 70th percentile or higher ranges from 50 percent in Uvalde County to 100 percent in both Real and Kinney Counties compared to 59 percent in the state, demonstrating variation in deprivation within the RMOMS service area and generally worse performance than the state overall.[55,56]

Table II-3: RMOMS County Performance on the U.S. Maternal Vulnerability Index[54] and the Area Deprivation Index[55,56]

	MVI	ADI	
RMOMS County	**Level of Maternal Vulnerability**	**Number of Census Tracts in State or County**	**Percent of Census Tracts at 70th Percentile or Higher (2019)**
Missouri Statewide	**High**	**4,420**	**48%**
Stoddard	Very high	26	73%
Scott	Very high	35	77%
Mississippi	Very high	12	92%

	MVI	ADI	
RMOMS County	**Level of Maternal Vulnerability**	**Number of Census Tracts in State or County**	**Percent of Census Tracts at 70th Percentile or Higher (2019)**
Dunklin	Very high	33	91%
Pemiscot	Very high	19	95%
New Madrid	Very high	21	90%
New Mexico Statewide	**High**	**1,421**	**41%**
Taos	Low	22	18%
Union	Low	3	67%
Colfax	Moderate	16	75%
Mora	Low	5	100%
Harding	High	1	100%
Texas Statewide	**Very high**	**15,514**	**59%**
Val Verde	Moderate	34	72%
Uvalde	High	18	50%
Edwards	Moderate	2	67%
Real	Moderate	3	100%
Kinney	High	3	100%
Zavala	Very high	9	59%

Notes: ADI counts presented in this table reflect census blocks for which data are available. A small amount of census block data is suppressed due to low population, low housing, and/or high group quarters population. An ADI score at the 70th percentile or higher using national percentile data indicates higher levels of deprivation. Source: U.S. Maternal Vulnerability Index data (year of data varies) and Area Deprivation Index data (2019).

C. Overview of State Policies and Funding Landscapes

Congress passed the Families First Coronavirus Response Act in March 2020, which included provisions to ensure continuous insurance enrollment in Medicaid.[24] The Act requires states to maintain continuous Medicaid enrollment for nearly all individuals, including postpartum women, during the public health emergency in order to receive an increase in their federal share of Medicaid payments.[24,25] After the COVID-19 public health emergency and continuous coverage requirement expire, states have up to 12 months to resume their normal eligibility standards.[26] The American Rescue Plan Act of 2021 allows states to elect a Medicaid postpartum coverage expansion using a state plan amendment (SPA) beginning on April 1, 2022 and lasting for five years; the Centers for Medicare and Medicaid Services (CMS) provided additional guidance for states exploring this option in December 2021.[57] State actions related to these provisions and other characteristics of the state landscape are detailed in the table below.

Table II-4: Medicaid and Policy Landscape in the RMOMS States

	BPN (Missouri)	ROAMS (New Mexico)	TX-RMOMS (Texas)
Medicaid Policy			
Program Name	MO HealthNet	Centennial Care	Medicaid
Births Covered by Medicaid (2020)[58]	39%	54%	50%
Income Requirement for Pregnant Women (2021)[59]	201% of Federal Poverty Level (FPL)	255% of FPL	203% of FPL
Uninsured Rate Among Women Ages 19-64 (2020)[60]	11%	14%	22%
Length of Postpartum Coverage[57]	Previously 60 days. Missouri has a CMS-approved Section 1115 waiver to offer limited Medicaid benefits (mental health and substance use treatment) up to one year postpartum for beneficiaries with SUD. However, as of April 2022, Missouri plans to pause implementation of the waiver and pursue a 12-month postpartum coverage extension through the American Rescue Plan Act of 2021 SPA provision.	Previously 60 days. As of April 2022, New Mexico has implemented a 12-month postpartum coverage extension through the American Rescue Plan Act of 2021 SPA provision.	Previously 60 days. As of April 2022, Texas has received federal approval to enact a six-month postpartum coverage period and also has pending state legislation to further expand postpartum Medicaid coverage. Texas has provided some extended postpartum services to a limited number of women in the Healthy Texas Women program, a statewide family planning program, since September 2020.[57,61]
Medicaid Expansion under the Affordable Care Act[62]	Missouri expanded Medicaid via ballot measure in 2020 and begin implementing expansion in October 2021 with retroactive coverage to July 1, 2021.	Expanded.	Not expanded.
Medicaid Core Measure: Prenatal Visits[63]	Most women (92%) enrolled in Medicaid or the Children's Health Insurance Program (CHIP) in Missouri in FFY 2020 received a prenatal visit either: 1) in the first trimester, 2) on or before the enrollment start date, or 3) within 42 days of enrollment in Medicaid or CHIP. This percentage is higher than the average (80%) for the 40 states that submitted data for this Child Core Set measure.	Most women (82%) enrolled in Medicaid or CHIP in New Mexico in FFY 2020 received a prenatal visit either: 1) in the first trimester, 2) on or before the enrollment start date, or 3) within 42 days of enrollment in Medicaid or CHIP. This percentage is slightly higher than the average (80%) for the 40 states that submitted data for this Child Core Set measure.	Texas did not report data on the percentage of its Medicaid and/or CHIP population that received a prenatal visit either: 1) in the first trimester, 2) on or before the enrollment start date, or 3) within 42 days of enrollment in Medicaid or CHIP. The average percentage for the 40 states that submitted data for this Child Core Set measure is 80 percent.
Medicaid Core Measure: Low Birthweight[63]	Among deliveries with Medicaid insurance in Missouri in FFY 2020, 11 percent of infants had low birthweight (<2,500 grams). This percentage is slightly worse than the average (10%) for the	Among deliveries with Medicaid insurance in New Mexico in FFY 2020, 10 percent of infants had low birthweight (<2,500 grams). This percentage is approximately the same as the	Among deliveries with Medicaid insurance in Texas in FFY 2020, 9 percent of infants had low birthweight (<2,500 grams). This percentage is slightly better than the average (10%) for the 52

	BPN (Missouri)	ROAMS (New Mexico)	TX-RMOMS (Texas)
	52 states that submitted data for this Child Core Set measure.	average (10%) for the 52 states that submitted data for this Child Core Set measure.	states that submitted data for this Child Core Set measure.
Title V Funding[64]	Missouri received over $12 million in federal funding from the HRSA MCHB Title V program for FFY 2020.	New Mexico received over $4 million in federal funding from the HRSA MCHB Title V program for FFY 2020.	Texas received over $35 million in federal funding from the HRSA MCHB Title V program for FFY 2020.
AIM Maternal Safety Initiative Bundles	Severe Hypertension in Pregnancy, Obstetric Hemorrhage, and Obstetric Care for Women with Opioid Use Disorder bundles	Obstetric Hemorrhage, Severe Hypertension in Pregnancy, Substance Use Disorder, and Racial/Ethnic Disparities bundles.[65]	Obstetric Hemorrhage (primary focus), Obstetric Care for Women with Opioid Use Disorder, and Severe Hypertension bundles.[66]
HRSA FORHP Funding	Rural Health Network Development Planning Program, Rural Health Network Development Program, Rural Health Care Services Outreach Program, Small Health Care Provider Quality Improvement Program, and Delta States Rural Development Network Grant Program.	Black Lung Clinics Program, Rural Health Care Services Outreach Program, Rural Health Care Coordination Program, Rural Health Network Development Planning Program, and Rural Health Network Development Program.	Rural Health Care Services Outreach Program.
Broadband Access[67]	While broadband access is more limited in RMOMS counties than in urban areas in Missouri, all RMOMS county residents are served by at least two broadband providers.	While broadband access is more limited in ROAMS counties than in urban areas in New Mexico, all ROAMS county residents are served by at least two broadband providers.	In the rural areas of the RMOMS counties in Texas, broadband access is more limited than in urban areas. However, all TX-RMOMS county residents are served by at least two broadband providers.
COVID-19 Cases[68]	There were over 760,000 cumulative COVID-19 cases statewide by the end of the first implementation year (August 31, 2021).	There were over 230,000 cumulative COVID-19 cases statewide by the end of the first implementation year (August 31, 2021).	There were almost 3.6 million cumulative COVID-19 cases statewide by the end of the first implementation year (August 31, 2021).
COVID-19 Vaccinations[69]	Just over 55 percent of the adult population had completed a COVID-19 vaccination series by August 31, 2021.	Just over 72 percent of the adult population had completed a COVID-19 vaccination series by August 31, 2021.	Just over 58 percent of the adult population had completed a COVID-19 vaccination series by August 31, 2021.

Notes: Data that are not otherwise cited were provided by HRSA and/or the RMOMS awardees directly.

III. BOOTHEEL PERINATAL NETWORK (MISSOURI)

BPN, led by Saint Francis Healthcare System, has the largest and most diverse network of the three awardees, with a mix of hospital systems, home visitation programs, behavioral health agencies, and public health departments. In the first implementation year, BPN provided care coordination to help connect RMOMS participants to existing social supports. It also laid the groundwork for telehealth and an automated referral management system, among other activities. This chapter reviews the network's composition, the primary goals and activities of the network model, and maternal and infant outcomes during the first implementation year.

A. RMOMS Network Characteristics

Saint Francis, a hospital system in the Bootheel region, anchors this large and complex network. Ongoing members of the network include clinical providers, Missouri Delta Medical Center (MO Delta), a hospital system, and SEMO Health Network, a Federally Qualified Health Center (FQHC) network. Missouri Bootheel Regional Consortium (MBRC) provides home visitation, and Gibson Recovery Center, Bootheel Counseling Services, and FCC Behavioral Health provide behavioral health support and substance use disorder (SUD) treatment. The Bootheel Network for Health Improvement (BNHI) encompasses the six county health departments. In addition to these formalized partnerships, BPN has an extensive network of informal social support partners, creating a more equitable environment for accessing care and services.

BPN also includes partners that support the management and reach of RMOMS activities. Bootheel Babies and Families (BBF) and Southeast Missouri State University support education and data management. SSM Health Perinatal Center, a hospital system located in St. Louis, also continues to be an active network member, providing technical support and serving as the tertiary–quaternary center for high-risk pregnancy referrals. Finally, BPN continues to collaborate with MO HealthNet, the state Medicaid program, by participating in statewide work groups to share feedback on Medicaid policy and challenges unique to rural areas. Table III-1 contains a full list of partners and roles.

Outside of these relationships, BPN's network composition has fluctuated since the start of the RMOMS program. A major hospital system, SoutheastHEALTH, and its affiliated home visitation program exited the network in the first implementation year. Pemiscot Memorial and Poplar Bluff Regional were invited to join the network, but declined during the planning period due to concerns with the cost of a regional health information exchange (HIE) and the staffing time necessary for the required data collection. Pemiscot Memorial has since joined the network, and Poplar Bluff Regional Medical Center has engaged with the RMOMS 2021 Cohort. The HIE was initially proposed under RMOMS, but then later halted by the medical centers.

Table III-1: RMOMS Network Partners

Network Partner	Network Role	Continuing	Declined and Later Joined	Declined	Left Network
Saint Francis Healthcare System	Hospital system	Awardee Lead			
MO Delta Medical Center	Hospital system	●			
SEMO Health Network	FQHC network	●			
MBRC	Home visitation	●			
Bootheel Babies and Families (BBF)	State data and automated referral management system	●			
Southeast Missouri State University	Education	●			
BNHI (six county public health departments)	Future telehealth host sites	●			
Three behavioral health agencies (Gibson Center, Bootheel Counseling Services, and FCC Behavioral Health)	Mental health and SUD treatment	●			
SSM Health Perinatal Center	Hospital system; technical support	●			
MO HealthNet	State Medicaid program	●			
Pemiscot Memorial	Hospital system (non-delivering)		●		
Poplar Bluff Regional Medical Center	Hospital system (outside of service area)			●	●
SoutheastHEALTH	Hospital system				●
Building Blocks/Nurse–Family Partnership	Home visitation				●

Notes: While several BPN partners have maintained longstanding relationships with SEMO University, this organization is newly included in the network partner list because an RMOMS partnership was formalized during the first implementation year.

These changes in the network's composition reflect the challenges rural providers face in implementing collaborative efforts. Small health care systems, often strapped for resources, may prioritize activities that generate immediate benefits for their patients over longer-term collaborations. Staff turnover can also hamper progress, especially at sites where only one or two staff members support network activities. Most importantly for BPN, the rural providers in its service area compete for the same patients in a small population base. BPN partners made a large number of referrals for support services (484 referrals for 1,300 RMOMS participants in the first

implementation year). However, RMOMS participants typically receive clinical care within the same health system, indicating that clinical providers may be unlikely to refer to external network providers. Concerns over which sites should receive program resources, such as telehealth equipment and patient navigators, have exacerbated this sense of competition among some network partners. To date, the majority of BPN's activities are managed by and housed within Saint Francis with plans for eventual expansion. This tiered approach allows the network to refine its wider roll-out based on early lessons learned, but it leaves other network partners feeling less invested in network activities.

BPN hopes that the expansion of RMOMS services to more partners in the second implementation year will strengthen the network. As described in detail in Section B, more partners will gain access to System Care Coordination services, an automated referral management system, and telehealth. More partners actively involved in RMOMS programmatic activities will naturally increase cross-partner referrals and collaboration.

After focused conversations in the multiple workgroups, BPN streamlined partner collaboration during the first implementation year. Instead of hosting six workgroup meetings, which largely consisted of the same partner representatives, BPN now holds two formal monthly meetings: BPN Connect and Governance Meeting. BPN Connect meetings keep all interested representatives from formal and informal network partners updated on implementation progress, community resources, funding, and educational opportunities. All community agencies that provide services to families in the Bootheel are welcome to attend to hear and share information. During Governance Meeting sessions, leaders from each site offer feedback and collaborate on key network decisions. Network partners appreciate this change to fewer, more efficient virtual meetings, with the understanding that focused workgroup meetings will be scheduled as needed. BPN also continues outreach to partner staff to provide education on network goals and activities, and communicates regular project updates via email.

B. Network Model and Goals

BPN's network model includes four main components. The two major network strategies to improve maternal and infant health outcomes include System Care Coordination (the network's formal care coordination initiative) and telehealth. BPN is poised to launch a new automated referral management system strategy. Under its final strategy, provider capacity building, BPN is ready to launch an emergency medical services (EMS) obstetric virtual training course, developed and taught by SSM Health, and continues to hold health equity conversations.

System Care Coordination

BPN made considerable progress on care coordination by onboarding a System Care Coordinator (SCC) to connect RMOMS participants to services, including home visitation, mental health, and Medicaid managed care organization (MCO) support. During the first implementation year, the SCC worked with 45 women and made 130 referrals, numbers that are quickly growing. The SCC serves to:

Enroll RMOMS participants and assess behavioral health and social needs: The SCC serves individuals who are referred to maternal–fetal medicine (MFM) services at Saint Francis and plans to expand services to other outpatient clinics throughout the Bootheel. BPN will place

electronic tablets in waiting rooms of other clinics so patients can complete a short questionnaire with their name and contact information and consent for the SCC to reach out to them. The SCC utilizes the Edinburgh Postnatal Depression Scale (EPDS) and the Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences (PRAPARE) assessment tools to identify the needs and strengths of enrolled participants and to encourage them to share personal stories.

Refer to social supports: The SCC leverages support services offered by network partners and other area agencies to address identified needs. Home visitation serves as a primary referral. The home visitation programs in the Bootheel have slightly different eligibility criteria, service areas, home visitor qualifications (i.e., nurses versus case managers), and available supports. After working with RMOMS participants to choose which program best meets their needs, the SCC emails a completed referral form and communicates with a contact person at the home visiting program to ensure successful follow-through.

Referrals Made by the SCC to Connect RMOMS Participants to Services

- 76 referrals to network partners
- 54 referrals to non-network partners

The SCC also refers RMOMS participants to other support services, especially if they opt out of home visitation. For example, the SCC educates participants on services available through their Medicaid MCOs, which might include a prepaid phone, mileage reimbursement, transportation, a breast pump, and home-delivered meals as well as case management during the postpartum period. Many women in the area are unaware of these services, and BPN hopes to conduct a wider educational campaign to improve knowledge and access. In addition, given the SCC's extensive local experience, she can connect participants to the dozens of governmental, non-profit, and religious organizations that offer nutrition support, educational programs, housing supports, and baby supplies, such as diapers wipes, clothes, car seats, and safe sleep areas. For example, the SCC coordinated Supplemental Nutrition Assistance Program (SNAP) enrollment via telephone for one RMOMS participant and worked with two home visiting agencies to ensure that another mother had a safe car seat and a safe space for her baby to sleep.

"They know they can go to the doctor [covered by Medicaid] and that's it. They are unaware that they have vision and dental coverage or access to transportation and other benefits. The type of coverage, who the managed care provider is, or how to get their card isn't always known either." – BPN Leadership

Some participants have been hesitant to access these support services because they pride themselves on being independent or fear social stigma. The SCC communicates that "these services are here for a reason, and everybody struggles at some point. It's okay to not be okay sometimes." She emphasizes that services are available and useful for everyone regardless of income. Home visitation can also be a hard sell for RMOMS participants who are concerned with having "strangers" in their homes, potentially judging their behavior. The SCC encourages participants to discuss alternative visiting schedules or visit places with the home visiting program and shares these concerns with the agency when making the referral.

Health insurance enrollment support and navigation have become an increasingly important part of the SCC's role. For example, when a procedure was not scheduled by another agency due to misinformation regarding a preauthorization completed by the MFM provider, the SCC rectified the issue and was able to get it scheduled just a few days before the preauthorization period ran out. She also provided a Medicaid MCO with a notification of pregnancy to eliminate a bill for a service that should have been covered, therefore providing important support for complex and time-consuming insurance issues.

Provide emotional support and refer to mental health providers: The SCC uses her nursing background to support women who are experiencing high-risk pregnancies or other traumatic events. Women often face barriers to accessing more formal mental health services, including work and childcare commitments. They often deprioritize their own mental health, putting their family's needs before their own. These challenges make the emotional support provided by the SCC even more necessary. For example, the SCC hopes to help one RMOMS participant with pregnancy complications and eventually "get her to feel comfortable with talking with [a therapist]. But she's just not there." When one participant told the SCC that she had no support system at home, the SCC was able to provide immediate support and refer her to other programs for continued services. The SCC also provides necessary help to individuals who suffer a pregnancy loss, as they often no longer qualify for pregnancy-related services.

Challenges with Medicaid Enrollment and SCC Support

While Medicaid enrollment has historically been cumbersome in Missouri, state and county staff are particularly overworked due to the recent expansion of Medicaid in Missouri. Individuals may wait on hold for eight hours only to be disconnected. They may hear conflicting information about their eligibility status and not receive official notification until 70 days after submitting the application. The SCC plays a crucial role in navigating these issues to promote coverage, and BPN hopes that a more streamlined enrollment process will free up the SCC's time to focus on other needs.

Follow up with participants: Continual follow-up contacts help ensure that RMOMS participants access their referrals and receive ongoing support. The SCC contacts them within one to two weeks of the initial visit and then at regular intervals based on patient needs. She also makes reminder calls for prenatal visits and follows up to identify and resolve barriers for anyone who misses an appointment. Text messages serve as an important communication tool, especially for women who have Wi-Fi access but no phone minutes. The SCC also reported that RMOMS participants can feel more comfortable communicating candidly via text than over the phone or in person, which leads to more efficient identification and resolution of needs.

The SCC is co-located in the MFM clinic at Saint Francis and has direct access to each RMOMS participant's full health record, which facilitates regular communication with the MFM provider and medical assistant about participant needs. As BPN expands the scope of the System Care Coordination effort into prenatal clinics not affiliated with Saint Francis, the network will need to ensure that information on each patient remains available to multiple providers.

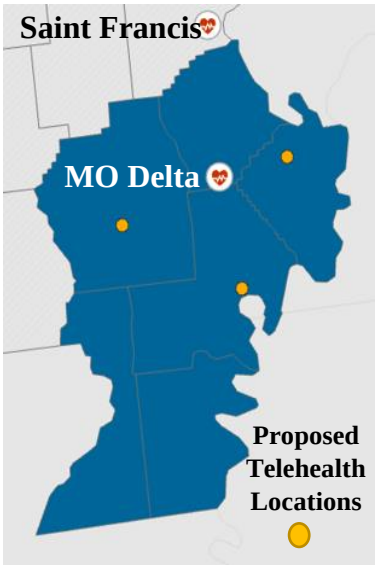
BPN also plans to use the data generated by the System Care Coordination approach for continuous quality improvement. Quantitative data on referrals made but not completed, coupled with feedback from RMOMS participants, can help BPN identify and address barriers to care. For example, if participants opt out of home visitation, BPN can ask them about their concerns and assess whether different interventions may provide more appropriate support.

Telehealth

BPN expects its telehealth initiative to become operational in the second implementation year. It has been slow to launch, primarily due to procurement issues. Through a United States Department of Agriculture (USDA) grant, SSM Health will place telehealth equipment in local health departments (New Madrid and Mississippi), and one SEMO Health Network prenatal care clinic. SSM Health will provide an ultrasound technician trained in Level 2 ultrasound and nursing support to the remote sites. The ultrasounds are attended by an MFM specialist, who speaks to the patient in real time. Reports are generated and sent to the local provider within 24 hours unless an urgent issue warrants immediate consultation with the local provider. Local providers maintain control in determining follow-up, referrals, and co-management. These locations were strategically selected to reduce travel time for care. More recently, BPN identified a need to include telehealth in a prenatal care clinic located in Stoddard County. RMOMS will fund equipment costs and technician salary, and the clinic will provide the space.

> "She needed an ultrasound and that wasn't available here in Stoddard County. By the time she got transportation, it was going to be a couple of days. Time was of the essence and medically she could not wait two days." – BPN Leadership

Figure III-1: Proposed Telehealth Locations



BPN has faced challenges in the roll-out and acceptance of telehealth. While leveraging USDA funds will augment the reach of RMOMS funds, BPN has faced delays out of the network's control. BPN relies on close communication with an advocate at the agency to keep the project moving. Even procurement within Saint Francis using RMOMS funds has been slow given that telehealth equipment is a capital expense. Local providers have also expressed some concern about being cut out of service delivery by telehealth referrals to providers in other locations. To alleviate this concern, BPN leadership has cited SSM Health's decade-long experience with similar programs in southern Illinois. The SSM Health MFM telehealth program has shown that 65 percent of telehealth participants still receive all their care locally, and over 90 percent deliver at their local hospitals. Finally, while telehealth is becoming more widely accepted in rural areas, some clinicians have demonstrated reservations in accepting ultrasound images from new telehealth locations. They are confident in the quality of the images produced by local staff and may need time to adjust to these new partnerships.

> "Especially if we can get moms doing some of the non-stress tests there because [participants have to] come up weekly. They don't have reliable transportation, or they don't have childcare. It would be much easier for mom to take off from work or find childcare for a couple of hours versus the 4–5 hours it takes to drive up here, be seen, and drive back." – BPN Leadership

BPN achieved early telehealth success with a home blood pressure testing initiative. The Cuff Kit initiative, implemented in the planning year in partnership with the Missouri Maternal Child Learning Action Network (MCLAN) and the Preeclampsia Foundation, provided Cuff Kits to a home visiting agency, the FQHC, and a mental health provider, in addition to MCLAN hospital partners. The BPN effort resulted in one partner distributing Cuff Kits to all pregnant individuals they serve in the Bootheel region. Individuals can take their blood pressure at home with the Cuff Kits and transmit the results to their obstetricians for follow-up, resulting in more frequent monitoring and greater convenience.

Additional Activities

Referral and Resource Platform

BPN has been working in collaboration with network partner BBF to launch the BoRN Platform, a product of Unite Us that serves as an automated referral management system to better connect families, including RMOMS participants, to support services in the Bootheel. When a partner sends a referral through the platform, the receiving agency accepts the referral and then closes the loop by indicating that the client received the services.

BPN considered implementation complexity and long-term maintenance costs when weighing options for this initiative. Several options required extensive time for set-up and project-specific build-outs. Partners ultimately selected the Unite Us platform, which is free to community agencies, has flexible data collection possibilities, and is widely used across the nation, including in Kentucky, Arkansas, Tennessee, Illinois, and areas of Missouri. The Unite Us web-based tool has a short intake form and indicators for referral made, referral completion, and a reason if not completed. It also includes a service directory to help network partners identify additional support services programs in the area. The platform, which will be launched in April 2022, is funded through BBF and the Missouri Foundation for Health, with additional collaboration support from BPN.

Training and Education

BPN's training and education efforts have taken shape after coronavirus disease 2019 (COVID-19)-related delays, especially the network's efforts to help EMS providers and non-delivery hospitals deal with obstetric emergencies. The SSM Health Perinatal Services outreach education team developed a Maternal and Neonatal Emergency Training course to be offered within the Missouri RMOMS sites and other rural areas. The hybrid course provides a virtual didactic curriculum combined with in-person simulations throughout the region. Busy rural providers can take the virtual course at their convenience and own pace and receive continuing education units (CEUs). In-person emergency training simulations will build hands-on experience. The course will be disseminated widely by BPN partners, and leadership expects quick take-up because

providers are anxious to learn how to handle obstetric emergencies. These simulations, which will be conducted by SSM Health and held in local EMS departments, provide an example of how the collaborative spirit of RMOMS can result in concrete benefits for network partners and the communities they serve.

C. Health Equity

Finally, BPN is leveraging existing health equity efforts to reduce racial disparities in maternal health in the region. Bootheel Babies and Families has been working on health equity for over a decade. BPN has leveraged these efforts to create a Health Equity Workgroup and host additional trainings with more partners at the table. Workgroup members have also taken the Intercultural Development Inventory (IDI) to assess levels of cultural competence and work through weaknesses. BPN leadership looks forward to expanding health equity discussions among network partners. Conversations will focus on strategies clinicians can use to make women of color more comfortable coming to their appointments and sharing concerns with providers.

D. Sustainability

While BPN has primarily focused on program implementation, leadership has an eye toward sustainability. The SCC position is the primary long-term expense of the network because telehealth visits are covered by insurance, and home visitation services are funded through other grants. BPN is pursuing sustainability for this position through partnerships with Medicaid and other organizations. BPN aims to demonstrate the value of the SCC in terms of improving maternal health outcomes and reducing costly services.

MO HealthNet, the state Medicaid agency, attends BPN workgroup meetings, and leadership from Medicaid MCOs have also demonstrated interest in participation. In addition, BPN leadership has been actively involved in conversations with the state legislature on the extension of Medicaid coverage up to one year postpartum. Finally, leadership engages with agencies across the state to stay apprised of other opportunities for funding and collaboration.

E. Maternal Health Outcomes in the First Implementation Year

RMOMS partners provided pregnancy-related services to 1,305 individuals in the first implementation year. Of these, 929 delivered babies at Saint Francis and MO Delta. Due to missing data, the evaluation could not reliably determine the number of participants who delivered and reached at least 12 weeks postpartum in the reporting period to calculate postpartum measures.

Table III-2: BPN Maternal/Clinical Population in the First Implementation Year

First Implementation Year Counts
1,305 individuals served by BPN for pregnancy-related care
929 RMOMS participants delivered **943** infants in the reporting period

Notes: Pregnancy losses before 20 weeks of gestation were excluded from these figures and the entire patient-level data analysis. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Almost half of RMOMS participants were under the age of 26, and Black participants made up 21 percent of the population (Table III-3). Only three percent of the population identified as Hispanic. Most were insured through Medicaid (64%), although BPN did not report insurance data on almost a third of participants; these were excluded from the metric. All RMOMS participants resided in RMOMS counties.

Table III-3: Demographic Characteristics of the Maternal/Clinical Population Served by RMOMS Partners in the First Implementation Year (Total Population, n = 1,305)

Characteristic	Count	Percent
Age (years)		
Under 18	21	2%
18–25	548	42%
26–30	396	30%
31–34	197	15%
35 and over	141	11%
Race/ethnicity		
White (non-Hispanic)	975	75%
Black (non-Hispanic)	277	21%
Hispanic (any race)	39	3%
Other or unknown	14	1%
Health insurance status of total population with data reported (n = 939)		
Medicaid	605	64%
Private insurance or other	334	36%
Resides in RMOMS county	1,305	100%

Notes: "Other or unknown" includes RMOMS participants who are Asian, AI/AN, Native Hawaiian or other Pacific Islander, or with unknown race/ethnicity status. These categories were combined due to small sample size. Health insurance status was unknown for a third of RMOMS participants. Percentages are calculated excluding these cases. Age information was missing for two RMOMS participants. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Nearly all RMOMS participants in the delivery population made their first point of contact with an RMOMS partner for prenatal care, with very few entering the network just for delivery (Table III-4). Over a third of deliveries were considered high risk, as defined retrospectively by state birth certificate data. The state's definition captures a range of factors that put women at risk, including education status and previous birth complications.[ii] Only five percent of participants received an MFM consultation and two percent a telehealth visit, which BPN defined as a visit during which a participant at one clinic location connects virtually with a clinician at a separate location.

[ii] High-risk was defined retrospectively using birth certificate data, including: Inadequate prenatal care (less than 50% of expected visits or none); Education status less than 12 years or no GED; Gestation of less than 37 weeks; Previous complicated pregnancies; Number of previous fetal deaths; Prior live births of 4 or more; Weight changes/over or under weight gain; and Overweight/underweight for height.

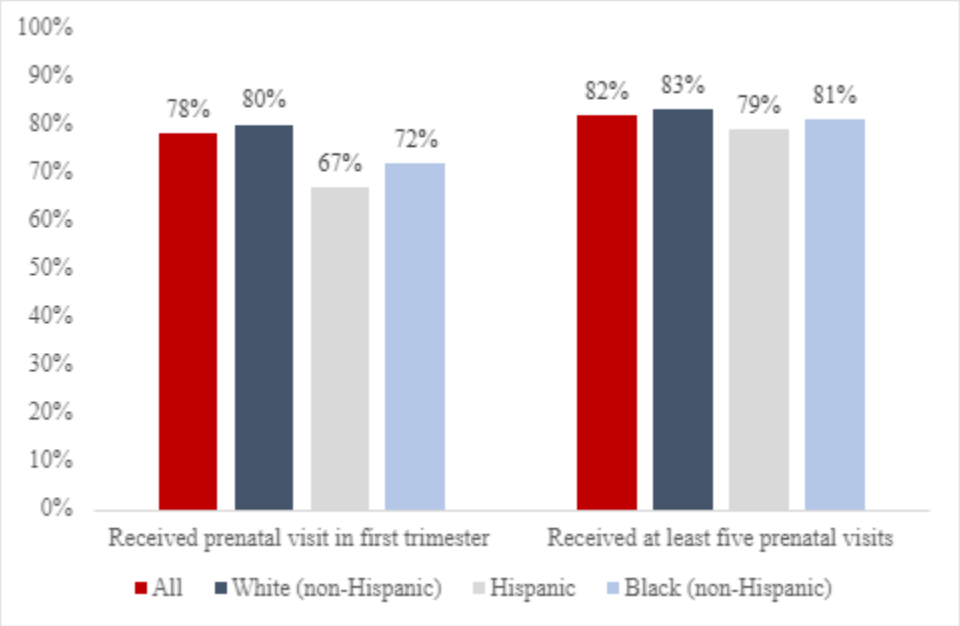
Table III-4: Characteristics of Maternal/Clinical Population Served by RMOMS Partners in the First Implementation Year (Delivery Population, n = 929)

Characteristic	Count	Percent
High-risk pregnancy	325	35%
First point of contact with RMOMS is for prenatal care	910	98%
Received MFM consultation	50	5%
Received one or more telehealth visits	17	2%

Notes: High-risk pregnancy is determined by the prenatal care provider and may be due to medical, obstetric, behavioral health, or genetic problems identified during pregnancy. However, BPN used an alternate definition for evaluation reporting (see page footnote). Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Seventy-eight percent of RMOMS participants who delivered in the reporting period were reported as having a prenatal visit in the first trimester (Figure III-2). The percentages of Black and Hispanic participants who received a prenatal visit in the first trimester were lower than the rate of their white counterparts (72% and 67% compared to 80%). Eighty-two percent of participants were reported as receiving at least five prenatal visits, and the rates did not differ substantially by racial/ethnic group. Nine percent of participants were missing data; while these participants may have received some prenatal care, they are not counted as having received services in Figure III-2.

Figure III-2: Prenatal Care Utilization by Race/Ethnicity in the First Implementation Year (Delivery Population, n = 929)



Notes: The total population includes RMOMS participants who delivered in the reporting period and had race/ethnicity reported. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Almost a fifth of participants who delivered babies in the first implementation year were reported as delivering by Cesarean section (C-section), an improvement over the U.S. rate of 26 percent and the Healthy People 2030 target of 23.6 percent for low-risk pregnancies (Table III-5).[2] Less than 10 percent of participants were required to stay in the hospital for more than three days after

delivery; five percent experienced severe maternal morbidity (SMM), defined as receiving a blood transfusion during delivery, an intensive care unit (ICU) admission during delivery, or a hospital readmission within two weeks of delivery. While rates vary slightly by racial/ethnic group, these differences should be interpreted with caution due to small sample sizes.

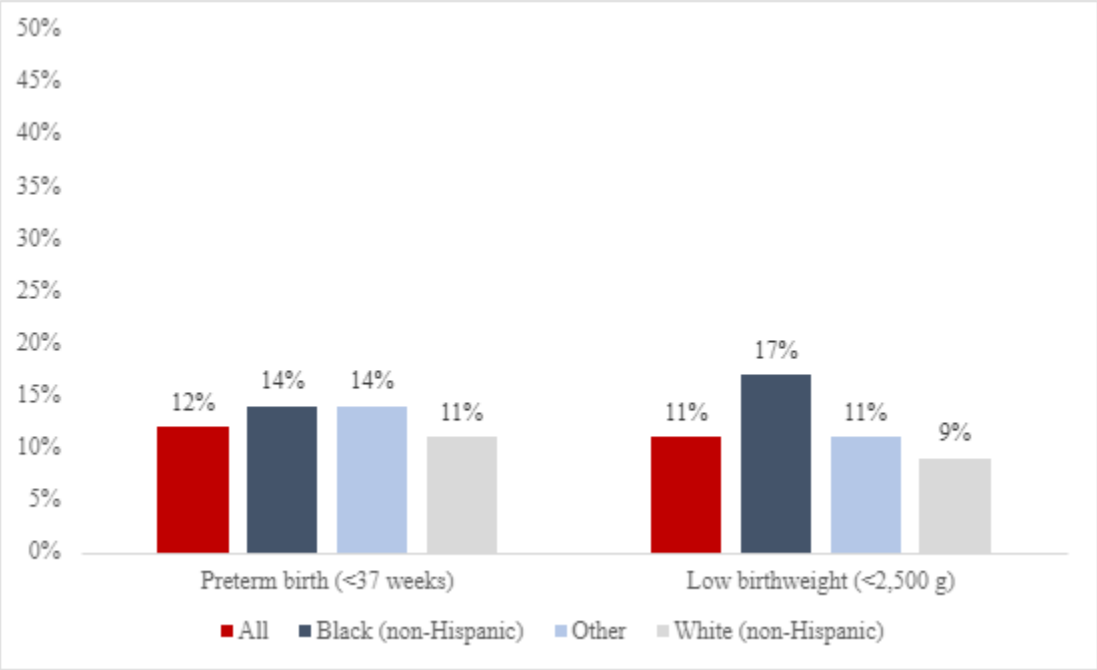
Table III-5: Delivery Care Utilization and Outcomes in the First Implementation Year (Delivery Population, n = 929)

Measure	All	Black	White	Other
C-section delivery	19%	17%	20%	24%
Hospital stay of more than three days	8%	6%	8%	6%
Experienced SMM	5%	6%	4%	7%

Notes: "Other" includes RMOMS participants who are Hispanic, Asian, Native Hawaiian or other Pacific Islander, or with unknown race/ethnicity status. These categories were combined due to small sample size. Caution should be used when interpreting SMM rates by race due to small sample size. SMM is defined as one or more of the following: blood transfusion during delivery, ICU admission during delivery, or hospital readmission within two weeks of delivery. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Twelve percent of infants were born prematurely and 11 percent experienced low birthweight (Figure III-3). Preterm birth rates were higher for Black RMOMS participants and those with other or non-reported race/ethnicity. Infants born to Black participants were also more likely to have low birthweight (17% compared to 11% overall and 9% for white participants). About three percent of babies were admitted to the neonatal intensive care unit (NICU).

Figure III-3: Infant Health Outcomes in the First Implementation Year (Infant Population, n = 943)



Notes: "Other" includes RMOMS participants who are Hispanic, Asian, Native Hawaiian or other Pacific Islander, or with unknown race/ethnicity status. Preterm birth is before 37 weeks of gestation. Low birthweight is less than 2,500 grams. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

BPN reported that 751 RMOMS participants were at least 12 weeks postpartum and received a postpartum visit (Table III-6). Fewer participants were reported as being offered contraception, lactation consultation, or postpartum depression screening after delivery. Information on postpartum care utilization was missing for the remaining participants.

Table III-6: Postpartum Care Utilization in the First Implementation Year

Characteristic	Count
Received postpartum visit within 12 weeks of delivery	751
Documented that participant was offered effective contraception after delivery	328
Documented that participant received postpartum depression screening	464
Documented that participant was offered meeting with lactation consultant after delivery	279

Notes: Due to missing data, the evaluation could not reliably determine the number of participants who delivered and reached at least 12 weeks postpartum in the reporting period to calculate postpartum measures. Therefore, this table only includes counts. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Patient-level data reporting placed a large burden on the network and participating partners. BPN primarily relied on electronic health record (EHR) data from the two major hospital systems (Saint Francis and MO Delta) for patient-level data reporting in the first implementation year. Automated data extraction was often not feasible for critical data elements, requiring staff to manually abstract data from medical records – a time-consuming process. BPN supplemented EHR data with birth certificate data provided by the Missouri Department of Health, reflecting a long-standing arrangement between the state and Bootheel Babies and Families. However, data sharing processes experienced delays due to COVID-19, data management system issues, and staff turnover. As a result of these challenges, some of these measures, such as data on telehealth visits, MFM services, postpartum depression screening, contraception, and lactation consultation, may not accurately represent true service delivery.

IV. Rural Obstetric and Maternal Services Program (ROAMS) (New Mexico)

The ROAMS network in northeastern New Mexico serves the largest geographic area but the smallest total population of the three awardees. The network spans Taos, Union, Colfax, Mora, and Harding counties and offers maternal health care and support services across the continuum of care. Unlike BPN or TX-RMOMS, all three of the ROAMS network hospitals are Critical Access Hospitals (CAHs), a designation reflecting their rural status and limited number of acute care beds (no more than 25).[70] ROAMS made the most progress of the three awardees on its maternal health strategies during the first implementation year and succeeded in submitting high-quality patient-level data for the whole maternal/clinical population. This chapter describes the ROAMS network's early success in expanding prenatal care and telehealth services, promoting use of social supports in the community, and pursuing long-term sustainability with the state Medicaid agency.

A. ROAMS Network Characteristics

The ROAMS network has a robust system of network partners operating out of the three most populous counties (Taos, Union, and Colfax), with outreach and engagement to women living in Mora and Harding counties, two of the most remote and underserved counties in New Mexico.

Network Partners and Collaboration

The network's lead agency, Holy Cross Medical Center in Taos, oversees the network and enacts strategic decisions in collaboration with the Governing Council, which consists of leadership staff from the network clinical partners. The ROAMS network includes formal clinical and support services partners as well as external technical partners that support telehealth and patient navigation activities (Table IV-1).

Table IV-1: ROAMS Network Partners

Network Partner	Network Role	Continuing	Left Network
Holy Cross Medical Center	Delivery hospital and prenatal clinic (Women's Health Institute)	Awardee Lead	
Miners Colfax Medical Center	Delivery hospital and prenatal clinic	●	
Union County General Hospital	Non-delivery hospital and prenatal clinic (Rural Health Clinic)	●	
Presbyterian Medical Services Questa Health Center	Federally Qualified Health Center (FQHC) and prenatal clinic (Rural Health Clinic)	●	
Taos First Steps	Home visiting agency	●	
Youth Empowerment Services	Home visiting agency	●	
Taos Center for Breastfeeding	Lactation consultation	●	
Krossroads	Behavioral health agency	●	
Centennial Care	State Medicaid agency	●	

Network Partner	Network Role	Continuing	Left Network
University of New Mexico	Data and evaluation support	●	
The Children's Workshop	Early intervention services		●
External Technical Partners			
Twistle	Home telehealth vendor	●	
Pathways Community HUB Institute	Patient navigation program	●	
Pinon Perinatal	Telehealth maternal–fetal medicine (MFM) provider	● (new)	

Pinon Perinatal, the network's telehealth MFM provider, is expected to formally join the network during the second implementation year (September 1, 2021 to August 31, 2022). One support services partner, The Children's Workshop, left the network because the organization's director retired and the organization has struggled to find a replacement. The board of directors did not wish to extend the ROAMS partnership during the transition period without adequate staffing to follow through on the commitment. ROAMS hopes to re-engage this partner, which serves a very remote area near Clayton, when the organization secures a new executive director.

Beyond the partners shown in the table, ROAMS also attempted to expand the network to include an FQHC and a local Head Start program in one of the region's remote counties. The FQHC would have served as an expansion site for the ROAMS telehealth and MFM telehealth initiatives and would have introduced basic obstetric care at the site, which only provides primary care services. However, staffing shortages and coronavirus disease 2019 (COVID-19) barriers hindered negotiations with both potential partners. ROAMS leadership reported that staff at both sites were overwhelmed and unable to direct resources to enter new partnerships.

Governance and Collaboration

ROAMS has established a robust governance structure and collaboration framework between partner organizations and between provider types. Hospital executives and other leadership-level members from each ROAMS network site participate on the Governing Council, an overarching body that meets monthly to provide strategic guidance and direction for ROAMS network activities. The ROAMS network also has three official workgroups that meet regularly: the Clinical Workgroup, the Data and IT Workgroup, and the Postpartum Care Legislation Workgroup. At the provider level, there are regular meetings with home telehealth providers, lactation consultants, and family navigators, as well as telehealth "Grand Rounds" for clinicians and family navigators and continuum of care meetings with social service partners. An active Mothers' Advisory Council holds an approximately biannual meeting to solicit feedback from local women on their priority needs and preferences for new maternal health care services in the community. ROAMS also supports collaboration and skills development with ad hoc training and educational opportunities for implementation staff, including Community Health Worker (CHW) certification for the family navigators, network-wide health equity training, a maternal mental health symposium, and COVID-19 and pregnancy training.

Most interviewees said that network partners collaborate well as a single functional network. A member of the ROAMS leadership team reported that the network's combination of Governing Council "big picture oversight" paired with "tactical hands-on" work from the workgroups has been very effective. Overall, well-established preexisting relationships between some network sites and the recognized need for new services in the community have facilitated the ROAMS collaboration. The engagement of clinicians is more mixed. Some interviewees noted that some clinical providers have a lower level of engagement and interest in ROAMS initiatives than others, while other clinical providers did not have an opportunity to provide strategic input into the ROAMS network strategies during the planning phases.

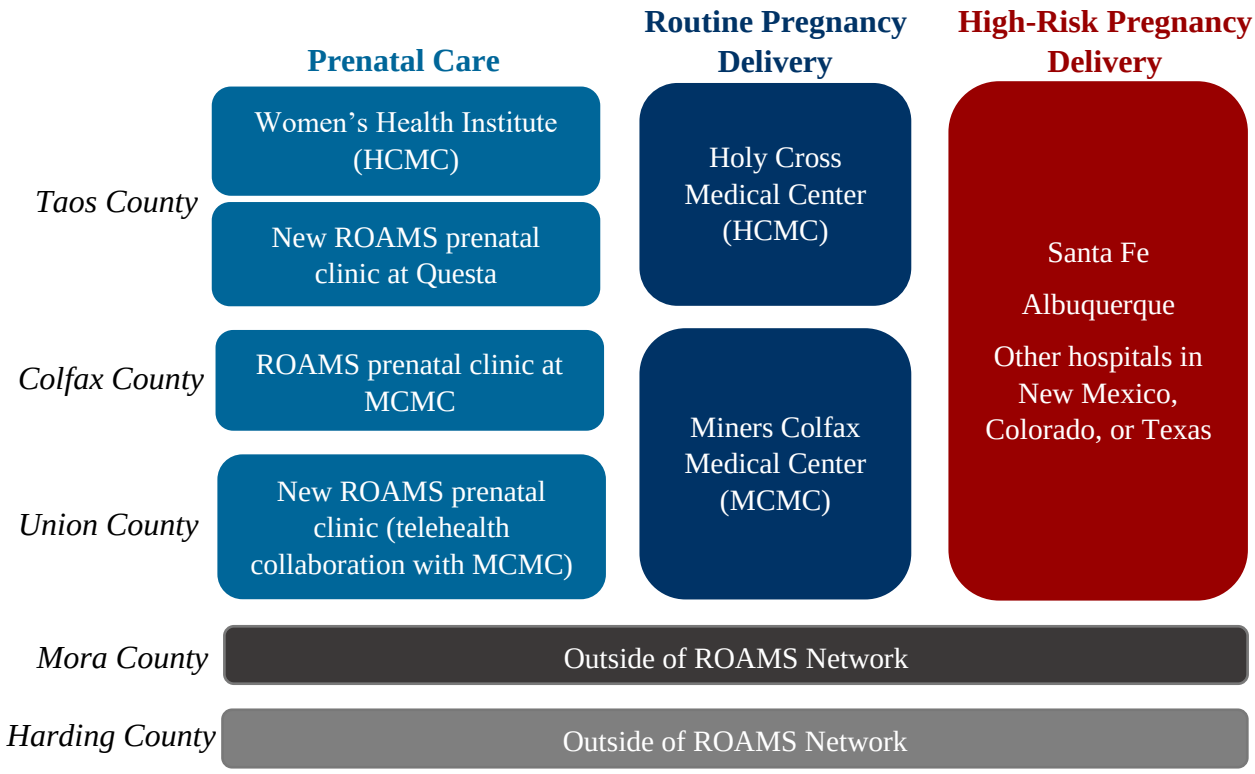
> "Rather than being this silo, only seeing the world the way we've always done things, we're now looking at things differently and thinking regionally. So that rather than expecting patients to drive down from Questa, we're actually going up to them…we have a lot of potential to actually grow and improve." – ROAMS Leadership

Certain clinical partners have approached ROAMS somewhat cautiously, especially because ROAMS has introduced completely new and unfamiliar initiatives, such as home telehealth kits. When clinical partners lack expertise in these new areas, it can introduce hesitancy or concerns about possible liability. The leadership team also oversees customized negotiations with participating hospitals, especially in cases where partners perceive downsides or financial losses associated with ROAMS program initiatives and participation.

Patient Flow and Network Capacity for High-Risk Care

The nature of the collaborations within the ROAMS network stems in part from the network's structure and service areas (Figure IV-1). In effect, the two delivery hospitals within the network, Holy Cross Medical Center in Taos and Miners Colfax Medical Center in Raton, serve as two "branches" of the network. Holy Cross Medical Center, the lead agency in Taos, mostly serves local patients, whereas Miners Colfax Medical Center in Raton serves patients from Union and Colfax counties and occasional patients from Harding and Mora Counties. Both hospitals are CAHs; a third hospital in the network, Union County General Hospital, is also a CAH, but does not offer labor and delivery services. Both Holy Cross Medical Center and Miners Colfax Medical Center have on-site prenatal clinics, and both maintain additional prenatal/telehealth partnerships with other sites within the ROAMS network. Mora and Harding, both remote and sparsely populated counties, have far less access to ROAMS prenatal and delivery services, but ROAMS identified the two counties as ideal candidates for non-clinical outreach, patient navigation support, and possible future expansion of prenatal services.

Figure IV-1: ROAMS Patient Flow



Note: Mora County and Harding County have new access to ROAMS family navigator and lactation consultation services, but there are no new ROAMS prenatal clinics or delivery hospitals in either county.

None of the three CAHs anchoring the ROAMS network have a neonatal intensive care unit (NICU) or MFM department. Women with high-risk pregnancies who receive prenatal care within the network often deliver in Santa Fe, Albuquerque, or at hospitals in Colorado or Texas, none of which have data-sharing agreements with the ROAMS network. A ROAMS clinical provider estimated that about two-thirds of the clinic's patient population qualifies as "relatively high-risk MFM-level patients" and reports that the region has "more high-risk patients than any other place I have worked." Many patients have hypertension, diabetes, or other chronic health problems. Others reported that "no-shows" to prenatal appointments represent a major challenge in the community, particularly for younger mothers, women with substance use disorder (SUD), and women with significant transportation barriers. Regional poverty also has a strong negative impact on wellness, nutrition, and transportation access during pregnancy.

The two delivery hospitals, Holy Cross Medical Center and Miners Colfax Medical Center, do not compete for patients and do not refer patients to each other for clinical services. Rather, they collaborate on shared initiatives that fill gaps in care that neither can provide (e.g., telehealth MFM care). The ROAMS providers lack the capacity to oversee many types of high-risk deliveries within the network. However, some individuals with high-risk pregnancies, such as older women with no other clinical risk factors or women with well-controlled diabetes, can safely deliver at ROAMS network facilities. Others with high-risk pregnancies sometimes choose to deliver locally to avoid long drive times or because of caregiving responsibilities at home. Most of ROAMS' network strategies focus on utilizing telehealth to increase access to

prenatal care for both routine and high-risk pregnancies, which can expand access to local care during pregnancy, even if delivery ultimately takes place outside of the network. The prenatal care stage of the maternal health continuum of care represents the area of greatest focus and possible impact for the ROAMS network.

Community Challenges in ROAMS Counties

ROAMS interviewees consistently identified transportation and care access barriers as top access and equity concerns for the community, especially in the most remote counties. Harding County, the least populous county in New Mexico, has just 657 residents over 2,000 square miles compared to 34,489 residents over the same approximate area in Taos County.[71] These remote counties have less access to both in-person clinical services and telehealth readiness. Taos County has local access to labor and delivery services and higher rates of broadband subscriptions than Harding County.[71] Union County, which has a new ROAMS prenatal clinic but not a delivery hospital, also has lower rates of broadband coverage than Taos County.[71] The ROAMS counties have higher rates of Medicaid-covered births than the state average. While 54 percent of births statewide have Medicaid coverage at delivery, the rate reaches approximately 75 percent in a typical year for the five ROAMS counties combined.[58]

> "What we're hearing about pregnant moms nationally is only a third are vaccinated…when I talk to the doctors, they say 'yeah, a lot of our moms are not getting it. And no matter what I tell them, they're still not getting it.'" – ROAMS Leadership

Network providers also report that COVID-19 vaccination during pregnancy remains low, despite provider efforts to educate and promote timely vaccination in accordance with national guidelines. Changing national guidelines about vaccination during pregnancy and employer vaccine mandates have contributed to hesitation and mistrust in some communities among both patients and clinicians who provide maternal health care.

B. Network Model and Goals

In its baseline planning period, the ROAMS network identified three primary goals: expand access to care, connect women to social services, and achieve financial sustainability. The network made strong progress on most of its maternal health strategies during the first implementation year. This section discusses major activities, changes, successes, and challenges for each of these goals and strategies during the first implementation year (September 1, 2020 to August 31, 2021).

Expand Access to Care

The ROAMS network invested significant time and resources into its top goal, improving access to prenatal care, in acknowledgment of the major access barriers facing its remote, geographically dispersed population. The four primary strategies are described below.

Open New Prenatal Clinics, Implement Staffing Partnerships, and Modernize Equipment

The ROAMS network opened two new prenatal clinics during the first implementation year, one in Questa (Taos County) and one in Clayton (Union County). The Questa clinic operates from an FQHC that previously did not offer any prenatal care, while the Clayton clinic operates from

Union County General Hospital, a CAH that did not offer any obstetric services prior to the new partnership with the ROAMS network.

Each new prenatal clinic established a partnership with another ROAMS network provider to provide care. Questa partners with the prenatal clinic (Women's Health Institute) at Holy Cross Medical Center 30 miles away and hosts a Holy Cross provider for in-person prenatal appointments each month. The shorter distance between the two sites enables in-person visits rather than telehealth visits, which also aligns with provider preferences. The Questa Health Clinic offers important wraparound services to patients, including dental and behavioral health care, and serves patients regardless of their ability to pay, making it an ideal site to host the ROAMS clinic.

The Union County General Hospital Clinic in Clayton partners with Miners Colfax Medical Center, about 80 miles away, and uses a telehealth-only model. The ROAMS Medical Director, a family physician with obstetrics (FP/OB) located at Miners Colfax Medical Center, serves as the primary obstetrics provider for the Clayton site. He and one other obstetrics provider at Miners Colfax work closely with Clayton's on-site nurse practitioner to coordinate patient visits every other Wednesday. The patients travel to the Clayton clinic, receive an in-person evaluation from the nurse practitioner, and then join a telehealth session with the FP/OB at Miners Colfax to complete the visit.

The model has worked well so far, although the providers noted that there have been some minor roadblocks related to scheduling and coordination, particularly on the Clayton side. Clayton noted that "clearing the Wednesday schedule" to coordinate obstetrics appointments with Miners Colfax has put downward pressure on revenue. Approximately 14 patients attended their regular obstetrics appointments at Clayton in the first six months of the model's launch, but Clayton would normally see 10 non-obstetrics patients in a single Wednesday afternoon. This downside stands in contrast to the perceived impact of the ROAMS model, which Clayton identified as "excellent" and an essential source of care for "women who would never have gotten care at all."

> "It's not all good news. [For] ROAMS, we meet every other Wednesday with the FP or the OB/GYN, but we're dealing with our patients every single day of the week. I have let loose of my Wednesday schedule to see just these OB patients. Therefore, I hear every day how much revenue we're losing because of that." – ROAMS Clinician

Finally, ROAMS invested in modernized, telehealth-ready equipment for all four prenatal clinics in the network. The equipment includes new ultrasound machines, medical supplies for prenatal visits, and telehealth technology to facilitate standardized, modern infrastructure across all four network sites.

Home Telehealth Kits and Educational Offerings

The ROAMS network has launched a home telehealth initiative through Twistle, a company offering home telehealth kits and educational videos about different milestones in pregnancy. The kits provide RMOMS participants with blood pressure cuffs, fetal monitors, and other pregnancy-related equipment to help them monitor selected vital signs at home, while the educational videos explain what to expect at different stages of pregnancy. The ROAMS

clinicians and providers, including the new Questa clinic, work together to distribute the kits (discussed in more detail under Goal/Strategy 2: Connect Women to Social Services).

Telehealth MFM

The ROAMS telehealth MFM provider initiative strategy remains the only major strategy facing significant implementation delays, but ROAMS still views it as a centerpiece of the network's goal to expand care to women with high-risk pregnancies, all of whom face long drive times and sometimes unpaid time off work to access high-risk care in Santa Fe or Albuquerque. ROAMS decided to pursue this strategy after receiving feedback from local mothers via a survey and the Mothers' Advisory Council during the planning year. The feedback identified greater access to high-risk pregnancy care as the top priority for many local mothers. ROAMS therefore decided to contract with a telehealth MFM provider that could collaborate with each clinical site in the ROAMS network to connect patients to telehealth prenatal visits. Many individuals with high-risk pregnancies will still travel to tertiary centers outside of the network for delivery, but the telehealth MFM initiative will enable them to receive the vast majority of their prenatal care visits closer to home.

> "…That took way too long getting the docs to actually agree [on the MFM provider]…but in hindsight, recognizing that it's not just our medical staff but the equivalent of four different medical staffs that we're trying to get the buy-in – maybe I was unrealistic as far as the timeline." – ROAMS Leadership

While ROAMS planned to launch the telehealth MFM initiative in the spring of 2021 (during the first implementation year), contractual barriers and extensive negotiations with the participating clinical partners delayed implementation. The negotiations included joint decision-making about which telehealth MFM provider to contract, appropriate equipment, and structural planning for remote ultrasound reads and telehealth MFM visits, but the ROAMS network providers all have different preexisting contracts and preferences, which delayed consensus. ROAMS also encountered supply chain shortage problems that delayed the delivery of the agreed-upon ultrasound machines. Implementing the strategy remains a top priority for the second implementation year.

Summary of ROAMS Telehealth Care

- Telehealth MFM (not yet started) with upgraded equipment
- Telehealth prenatal care program with upgraded equipment
- Home telehealth kits and videos for patients

Connect Women to Social Services

The ROAMS network identified three primary strategies to connect women to social services in the planning year: offer patient navigation services, hire lactation consultants, and develop advertising campaigns to promote support services and births in ROAMS facilities.

Patient/Family Navigation

The ROAMS network has a major focus on patient navigation and aims to serve at least 50% of RMOMS participants with patient navigation services, especially during pregnancy. The network's patient navigation strategy has two integrated components:

> "[ROAMS] is excellent. It provides care to women who would never have gotten care at all, prenatal care. And then the care continues. It starts at childbearing age and ends at the end of childbearing age. We have family navigators, we have so many things that impact the lives of these women." – ROAMS Clinician

- **Network family navigators provide care to patients.** The ROAMS network hired two family navigators during the first implementation year, one serving Taos, Mora, and Harding counties and one serving Colfax and Union counties. Each family navigator works approximately 32 hours per week and has completed a CHW certification program through the University of New Mexico branch in Taos. The prenatal clinic in Questa also has a family navigator on staff who supports the ROAMS family navigator initiative, including completing CHW training and attending family navigator network meetings, but her caseload has historically focused on patients with behavioral health diagnoses and is far smaller than the ROAMS navigators' caseloads. The ROAMS network deliberately recruited navigators with lived experience in the communities they serve and plans to hire a third family navigator in the second implementation year to serve more patients in Taos, Mora, and Harding counties.
- **Family navigators implement the Pathways Community HUB Institute (PCHI) program**, an external care model and patient navigation program with structured clinical pathways, targets, and possible opportunities for future Medicaid reimbursement. The navigators, including the navigator employed by the Questa clinic, can enroll RMOMS participants in relevant "pathways" for prenatal and postpartum care, including specialized pathways for hypertension, diabetes, and other chronic conditions during pregnancy. The ROAMS network joined Pathways as a pilot program and is in the process of becoming a certified agency, which will enable greater financial sustainability in the future. ROAMS opted for this structured program to ensure the future sustainability of its patient navigation efforts and to improve patient care.

The navigators work out of the prenatal clinics, the most common site for receipt of care, and proactively reach out to RMOMS participants to offer the navigation services while they are in the clinic. Future visits often take place in the home or at other locations in the community, which aligns with the PCHI Pathways program's focus on encouraging family navigation in community-based settings.

> "I've had a mom who just broke down in tears and cried…from the breastfeeding support, the breast pump support, and just having someone there…she has done the pregnancy all by herself and she's one of the moms who called me every single week and our visits last a whole hour, every single time." – ROAMS Family Navigator

The family navigators have several key responsibilities:

- **Handle referrals and connections to local resources using a "warm hand-off" approach.** These services include transportation, food assistance, home visits,

Medicaid, behavioral health referrals, lactation consultation, and individualized attention and support for clinical care needs, especially during pregnancy and postpartum. Appointments can take place in person at the clinic or over Zoom, offering flexibility to patients. The family navigators also connect RMOMS participants to a texting program called TigerConnect, which allows them to exchange secure messages with the family navigator.

- **Distribute and promote the ROAMS Twistle home telehealth kits.** The family navigators also help women learn how to use the new ROAMS home telehealth kits, which network clinicians can prescribe during pregnancy. The Twistle kits include fetal monitors, blood pressure cuffs, pulse oximeters, glucometers, a weighing scale, and access to virtual educational content about the different stages of pregnancy and high-risk pregnancy conditions.
- **Guide RMOMS participants through the PCHI Pathways program in close collaboration with clinicians.** The family navigator and the clinical provider collaborate to guide the RMOMS participant to the correct PCHI pathway and find appropriate resources depending on her needs. Family navigators meet with their affiliated clinician once a month for case review and attend check-ins with the ROAMS Project Director every other week.

> "The clinics just love [the family navigators]. The patients just love them. So that has been huge. I mean, I think everyone anticipated that this would be well-received, but the degree to which we're getting positive feedback…that level of connection, that level of service [didn't exist] before...." – ROAMS Leadership

The two primary family navigators had each enrolled between 30–40 women in the patient navigation program by the end of the first implementation year. A very small number of patients also received patient navigation services from the health clinic in Questa.

The ROAMS leadership team has high expectations for the PCHI Pathways program because it helps address major unmet needs in the community, particularly the lack of access to adequate transportation and lactation consultation services, while also offering a greater chance of long-term financial sustainability after the RMOMS funding ends. However, some interviewees reported differing levels of clinician engagement with the other ROAMS telehealth initiatives, especially the Twistle home telehealth kits. Fewer home telehealth kits have been distributed in Taos County than in Union County, reflecting the role of provider and local preferences in utilizing at-home telehealth technology rather than local need. The network plans to work closely with the family navigators to promote ongoing usage of the telehealth kits in all counties.

Lactation Consultation

The ROAMS network also committed to increasing access to lactation consultation services and responding to unmet need in the community. It established a program goal to provide lactation consultation services to at least 50 percent (adjusted from a previous goal of 75%) of mothers who receive clinical services from network facilities. The network intended to hire two lactation consultants during the planning and first implementation years, but only hired one by the end of the first implementation year due to challenges in securing a Raton-area consultant to offer

lactation consultation services on top of her other full-time job responsibilities. However, ROAMS reported that a staff member at one of the ROAMS support services agencies (Youth Empowerment Services) received Certified Lactation Counselor training through ROAMS and provided some lactation consultation services as part of her home visitation rounds, therefore providing at least some care in the Raton area. Interviewees generally reported difficulties in hiring and staffing specialized positions, especially in the most remote areas, but the network reported planning to hire two new certified lactation consultants during the second implementation year.

The ROAMS lactation consultant has an International Board of Lactation Consultation Examiners (IBLCE) credential and a long history of working with one of the ROAMS network facilities. The ROAMS network specifically wrote lactation consultation into its RMOMS program application to obtain greater funding and support, responding to the known challenge of patients' inability to pay and the lack of Medicaid reimbursement for the service.

RMOMS participants obtain referrals for lactation consultation through the Women's Health Institute (the prenatal clinic at Holy Cross Medical Center), through a local pediatric practice, through the Taos First Steps Home Visiting Program, and from the ROAMS family navigator, demonstrating a high degree of integration within the ROAMS network structure. Visits last between 90 minutes and two hours and can include history, assessment, observation, and planning to help make breastfeeding successful. During the first implementation year, the ROAMS lactation consultant served 82 individuals, a nearly 200 percent increase over the number served during the ROAMS planning year.

> "Now it's fantastic…I can talk to people. I can tell them about the ROAMS [funding] and that their [lactation consultation] visits are going to be no charge to them, no matter how many visits they have…the increase in women getting services has been astronomical." – ROAMS Network Partner

Advertising, Marketing Support, and Local Engagement

ROAMS provides marketing and advertising support to network partners, especially support services partners. The network built on this activity during the first implementation year and identified a greater need for preconception services and initiatives to prevent teen pregnancy. The network began supporting a local initiative that offers a text message support line for both youth and adults with questions about sexual and reproductive health. This program, In Case You Are Curious (ICYC), will collaborate with ROAMS on an advertising initiative to help ROAMS collect data on specific advertising keywords in the five RMOMS counties. ROAMS plans to launch advertising in English and Spanish to reach youth and adults in the region. The network planned the collaboration in the first implementation year and expects it to go live during the second implementation year (September 1, 2021 to August 31, 2022).

ROAMS also promotes active engagement with local mothers and uses their feedback to guide the network's strategic initiatives. The network's Mothers' Advisory Council, which initially met during the planning year, met again during the first implementation year. Twelve pregnant RMOMS participants in the Taos area attended the meeting and collectively identified the need

for additional support in the postpartum period, particularly social support and educational resources. The network therefore established a new "Postpartum Series" of educational meetings covering selected topics in postpartum health and wellness that will take place throughout the second implementation year. The ROAMS family navigators and lactation consultant will also attend each session (in addition to the session leaders) to provide additional support and resources to attendees.

Achieve Financial and Network Sustainability

Finally, ROAMS has a strong focus on financial and network sustainability. Beyond contracting with the PCHI Pathways patient navigation program (discussed previously), the network conducts ongoing market loss analysis for the two delivery hospitals, Holy Cross Medical Center and Miners Colfax Medical Center, to learn more about why some RMOMS participants seek delivery care outside of the network after receiving prenatal care from RMOMS providers. While the network sees unavoidable market loss of women with high-risk pregnancies, who typically deliver at higher-level facilities elsewhere in New Mexico, ROAMS seeks to understand why women with normal-risk pregnancies sometimes deliver outside of the network, resulting in reduced revenue for ROAMS delivery hospitals.

The network paired internal financial data with survey and Mothers' Advisory Council data from 51 women during the first implementation year, primarily in the Taos area, to learn more about why market loss occurs. Taos area RMOMS participants revealed that local women want more local access to high-risk pregnancy care and integrated, coordinated care across the continuum from pregnancy to postpartum. ROAMS plans to expand these successful data collection initiatives to Colfax County, home of the network's other delivery hospital, in future years.

> "There are no specialists here in Taos, so some moms choose to go out of Taos and just stick with one specialized provider instead of bouncing back and forth." – Feedback from an RMOMS Participant in Taos

Interviewees reported that physicians have been surprised and concerned to see financial loss data demonstrating that many women who could have remained in-network for delivery have chosen to deliver at non-ROAMS providers. ROAMS also pairs financial loss data with findings from the RMOM program evaluation's patient-level data to show rates for delays in timely prenatal care or follow-up visits, which may help highlight areas for improvement and possible avenues for retaining more births within the network.

The ROAMS network also has specific strategies to promote long-term changes to Centennial Care, the state Medicaid program (discussed in the Sustainability section).

C. Health Equity Strategies

The RMOMS model promotes attention to health disparities and achieving health equity with a focus on delivering creative prenatal care solutions to RMOMS participants living in its remote, mountainous area. The network serves a majority-Hispanic population, a smaller American Indian/Alaska Native (AI/AN) population (approximately 5%), and a majority-Medicaid population (approximately 75%). Most of the ROAMS maternal health strategies specifically address rural- and transportation-related health equity challenges. The PCHI Pathways patient navigation program also has built-in standards related to health equity topics, including requirements for culturally and linguistically appropriate services. However, several RMOMS interviewees reported that the network's maternal health strategies address health equity challenges for the region as a whole, rather than for individual groups living within the area.

> "I wouldn't say that there's a specific population that is harder to serve…it's more our area and the lack of resources in our area that everybody does not have access to." – ROAMS Family Navigator

The ROAMS network's greatest health equity focus to date has emerged in its network-wide policies and strategies and in its engagement of local voices to inform network policy. ROAMS incorporated a strong health equity focus into network hiring and staffing practices, especially for the family navigator positions. The job listings for the three family navigator positions explicitly asked for shared lived experience in the communities the ROAMS network serves. Moreover, network leadership reached out to network partners to promote the hiring of trusted individuals who will work well with community partners.

While the part-time (32 hours per week) navigators had initially been hired as contractors to facilitate fast onboarding, ROAMS later hired them as employees of Holy Cross Medical Center in Taos County, even though one of the navigators serves Union and Colfax counties only. The ROAMS clinical partners in Union and Colfax counties did not feel comfortable hiring a permanent family navigator that they would not be able to retain permanently after RMOMS funding ends, but ROAMS overcame this challenge by hiring all family navigators as Holy Cross Medical Center employees, regardless of their physical location. The network also offered a strong living wage to promote retention in a traditionally underpaid field and invested in CHW certification training for all family navigators to develop their skills and education. Beyond this specialized training, ROAMS requires standardized health equity training for all new hires, and some staff have attended training on other health equity subjects, such as recognizing and countering implicit bias in patient interactions or reducing stigma associated with SUD.

Finally, the ROAMS network maintains a focus on health equity in several patient-facing initiatives, notably the Mothers' Advisory Council and a patient survey series (discussed previously). These initiatives draw on perspectives from local mothers to help shape strategic priorities and provide feedback about patient care at the network hospitals. ROAMS has a strong record of both collecting and immediately implementing these suggestions, which helps ensure that local mothers have a strong voice in the network's strategic direction.

D. Sustainability

Beyond the internal network initiatives to promote sustainability, such as the PCHI Pathways program and hiring family navigators as full-time employees, ROAMS sees the most potential for sustainability gains in the proposed changes to Centennial Care, New Mexico's Medicaid program. The network strives to address specific gaps in pregnancy-related Medicaid reimbursement and coverage statewide. The ROAMS Governing Council and leadership team work directly with the state Medicaid agency and regional partners to promote increased reimbursement in several major areas (Table IV-2).

> "As far as long-term sustainability of OB services, increased reimbursement is an important part of that, and so the work that [ROAMS leadership] has done with [the state Medicaid agency] has the potential to be groundbreaking." – ROAMS Leadership

Table IV-2: The ROAMS Network's Proposed Medicaid Changes

Proposed Change	Rationale	Potential Impact
Increase reimbursement for births	Medicaid reimburses births in New Mexico at lower levels than other states and lower than actual costs	Would improve reimbursement for ROAMS hospitals (75%-plus Medicaid population) and reduce revenue decrease (>$1M per year); would increase reimbursement for all delivery hospitals in New Mexico
Expand postpartum Medicaid coverage to one year	Postpartum coverage terminates at 60 days, threatening access to care and preventive services	Would extend coverage for all postpartum women with Medicaid in New Mexico and improve maternal health outcomes
Increase reimbursement and clinical designation for lactation consultation services	State policy only reimburses lactation consultation at $1.50 per visit as a non-medical "education session," which does not cover costs	Lactation consultation would qualify as a clinical visit with a higher reimbursement rate
Change the Medicaid transportation benefit to apply to pregnancy-related Medicaid	Medicaid transportation reimbursement is only available for non-pregnancy Medicaid ("full Medicaid"), resulting in a gap in coverage for pregnant women with transportation barriers	Would fill the gap in coverage for mothers with pregnancy-related Medicaid eligibility and promote attendance at prenatal care appointments
Obtain long-term telehealth policy and reimbursement guarantees	The telehealth reimbursement infrastructure and environment remains uncertain, especially during COVID-19, and may threaten the sustainability of telehealth initiatives	Would ensure that progress on telehealth prenatal care, home telehealth, and MFM care can outlast the RMOMS funding

Notes: As of April 2022, New Mexico has expanded Medicaid postpartum coverage to 12 months under the American Rescue Plan Act of 2021.

A member of the ROAMS Governing Council also sits on the Medicaid Advisory Committee for the New Mexico Human Services Department (home of the Medicaid agency), which facilitates progress and formal collaboration on these goals. ROAMS successfully presented market loss analysis data to Medicaid and explained how inadequate reimbursement may influence the increase in "obstetric deserts" in rural communities and how reimbursement changes may improve rural maternal health at relatively little cost to the state. The state Medicaid agency has requested more data, resulting in ROAMS feeling optimistic that the agency may enact some or all of the network's proposed initiatives. Patient-facing interviewees also reported their own perceptions that ROAMS network leadership is working "very, very hard to make things sustainable by the end of the award period." ROAMS' future plans include ongoing work with the state Medicaid agency as well as a potential collaboration with the Rural New Mexico Hospital Association. ROAMS hopes to reach out to this association to partner on obtaining more data about financial losses associated with obstetrics care in the state.

> "I think everyone feels that this is one of the most exciting and best projects that's come along in a long time." – ROAMS Leadership

E. Maternal Health Outcomes in the First Implementation Year

The ROAMS program served 463 individuals for pregnancy-related care during the first implementation year, as reported in patient-level data submitted by the network for September 1, 2020 to August 31, 2021. ROAMS served the smallest total population of the three RMOMS awardees. Overall, the network saw 281 deliveries, of which 214 (76%) took place at ROAMS network facilities. Many women with high-risk pregnancies deliver outside of the ROAMS network due to the lack of in-network tertiary care, although these transfers depend on risk severity and patient preference.

Table IV-3: ROAMS Maternal/Clinical Population in the First Implementation Year

First Implementation Year Counts
463 individuals served by ROAMS for pregnancy-related care
281 RMOMS participants delivered **284** infants in the reporting period, with
214 in-network deliveries of **214** infants, and
248 RMOMS participants delivering and reaching at least 12 weeks postpartum in the reporting period.

Notes: Pregnancy losses before 20 weeks of gestation were excluded from these figures and the entire patient-level data analysis. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

The ROAMS network served a fairly young and diverse population in the first implementation year (Table IV-4). Over 60 percent of the total maternal/clinical population was under the age of 30, more than half (57%) of the population identified as Hispanic, and the network also served a significant AI/AN minority population (5%). The delivery population had mostly Medicaid insurance (75%) and private insurance (24%), with a very small other or uninsured population; the share of women with Medicaid insurance was over 20 percentage points higher than the average percentage of Medicaid-covered births in New Mexico in 2020.[58]

Table IV-4: Demographic Characteristics of Maternal/Clinical Population Served by ROAMS Partners in the First Implementation Year (Total Population, n = 463)

Characteristic	Count	Percent
Age (years)		
Under 25	163	35%
26–30	125	27%
31–34	94	20%
35 or older	81	17%
Race/ethnicity		
White (non-Hispanic)	160	35%
Hispanic (any race)	265	57%
AI/AN (non-Hispanic)	25	5%
Other race, more than one race, or unknown	13	3%
Health insurance status		
Medicaid	346	75%
Private insurance	113	24%
Other or uninsured	--	<2%

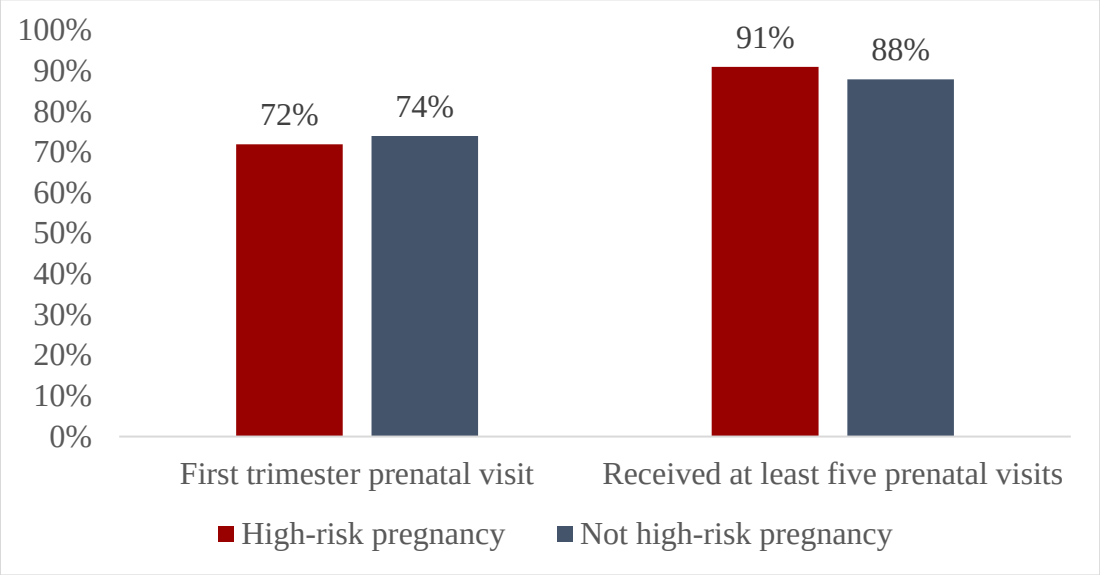
Notes: "Other race or more than one race" includes Asian, Black, Native Hawaiian or other Pacific Islander, more than one race reported, or unknown race reported. These categories were combined due to small sample size. Cell counts are suppressed for figures below 10 (indicated with "--"), and corresponding percentages mask actual cell count. Teen pregnancies could not be reported separately due to small sample size.
Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Prenatal Care and Risk Factors

ROAMS provided prenatal care data on the 281 individuals in the delivery population. Nearly all (96%) first encountered the ROAMS network for prenatal care, and over 90 percent lived in one of the five ROAMS counties. Prenatal care providers identified pregnancies as high-risk or not high-risk during regular prenatal care visits. They flagged 64 percent of the delivery population as having high-risk pregnancies due to medical, obstetric, behavioral health, or genetic problems identified during pregnancy. Less than half (43%) of RMOMS participants with high-risk pregnancies received a consultation with an MFM provider.

Of the 281 women in the delivery population, 72 percent received a prenatal visit in the first trimester, and 88 percent received at least five prenatal visits during their pregnancies. Rates for both measures were similar for high-risk and not high-risk pregnancies (Figure IV-2).

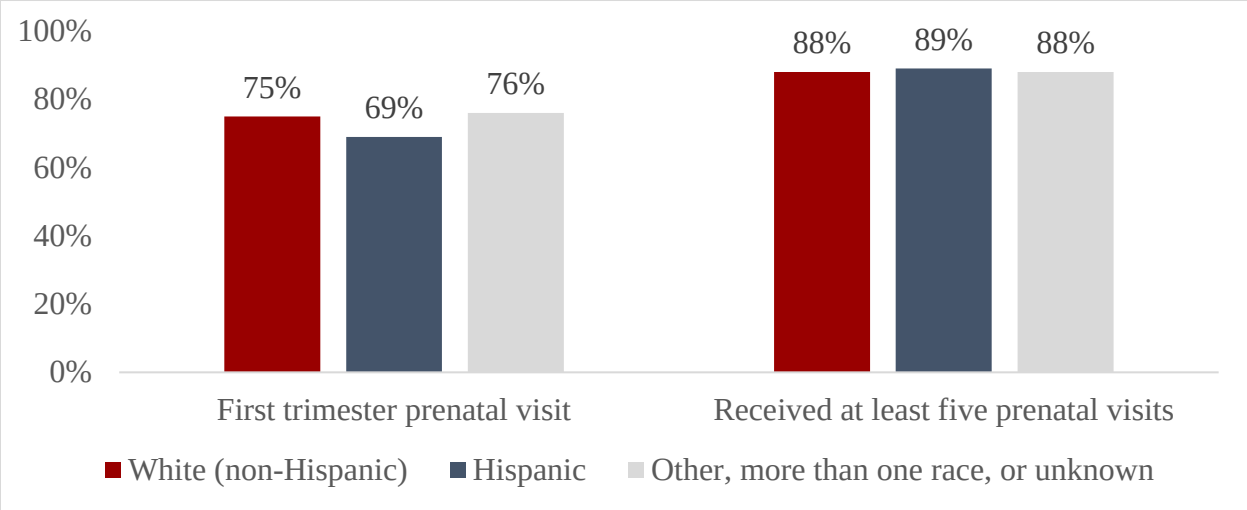
Figure IV-2: Prenatal Care Utilization by High-Risk Pregnancy Status (Delivery Population, n = 281)



Notes: High-risk pregnancy is determined by the prenatal care provider and may be due to medical, obstetric, behavioral health, or genetic problems identified during pregnancy. Source: Patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

The share of RMOMS participants receiving five or more prenatal visits was also consistent across racial/ethnic subgroups (Figure IV-3). However, Hispanic women were somewhat less likely than non-Hispanic women to have a prenatal visit in the first trimester. Rates were highest for the AI/AN population for this measure, although small sample sizes preclude presenting detailed findings on this subgroup.

Figure IV-3: Prenatal Care Utilization by Race/Ethnicity (Delivery Population, n = 281)



Notes: "Other race or more than one race" includes Asian, AI/AN, Black, Native Hawaiian or other Pacific Islander, more than one race reported, or unknown race reported. These categories were combined due to small sample size. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Small shares of RMOMS participants attended one or more visits via telehealth (9% of the total delivery population) in the first implementation year, the first year that ROAMS launched the

telehealth prenatal care partnership between Miners Colfax Medical Center and the prenatal clinic at Union County General Hospital and the second year of the COVID-19 pandemic.

Table IV-5: Prenatal Health Care Utilization in the First Implementation Year (Delivery Population, n = 281)

Measure	All Deliveries (n = 281)	
	Count	Percent
Received first trimester prenatal visit	201	72%
Received one or more telehealth visits	25	9%
Received at least five prenatal visits	248	88%

Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Labor, Delivery, and Postpartum Care

The ROAMS network reported data for infants delivered both within the network and outside of the network, although rates of "unknown" data were higher for out-of-network deliveries. Among infants delivered in-network, seven percent were born preterm and eight percent were low birthweight. Rates of preterm birth and low birthweight could not be displayed for Hispanic or AI/AN infants due to small sample sizes. Greater proportions of out-of-network infants were reported as preterm and low birthweight (26% and 17%, respectively) although a substantial share of the out-of-network births were missing data on infant health outcomes because those delivery locations are not part of the ROAMS network. The number of NICU stays reported for both groups was below the reporting threshold (that is, fewer than 10). Very few infant deaths occurred among either cohort. These findings reflect the higher likelihood of out-of-network births for pregnancies at higher risk for preterm and low birthweight infants.

Table IV-6: Infant Health Outcomes in the First Implementation Year by Delivery Location (Infant Population, n = 284)

Characteristic	Infants Delivered In-Network (n = 214)		Infants Delivered Out-of-Network (n = 70)	
	Count	Percent	Count	Percent
Gestational age				
Preterm birth (<37 weeks)	16	7%	18	26%
Full-term delivery (37+ weeks)	198	93%	39	56%
Unknown gestational age	--	--	13	19%
Birthweight				
Low birthweight (<2,500 g)	17	8%	12	17%
Birthweight not reported	--	<5%	34	49%

Notes: Preterm birth is before 37 weeks of gestation. Low birthweight is less than 2,500 grams. Out-of-network deliveries include non-network hospital deliveries and non-hospital deliveries. Cell counts are suppressed for figures below 10 (indicated with "--"), and corresponding percentages mask actual cell count. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Delivery utilization and outcomes measures can provide insight into the intensity and level of services required during a delivery. Nineteen percent of deliveries took place via Cesarean section (C-section) (Table IV-7). Smaller shares had a maternal hospital stay of more than three days (5%) or experienced a transfer to a higher level of care for delivery (4%). Twelve women (4% of the delivery population) experienced severe maternal morbidity (SMM), defined as one or more of the following: blood transfusion during delivery, intensive care unit (ICU) admission during delivery, or hospital readmission within two weeks of delivery. ROAMS reported an SMM rate that is somewhat higher than expected based on a national-level estimate of SMM (1.8%) using data from 2018; however, the RMOMS evaluation uses a different methodology to calculate rates.[72]

Table IV-7: Delivery Care Utilization and Outcomes in the First Implementation Year (Delivery Population, n = 281)

	Count	Percent
C-section delivery	54	19%
Hospital stay of more than three days	13	5%
Transferred to higher level of care for delivery	12	4%
Experienced SMM	12	4%

Notes: SMM is defined as one or more of the following: blood transfusion during delivery, ICU admission during delivery, or hospital readmission within two weeks of delivery. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Expanding access to lactation consultation remains a priority strategy for the ROAMS network. RMOMS participants in the delivery population with no previous deliveries were more likely to receive one or more lactation consultation visits (35%) than those with one or more previous deliveries (18%) (Table IV-8). Less than half of both new and experienced mothers received lactation consultation, falling short of the network's goal to offer the service to 50 percent of the delivery population.

However, the network reported that lactation consultation services provided by one of the ROAMS support service partners (Youth Empowerment Services) are not captured in the patient-level data due to reporting restrictions related to home visitation services. Therefore, the true rate of receipt of lactation consultation services is likely slightly higher than reported. ROAMS also expects lactation consultation rates to increase in the second implementation year because the ROAMS family navigators (a primary source of lactation consultation referrals) did not join the network and begin making referrals until late in the first implementation year. Moreover, the network's lactation consultant was not permitted to visit the local ROAMS network hospital for several months due to COVID-19 restrictions, which temporarily reduced her ability to reach new RMOMS participants immediately after delivery.

Table IV-8: Lactation Consultation Rates in the First Implementation Year (Delivery Population, n = 281)

Lactation Consultation Status	First Delivery (n = 113)		Not First Delivery (n = 168)	
	Count	Percent	Count	Percent
Attended meeting with lactation consultant after delivery	40	35%	31	18%
Did not attend meeting with lactation consultant after delivery	15	13%	17	10%
Receipt of lactation consultation unconfirmed or unknown	58	51%	120	71%

Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Of the 248 women who reached at least 12 weeks postpartum during the reporting period (the postpartum population), 82% received a postpartum visit within the ROAMS network in the first 12 weeks after delivery. ROAMS also reported high levels of postpartum patients receiving an offer of effective contraception after delivery (81%) and postpartum depression screenings (81%).

Table IV-9: Postpartum Care Utilization in the First Implementation Year (Postpartum Population, n = 248)

	Count	Percent
Received postpartum visit within 12 weeks of delivery	204	82%
Postpartum care provider is in the RMOMS network	204	82%
Offered effective contraception after delivery	201	81%
Received postpartum depression screening	202	81%

Notes: The postpartum population includes members of the delivery population who were at least 12 weeks out from delivery. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Support Services

ROAMS also reported data on the receipt of support services during the first implementation year for the maternal/clinical population. The network offered family navigator services to 8 percent and one or more types of support services to 20 percent of the total population. Food, transportation, and other locally available services, such as referrals to local youth agencies, were the most common referral types. The network enrolled very few (<5) women into Medicaid or private insurance, but the network overall serves a very small uninsured population and has reported that most patients already have insurance by the time they receive care from the network.

Table IV-10: Receipt of Support Services in the First Implementation Year (Total Population, n = 463)

Measure	Count	Percent
Received at least one visit with patient/family navigator	37	8%
Received one or more support services (e.g., food, housing, transportation assistance)	94	20%

Note: Support services are defined as food assistance, housing assistance, transportation assistance, emergency financial assistance, or other support services. "Other" may include patient navigation visits, childcare, First Steps, SUD treatment, and other locally available services. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

ROAMS network clinicians identified SUD as a major problem affecting local communities, but small sample sizes for reported SUD use and treatment prevent tabular reporting of patient-level data for SUD-related care and outcomes. The network reported that 18 percent of the delivery population reported tobacco use during pregnancy, higher than the 2020 national and statewide averages for smoking among women of reproductive age,[73] and less than five percent of the delivery population reported alcohol abuse or SUD.

More data are available on behavioral health (mental health and substance use) screenings and referrals for the total population (n = 463). These findings show that 49 percent of the population received a positive screening, indicating a mental or SUD-related health concern (Table IV-11). Among those who screened positive, 103 individuals (or 22%) were not referred to services or reported as already being in services, reflecting an unmet need for care. An additional nine percent did not receive a behavioral health screening.

Table IV-11: Behavioral Health (Mental Health and Substance Use) Screenings and Referrals (Total Population, n = 463)

Metric	Count	Percent
Received screening; screened negative	225	49%
Received screening, screened positive, and referred to services or already in services	91	20%
Received screening, screened positive, and not referred to services	103	22%
Did not receive behavioral health screening or unknown	44	9%

Notes: Behavioral health services include any clinical or counseling services for mental health and/or substance use. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Among those who screened positive for behavioral health needs, enrollment in treatment data revealed gaps in care (Table IV-12). Just 38 percent of those who screened positive for a mental health need or a substance use need enrolled in treatment, while only six percent who screened positive for both types of problems enrolled in treatment. Only one individual who was not referred for treatment enrolled on her own without a referral from the ROAMS network, suggesting that individuals who do not receive referrals are very unlikely to seek out treatment on their own.

Table IV-12: Treatment Enrollment Status for RMOMS Participants Who Screened Positive for Behavioral Health Needs (Subset of Table IV-11 Population, n = 194)

Metric	Count	Percent
Enrolled in treatment for mental health needs OR substance use needs	73	38%
Enrolled in treatment for mental health AND substance use needs	12	6%
Not enrolled in any treatment for behavioral health needs or unknown enrollment status	109	56%

Notes: Behavioral health services include any clinical or counseling services for mental health and/or substance use. Source: patient-level data submitted by the awardees in June and December 2021. One of the 73 people enrolled in treatment did so without a referral from the ROAMS network. The first implementation year was September 1, 2020 to August 31, 2021.

Patient-Level Data and Reporting Challenges

The ROAMS network utilizes a manual data abstraction and reporting process. Interviewees reported that evaluation data collection remains time-intensive and that network clinical partners require significant support from the network's data lead to create timely and accurate data submissions. This approach has resulted in good data quality, but at the cost of significant labor hours. Some interviewees reported that integrating new ROAMS initiatives, such as family navigation, into their preexisting electronic health record (EHR) systems has been very difficult, suggesting a need for revisions or upgrades to make the EHR systems serve the needs of the network. EHR system types vary across network sites and have very limited capability for automatic data exports and revisions.

> "…Being in a pilot program, it tends to get more difficult as you go along and as more things are added on, so you really don't have a whole lot of time to go back and go, okay, well, we need to fix this…I've got three other new problems to deal with that need as much attention as the original." – ROAMS Leadership

The ROAMS network also has the smallest population of all three awardees. While the network serves an important AI/AN population, small sample sizes often prevented the reporting of key outcomes and disparities for this and other racial and ethnic subgroups, especially for uncommon or rare outcomes like SMM.

V. TX-RMOMS Comprehensive Maternal Care Network (Texas)

The TX-RMOMS network spans six counties in southwest Texas: Val Verde, Uvalde, Real, Kinney, Zavala, and Edwards. Under the leadership of University Health in San Antonio (Bexar County), its target population is women of childbearing age (15–44) residing in the target counties or receiving care from the network providers in these counties. The majority of TX-RMOMS participants (86%) self-identify as Hispanic. In the first implementation year, TX-RMOMS provided RMOMS participants with perinatal case management services and established protocols for implementing telehealth services for women with high-risk pregnancies. This chapter reviews the network's composition, the main network goals and activities, and maternal and infant outcomes during the first implementation year.

A. TX-RMOMS Network Characteristics

TX-RMOMS operates out of two de facto service areas, Uvalde and Val Verde, each anchored by a rural hospital and described below.

Network Partners and Collaboration

Under the continued leadership of University Health and in partnership with the Texas Medicaid agency, the TX-RMOMS network includes two rural hospitals, two Federally Qualified Health Centers (FQHCs), one Rural Health Clinic (RHC), and a private family practice. Two of these partners, United Medical Center (UMC) and Sage Family Medicine Associates (Sage), officially joined the TX-RMOMS network during the first implementation year, formalizing partnerships started in the planning year. Facilities in both Uvalde and Val Verde coordinate with University Health in San Antonio to provide more advanced care, including maternal–fetal medicine (MFM) care. Figure V-1 illustrates the patient journey for TX-RMOMS participants.

Table V-1: TX-RMOMS Network Partners

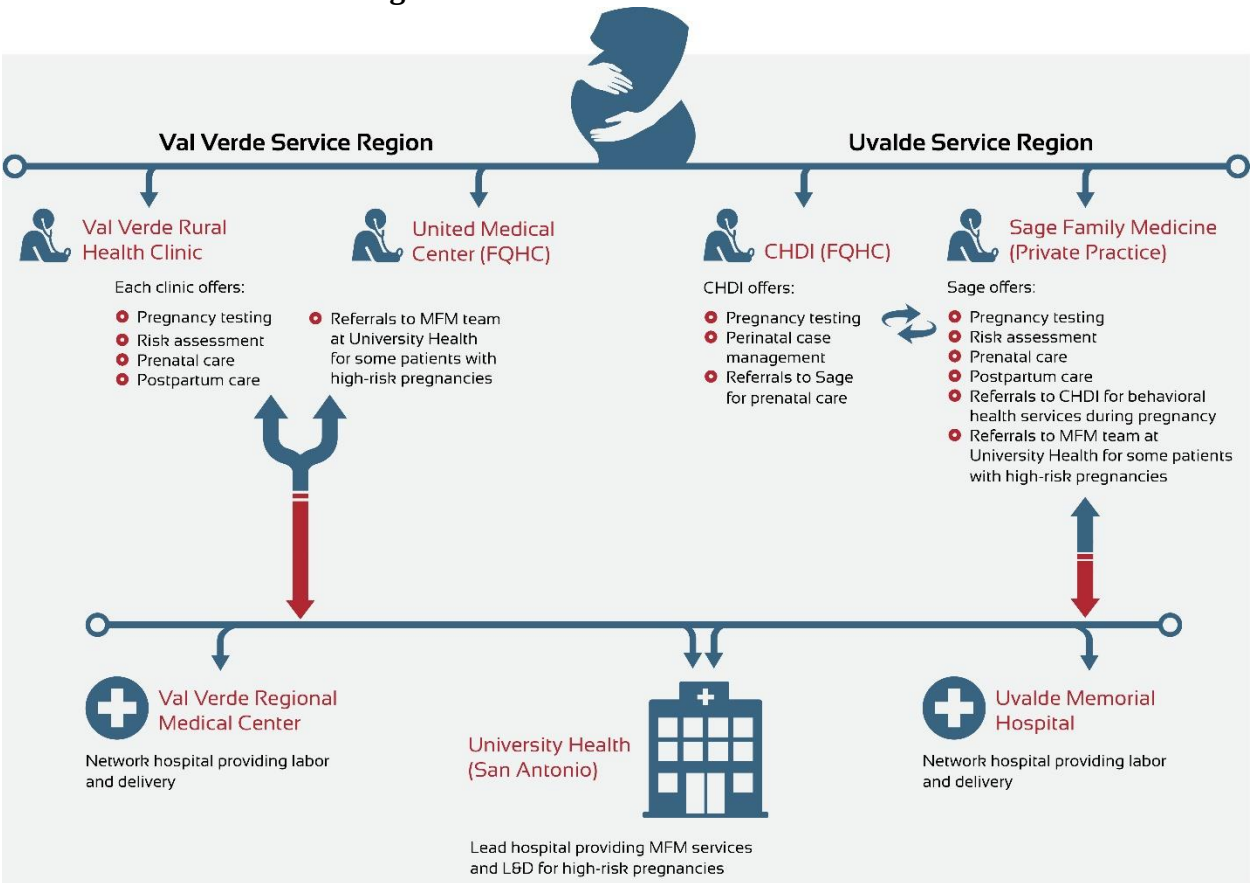
Network Partner	Network Role	Status	Service Area: Uvalde	Service Area: Val Verde
University Health	Awardee lead; Hospital system	Continuing	●	●
Val Verde Regional Medical Center (VVRMC)	Rural hospital	Continuing		●

Network Partner	Network Role	Status	Service Area: Uvalde	Service Area: Val Verde
Uvalde Memorial Hospital (UMH)	Rural hospital	Continuing	●	
Val Verde Rural Health Clinic (VVRHC)	RHC	Continuing		●
Community Health Development, Inc. (CHDI)	FQHC	Continuing	●	
United Medical Center	FQHC	New		●
Sage Family Medical Associates	Private practice	New	●	
Texas Medicaid	State Medicaid agency	Continuing	●	●

Notes: University Health primarily serves the San Antonio region but may serve RMOMS participants living in the Uvalde or Val Verde service areas.

Bringing UMC and Sage into the TX-RMOMS network helped address gaps in prenatal care identified during the planning year. At the start of the planning year, VVRHC had just one part-time obstetric provider, making it difficult for pregnant individuals to schedule timely prenatal care appointments. By comparison, UMC had two clinics in Del Rio with two full-time obstetricians who attended most of the births at VVRMC. When it became clear that UMC was a major provider of pregnancy-related services in the area, TX-RMOMS initiated discussions with the UMC clinic closest to VVRMC, and that clinic became an official network partner. In Uvalde, the FQHC offered pregnancy testing but not prenatal care, so the clinic referred women to another clinic or practice outside the area when they became pregnant. The partnership with Sage provided TX-RMOMS participants with a local source of in-network prenatal care.

Figure V-1: TX-RMOMS Patient Flow



Source: Graphic designed by the evaluation.

Network Challenges and Responsive Strategies

During the first implementation year, TX-RMOMS worked to overcome a series of challenges that emerged in the planning year, slowing progress toward building a stable and cohesive network. The coronavirus disease 2019 (COVID-19) pandemic ended in-person meetings and contributed to staff shortages and turnover at network clinics and hospitals. Staff who were already stretched thin were further overwhelmed by data reporting requirements. The clinics in Val Verde also faced an influx of migrant families at the Texas–Mexico border, including many pregnant women requiring medical care. Under these challenging circumstances, the two rural service areas had limited bandwidth to participate in network-wide meetings. Communication between clinics in the same service area increased, however, as local partnerships started to take root.

> "One of the biggest challenges that we're experiencing right now is limited staff. And a lot of the staff that we have are wearing multiple hats. And so to ask somebody to step away for a training, even if that's for the betterment of their own professional development and for the betterment of our organization as a whole, that's still asking a lot." – TX-RMOMS Leadership

During the first implementation year, TX-RMOMS scheduled virtual network-level meetings with key representatives from all sites and convened local team meetings with rural providers to

improve communication and engagement in network activities across the sites. Network leadership hopes these meetings will promote collaboration through ongoing discussion of implementation challenges and lessons learned, and through recognition of progress towards network goals.

Partners in each of the two rural service areas also made concerted efforts to connect with each other during the first implementation year. In Val Verde, an in-person meeting between staff representing UMC and VVRHC helped build awareness of locally available resources. At that time, VVRHC offered prenatal classes but did not have a behavioral health counselor available on site. UMC did not have prenatal classes but did refer pregnant individuals to a behavioral health counselor. Each clinic left the meeting with the knowledge of a new local resource available to RMOMS participants. Reflecting on the benefits of that in-person meeting, one interviewee stated, "I think the collaboration, it's always been there, but I think now we really understand the need to keep collaborating to make sure that the patients are up to date with the latest resources that they could have."

In Uvalde, increased communication among local providers created a growing appreciation for the potential benefits of belonging to the network. A representative from CHDI, for example, described how the clinic's involvement in TX-RMOMS helped build a stronger relationship with UMH; she noted, "One of the greatest successes for us being in RMOMS is being able to get that relationship with […] the hospital, that has been great." As a common entry point into the TX-RMOMS network, CHDI brings together three local sources of care that serve the same population. Prior to TX-RMOMS, these three facilities rarely intersected, resulting in a patchwork of services that women had to navigate on their own. TX-RMOMS provided the impetus for these entities to coordinate with one another in the service of their shared patient population. Although there is room for improvement, the network demonstrated progress in replacing silos with an integrated system of care for women of reproductive age.

> "COVID was definitely a challenge, but it also became a proven factor that despite COVID our program remains strong … it basically shows that we will have sustainability even after the funding is over because of the partnerships that we're forming; it's not all about the money and the contractual work." – TX-RMOMS Network Staff

The TX-RMOMS network has had substantial difficulty establishing network communication protocols, service coordination, and data collection and reporting systems, which some network staff attribute to the disruptions of the COVID-19 pandemic. However, almost universally, interviewees regarded the network's expansion – both in terms of additional partners and enhanced availability of services - as one of the greatest strengths of the network. While acknowledging that many aspects of implementation, such as collecting patient-level data, were more burdensome than anticipated, several interviewees said they will consider the effort worthwhile if it improves women's access to appropriate care.

B. Network Model and Goals

TX-RMOMS spent the first implementation year focusing on its core strategy of enhanced case management services. The network continued to pursue other strategies – such as use of telehealth for specialty care and expanded workforce capacity – but local clinics prioritized delivery of case management services that include patient education, regular access to a medical assistant or nurse, active follow-up throughout pregnancy and postpartum, and support for enrolling women in Medicaid or obtaining other resources.

Enhanced Case Management

The network clinics used the TX-RMOMS funding to hire perinatal case managers to improve care coordination for women from preconception through the postpartum period. At VVRHC and UMC, when a pregnant patient comes in for a prenatal visit with the doctor, the patient also meets with the perinatal case manager, who provides pregnancy-related education and connects her with needed support services.

> "[The perinatal case manager] acts as a really strong advocate for a lot of these women and helps them with whatever they need. And she encourages them to eat well, exercise. Gestational diabetes is kind of a big thing here, so trying to help them keep all of that stuff under control and just really have healthy pregnancies." – TX-RMOMS Leadership

The perinatal case manager at CHDI serves a slightly different role, since the clinic offers pregnancy testing and case management services but not prenatal care. When CHDI patients become pregnant, the clinic refers them to providers who offer prenatal care. To stay connected with these patients, the clinic also offers perinatal case management services, which involves an RMOMS case manager checking in with them by phone at least once per trimester. CHDI has been offering perinatal case management services to all pregnant RMOMS participants since the implementation year started, although not all women take advantage of these services.

One of the primary ways case managers support TX-RMOMS participants is by helping those who are uninsured enroll in Medicaid. The need for such assistance is clear, as Texas consistently has the highest rate of uninsured people in the country (21%).[74] Among non-elderly women in Texas, uninsurance rates are as high as 22 percent.[75]

TX-RMOMS' perinatal case managers also provide patient education to promote healthy behaviors and address perceived barriers to breastfeeding. One case manager begins talking with RMOMS participants about the benefits of breastfeeding early in their pregnancies. This simple intervention helps fill a gap that has persisted since the onset of the COVID-19 pandemic when lactation consultants from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) stopped visiting women seeking breastfeeding support due to hospital visitation restrictions.

Perinatal case managers help ensure continuity of care by reminding TX-RMOMS participants about upcoming appointments, following up after missed appointments, and generally making themselves available to address patient questions or concerns. As one perinatal case manager, who observed improved patient engagement and more consistent attendance at postpartum visits, shared, "Being involved so much with the patient, like showing them, we really do care about them and we're here to hear you, we're here to help you with anything that you need and just making them feel comfortable…I think that's one of the main things and it's because the patient comes in and you've seen them throughout their whole pregnancy, they're more open to tell you things."

> "Everything we're doing right now is focused on improving maternal care…through the RMOMS clinical coordinator, [we are] following these patients closely, keeping patients locally that may skip appointments because it's not feasible for them to travel. I mean, that's rewarding just to think that maybe we can provide that level of care to our patients locally and they won't have the stress and worry of having to travel an hour and a half away." – TX-RMOMS Clinician

Telehealth

The network did not achieve its goal of providing specialty care via telehealth visits in the first implementation year, but TX-RMOMS remains committed to this goal. As part of the planning work, the rural sites acquired telehealth carts that support real-time consultations with the MFM team in San Antonio, but problems related to connectivity and security delayed implementation. The telehealth cart will allow an MFM specialist in San Antonio to remotely view a live ultrasound image and direct the local sonographer on the probe positioning, thereby providing diagnostic support. Although the clinics had the medical equipment, they were short on technicians at the rural sites who could participate in advanced sonogram training.

As TX-RMOMS continues to work toward specialty telehealth visits, some providers have started to use telehealth for routine care. For example, when COVID-19 rates spiked, clinics offered telehealth visits to pregnant individuals who feared potential exposure to the virus, and CHDI's perinatal case managers conducted all patient outreach by phone. Not all TX-RMOMS participants have access to a smartphone or laptop, however, and other participants preferred face-to-face visits, so telehealth was not universally available to the target population.

> "It's tough. Because if you can't even get your workforce to be certified, then how do you expect for them to be able to provide those services? And then if there's so few people available to provide those services, a lot of those times, those people can't be spared to then go on and get further professional development training…We can't spare anyone to go. So it's like we just keep not progressing because we can't afford to let anyone progress." – TX-RMOMS Leadership

Expand the MCH Workforce in the Service Areas

TX-RMOMS also sought to expand rural maternal health care workforce capacity through hiring efforts and telehealth training. Though the network gained a full-time physician for VVRHC and continues to support perinatal case managers in the clinics, staff recruitment and retention remains a challenge. As one interviewee shared, "Recruiting providers in a small [area] like Uvalde, it's very difficult. Now with COVID, it's even worse. I would spend most of my time recruiting...it was so hard that we had to stop." Interviewees in Val Verde voiced similar concerns.

> "Recruiting providers to rural sites has been a huge challenge, not just for this grant, but for all positions across the whole hospital….If they came from across the country or something, a lot of times they don't last very long…And even if they're from Texas, and even from maybe say a bigger urban area like Dallas or Houston…that also can be a challenge. Because moving from a big urban area like that to a very rural remote area like we are, it's a big change." – TX-RMOMS Leadership

Network partners also struggled to identify individuals with the credentials required for some of the open positions, a challenge that is not unique to the TX-RMOMS program. For example, lack of professional supervision was one reason clinics had difficulty identifying behavioral health counselors; as one interviewee stated, "Social workers have to get a certain number of hours to become certified. We don't have a person in Del Rio that can act as a supervisor. So anyone here that is trying to get their clinical training, they have to have a remote supervisor who they do not see in person. So it's very challenging. We just run into all sorts of hurdles like that that are so much bigger than this program that it's more of a systemic challenge than even a programmatic challenge."

Patient Navigation for High-Risk Pregnancies

Closely related to its telehealth goals, the TX-RMOMS network set out to improve outcomes for women with high-risk pregnancies by providing better access to specialty care. The network hired a patient navigator to serve as a liaison between the rural sites and the MFM team at University Health, but relatively few women were referred to University Health. After consulting with the MFM team, the leadership team learned that providers at the rural clinics may need more guidance when screening for risks. As a representative of the leadership team explained, "The maternal–fetal medicine team has identified that there's education needed to let these doctors know there's several diagnoses – whether it be for maternal–fetal medicine or even for fetal cardiac condition – that they should be looking at to provide us a referral early on versus waiting till something is detected in some type of screening or in a visit, and having those consultations done sooner." The leadership team plans to have an MFM specialist offer additional training to rural providers on early monitoring and identification of health complications or morbidities to promote timely referrals and delivery of risk-appropriate intervention as needed.

C. Health Equity

Pregnant women in rural Texas face multiple axes of health inequity based on geopolitics, socioeconomic factors, insurance status, sex, race, and ethnicity. The network serves a young, majority-Hispanic population with high rates of uninsurance. As a counterpoint to these barriers

to care, the TX-RMOMS network offers the advantage of a health care workforce that reflects and resembles the patient population.

In the first implementation year, TX-RMOMS facilitated several health equity strategies, including the launch of a free diaper program, foundational work toward an accessible telehealth platform, and access to social safety net programs. The diaper program offers new mothers free diapers at their scheduled postpartum visits, and has effectively reduced missed appointments. Providers also articulated how telehealth will help mitigate health inequities by providing women with high-risk pregnancies access to specialists. As one provider shared, "[Telehealth] will have a big impact on our patient population as well, because again, they're not having to travel or take time off or have a significant other take time off to take them to visits. I think if we can provide it locally, it will be a great benefit to our population."

Other changes initiated by the network have helped improve access and quality of care for this underserved population. For example, integrating Sage Family Medicine and UMC into the network gave pregnant individuals access to additional providers and a wider range of resources. The network also created an entirely new position in each clinic when it hired the perinatal case managers. Network participants universally consider this position to be one of the most important provisions of the TX-RMOMS program, and the individuals who fill these positions have been invaluable resources for providers and RMOMS participants. Interviewees shared examples of the ways in which perinatal case managers promoted health equity; for example, they addressed low health literacy among RMOMS participants by educating them about insurance benefits, nutrition needs, and resources that are available to them during their pregnancies and postpartum.

D. Sustainability

Sustainability did not constitute a primary focus during the first implementation year, although it remains an overarching priority. One barrier to the network's sustainability is its infrastructure for data collection and reporting. Several issues made it difficult for the network to provide complete data on patient-level care. The primary challenge stemmed from network partners using different electronic health record (EHR) systems. If the clinic and hospital where a patient received care used non-interoperable EHR systems, records could not easily be extracted from one system and merged with another. Different sites also used inconsistent methods for recording referrals, resulting in missing data. The network has engaged a contractor, Affinity Consulting Group, for data management, but concerns about patient privacy make this assistance less appealing to some partners. Additionally, some interviewees view the burden of data collection and reporting as a distraction from providing excellent care to RMOMS participants. After the RMOMS funding ends, the network will almost certainly need to continue reporting on the services it delivers and the impacts of those services for the communities they serve to support the eventual sustainability of the network.

The addition of new partner sites at UMC in Del Rio and the Sage clinic in Uvalde are also positive moves toward a sustainable network. Sage's presence in the network provides women with a local source of prenatal care, while UMC's engagement brought one of Val Verde's most experienced obstetricians into the network.

> "Right now the perinatal case manager is 100% funded through RMOMS. Well, I think her position is great, whether the data shows it or not….Our patients like her, they trust her. They call her all the time. So whether or not the data shows that, I think her position is very valuable at this point and I would love to keep her on well beyond the program once it ends." – TX-RMOMS Network Staff

There is some concern over whether and how new staff that were hired through the RMOMS program might be retained when the RMOMS funding ends. These new staff are considered extremely valuable because they directly improve the patient experience by assisting with Medicaid enrollments and by providing much more health education than was possible before. This concern was underscored by the fact that attracting qualified staff to this rural community, paying them what they are worth, and encouraging them to stay is a constant, pressing challenge for health systems. Staff do not want to lose personnel who add so much value.

One of the biggest wins for TX-RMOMS has been the ability to get RMOMS participants enrolled in Medicaid, but network staff caution that the high rate of underinsurance in Texas, as well as the proportion of women in the RMOMS service area who are not eligible for Medicaid, present persistent barriers to the sustainability of the RMOMS network. It is not clear whether TX-RMOMS plans to work with Medicaid managed care organizations (MCOs) to ensure coverage for the network's future maternal telehealth initiatives.

> "Texas did not expand Medicaid. We're also the highest in terms of uninsured population in the county. So with this comes a pretty good explanation for why we're not as good at providing prenatal care because it could be really good but the patients might not come [because they have no means to pay for it]. So creating a service line does not mean patients will come." – TX-RMOMS Leadership

E. Maternal Health Outcomes in the First Implementation Year

During the first implementation year (September 1, 2020 to August 31, 2021), TX-RMOMS providers provided pregnancy-related care to 1,333 individuals. This total does not include 409 women who delivered at VVRMC or UMH but had no other connection with the TX-RMOMS network. Overall, 1,333 women received prenatal care from a TX-RMOMS clinic and delivered at a network hospital, resulting in the "delivery population." The tables that follow focus on this population.

Of the 1,333 individuals in the core maternal/clinical population, 780 received prenatal care from a TX-RMOMS clinic and delivered at a network hospital. Another 553 individuals received prenatal care but did not deliver before August 31, 2021.

Table V-2: TX-RMOMS Maternal/Clinical Population in the First Implementation Year

First Implementation Year Counts
1,333 individuals served by TX-RMOMS for pregnancy-related care
780 RMOMS participants delivered **788** infants in-network, with
411 individuals delivering and reaching at least 12 weeks postpartum in the reporting period and receiving postpartum care in the TX-RMOMS network.

Notes: Pregnancy losses before 20 weeks of gestation were excluded from these figures and the entire patient-level data analysis. Women who received delivery-only care from VVRMC or UMH (n = 409) were excluded from the patient-level data analysis. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Table V-3 shows the age distribution and insurance status of all individuals served during the first implementation year. Most of the TX-RMOMS participants were between the ages of 18 and 34. Relatively few individuals were under age 18, but more than ten percent were considered advanced maternal age (i.e., 35 and over). Most TX-RMOMS participants identify as Hispanic (largely White and Hispanic). Women with Medicaid outnumbered women with any other type of insurance. The share of uninsured individuals was much lower than the state average for the total population (21%), likely reflecting pregnancy-only Medicaid coverage.[74]

Table V-3: Demographic Characteristics of Maternal/Clinical Population Served by TX-RMOMS in the First Implementation Year (Total Population, n = 1,333)

Characteristic	Count	Percent
Age (years)		
Under 18	33	2%
18–25	590	44%
26–30	366	27%
31–34	187	14%
35 and over	157	12%
Race/ethnicity		
White (non-Hispanic)	150	11%
Black (non-Hispanic)	25	2%
Hispanic (any race)	1,143	86%
Other, multiple, or unknown race	15	1%
Health insurance status of total population with data reported (n=1,213)		
Medicaid	590	49%
Private insurance	457	38%
Military insurance	82	7%
Uninsured or other	84	7%

Note: Health insurance status was unknown for 120 individuals. Percentages are calculated excluding these cases. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Prenatal Care and Risk Factors

Maternal health services and outcomes are reported for the 780 individuals who received outpatient prenatal care from a TX-RMOMS clinic and delivered at an RMOMS hospital. Less

than half of the individuals who delivered during the first implementation year received prenatal care during the first trimester. The rates of prenatal care were higher, however, among individuals with high-risk pregnancies (56%).

Overall, 45 percent of the delivery population received prenatal visits in the first trimester (Table V-4). Hispanic women were less likely to receive prenatal care in the first trimester. Because of small cell counts, data are not shown, but findings indicate that close to two-thirds of white non-Hispanic women who delivered during the first implementation year received prenatal care in the first trimester. By comparison, less than half of the Hispanic women who delivered received prenatal care in their first trimester.

Compared to women with low-risk pregnancies, women with high-risk pregnancies were more likely to begin prenatal visits in the first trimester. Just two percent of women received a consultation with an MFM specialist. Telehealth visits are not reported with other prenatal care utilization data because some telehealth visits may have occurred during the postpartum period. Because the dates of each telehealth visit were not reported, it was not feasible to identify which ones occurred during the prenatal period.

Table V-4: Prenatal Health Care Utilization by High-Risk Status in the First Implementation Year (Deliveries with In-Network Prenatal Care, n = 780)

Measure	Count	Percent
Received first trimester prenatal visit	352	45%
Not a high-risk pregnancy (n=427)	155	36%
High-risk pregnancy (n=349)	196	56%
Received MFM consultation	14	2%
Received at least five prenatal visits	358	46%

Notes: The high-risk status of the pregnancy is unknown for four individuals. They are reported in the top row, but not in the second and third row of this table. High-risk pregnancy is determined by the prenatal care provider and may be due to medical, obstetric, behavioral health, or genetic problems identified during pregnancy. Additionally, women aged 35 and over are identified as high-risk due to advanced maternal age for TX-RMOMS only. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Labor, Delivery and Postpartum Care

Although prenatal care data is missing for a large share of the births, the delivery data provides insight into infant health outcomes for the delivery population. Most infants (86%) were delivered full-term; gestational age was not available for seven percent of this group (Table V-6). Five percent of infants had a low birthweight. Neither rural hospital has a neonatal intensive care unit (NICU), but a small number of infants (less than 1%) stayed in the hospital for observation after the mother was discharged. Data on infants with NICU stays at University Health were not available at the time of reporting.

Table V-5: Infant Health Outcomes in the First Implementation Year (Infant Population with In-Network Prenatal Care, n = 788)

Characteristic	Count	Percent
Gestational age		
Preterm birth (<37 weeks)	54	7%
Full-term delivery (37+ weeks)	676	86%
Unknown gestational age	58	7%
Birthweight		
Low birthweight (<2,500 grams)	40	5%

Notes: Preterm birth is before 37 weeks of gestation. Low birthweight is less than 2,500 grams. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Thirty percent of the TX-RMOMS delivery population had a Cesarean section (C-section) delivery (Table V-6). Though this rate is lower than the state's reported average of 35 percent in 2020, it is higher than the Healthy People 2030 maximum target goal of 23.6 percent for low-risk pregnancies.[2,53] Women with high-risk pregnancies had higher C-section rates (35%) than women with non-high-risk pregnancies (26%), although both rates remained above the Healthy People 2030 maximum target.

Interviewees reported that a small number of individuals were transferred to a higher level of care for delivery; however, these transfers were not reported in the patient-level data, so the actual number is unknown. Two percent of the delivery population experienced severe maternal morbidity (SMM), defined as one or more of the following: blood transfusion during delivery, intensive care unit (ICU) admission during delivery, or hospital readmission within two weeks of delivery.

Table V-6: Delivery Care Utilization and Outcomes by High-Risk Pregnancy Status in the First Implementation Year (Delivery Population, n = 780)

Measure	Count	Percent
C-section delivery	231	30%
Not a high-risk pregnancy (n=427)	110	26%
High-risk pregnancy (n=349)	121	35%
Hospital stay of more than three days	15	2%
Experienced SMM	12	2%

Notes: The high-risk status of the pregnancy is unknown for four individuals. SMM is defined as one or more of the following: blood transfusion during delivery, ICU admission during delivery, or hospital readmission within two weeks of delivery. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Of the 780 women who delivered during the first implementation year, 411 were also due for a postpartum visit within the reporting period. Nearly three-quarters of those women attended a postpartum visit (Table V-7). Only one of these individuals was reported as receiving postpartum care outside the network.

Contraception counseling and depression screening do not appear to be standard practice at postpartum visits. Just 36 percent of women were offered contraception within 60 days of

delivery, and 34 percent of women were screened for postpartum depression. Less than a quarter of the women in the postpartum population attended at least one meeting with a lactation consultant within six weeks postpartum.

Table V-7: Postpartum Care Utilization in the First Implementation Year (Postpartum Population, n = 411)

Measure	First Implementation Year	
	Count	Percent
Postpartum care provider is in the RMOMS network	410	99.8%
Received postpartum visit within 12 weeks of delivery	296	72%
Offered effective contraception after delivery	147	36%
Received postpartum depression screening	139	34%
Attended meeting with lactation consultant after delivery	80	19%

Notes: The postpartum population includes members of the delivery population who are at least 12 weeks out from delivery. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Support Services

All 1,333 women served by TX-RMOMS were eligible for support services through the network. However, TX-RMOMS sites did not consistently record receipt of support services such as food, housing, and transportation assistance, in part because the network did not have a formal process for referring women to these sources of support. Although perinatal case managers shared information about community resources, they did not track the uptake of services. Case managers mentioned that women with Medicaid coverage could arrange for transportation to appointments, but few women took advantage of this benefit. Similarly, if local support for housing was available, it was not a widely known resource.

There was more awareness of the need for behavioral health services, but clinics had not incorporated routine screening into all prenatal and postpartum visits. As a result, TX-RMOMS reported that 94 percent of TX-RMOMS participants did not receive behavioral health screening during the first implementation year (Table V-8).

Table V-8: Behavioral Health (Mental Health and Substance Use) Screenings and Referrals (Total Population, n = 1,333)

Measure	Count	Percent
Received screening; screened negative	76	6%
Received screening, screened positive, and referred to services or already in services	--	--
Received screening, screened positive, and not referred to services	--	--
Did not receive behavioral health screening	1,254	94%

Notes: Behavioral health services include any clinical or counseling services for mental health and/or substance use. Cell counts are suppressed for figures below 10 (indicated with "--"), and corresponding percentages mask actual cell count. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

The network reported some participation in patient navigation services and educational offerings during the reporting period (Table V-9). Sixteen percent of women visited with a patient navigator at least once during their pregnancy, and eight percent attended one or more educational sessions, including postpartum support groups.

Table V-9: Receipt of Support Services During the First Implementation Year (Total Population, n = 1,333)

Measure	Count	Percent
Received at least one visit with patient/family navigator	210	16%
Attended one or more educational sessions	103	8%

Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Patient-Level Data and Reporting Challenges

Collecting and reporting patient-level data proved much more burdensome than the network anticipated. There were several barriers, including the use of different EHR systems by network clinics and hospitals. In addition to interoperability problems, interviewees reported that some requested data points could not be easily extracted from the EHR. For example, some information required for the evaluation was stored in free text fields or as handwritten notes that required manual data entry into the patient-level data file. Other information had to be synthesized from multiple sources. As one interviewee described, gathering patient data was "very cumbersome because the data is in the EHR, but you have to pull 10 different reports to turn [in] this one report." Other services were not tracked consistently across sites, making it difficult to determine whether a service was never offered, or was simply not recorded. With the COVID pandemic, TX-RMOMS providers and clinic staff who were already stretched too thin had to find ways to continue delivering safe care to a quickly growing patient population. Under these circumstances, implementing new reporting requirements was infeasible.

VI. RMOMS Program in the First Implementation Year

This final chapter integrates the findings from the three awardees to assess the lessons learned in the first implementation year. It brings together key outcomes from the patient-level data, assesses the role of the network structures in the RMOMS implementation process, and reviews how the three networks expanded maternal health care in their service areas. It ends with a brief discussion of the next steps for the evaluation.

A. Maternal Health Outcomes

Given their distinct models, each awardee reported data reflecting different populations and referral patterns. For example, BPN in Missouri offers high-risk pregnancy care within the network and only reported data on local deliveries and prenatal care at two network hospitals and affiliated prenatal care providers; the network did not report outcomes for the small number (<15) of out-of-network referrals, which typically take place for cases where the infant requires surgical care. ROAMS in New Mexico does not offer tertiary-level care or neonatal intensive care unit (NICU) care within the network, leading to higher rates of missing data for certain types of outcomes that took place at external facilities. TX-RMOMS has a tertiary facility (University Health) within the network, but reported delivery data for the two rural hospital populations only. For these reasons, the findings presented here should not be interpreted as a comparison of performance across the three awardees. Rather, these data should be considered the basis for tracking each awardee's performance over the implementation period.

For the individuals who delivered in the first implementation year, key infant health outcomes provide one basis for tracking performance over time. Rates of low birthweight ranged from 5 percent (TX-RMOMS) to 11 percent (BPN) (Table VI-1). Preterm birth for both BPN and ROAMS occurred at higher rates (12% and 12%, respectively), than the Healthy People 2030 target, although TX-RMOMS performed slightly better (7%) than the target.[2] Both ROAMS and TX-RMOMS have less access to complete and accurate NICU stay data than BPN.

Table VI-1: Delivery Outcomes Among the RMOMS Infant Populations in the First Implementation Year

Metric	BPN	ROAMS	TX-RMOMS	Healthy People 2030 Maximum Target
Low birthweight (<2,500 g)	11%	10%	5%	--
Preterm birth (<37 weeks)	12%	12%	7%	9.4%
Infant(s) had NICU stay	3%	6%	<2%	--

Notes: Preterm birth is before 37 weeks of gestation. Low birthweight is less than 2,500 grams. Source: patient-level data submitted by the awardees in June and December 2021 and U.S. Department of Health and Human Services, Healthy People 2030. The first implementation year was September 1, 2020 to August 31, 2021.

Care patterns and health care utilization reflect different service models and starting points for the three awardees, including for high-risk pregnancies and higher-intensity services, such as Cesarean section (C-section) deliveries or care for severe maternal morbidity (SMM) (Table VI-2). ROAMS had the highest percentage of maternal–fetal medicine (MFM) consultations among the three awardees, but this percentage includes ultrasound reads completed by a

previously contracted MFM provider for one of the network's rural hospitals and does not reflect the network's not-yet-launched telehealth MFM initiative. TX-RMOMS had the highest rate of C-section deliveries for both high-risk and non-high-risk pregnancies and performed worse than the Healthy People 2030 target of 23.6 percent (for low-risk pregnancies).[2] BPN and ROAMS both reported SMM rates that are somewhat higher than expected based on national-level estimates of SMM (1.8%) using data from 2018; however, the RMOMS evaluation uses a different methodology to calculate rates.[72] The SMM rate for TX-RMOMS (2%) was closer to the national rate. BPN had the highest rate of longer maternal hospital stays (more than three days) of the three awardees.

Table VI-2: Delivery Care Utilization and Outcomes Among the RMOMS Delivery Populations in the First Implementation Year

Measure	BPN	ROAMS	TX-RMOMS
Received MFM consultation	5%	29%	2%
Hospital stay of more than three days	8%	5%	2%
C-section delivery overall	19%	19%	30%
High-risk pregnancy	16%	23%	35%
Not a high-risk pregnancy	18%	13%	26%
Experienced SMM	5%	4%	2%

Notes: SMM is defined as one or more of the following: blood transfusion during delivery, ICU admission during delivery, or hospital readmission within two weeks of delivery. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Both BPN and ROAMS had higher rates of early prenatal care (78% and 72%, respectively) than TX-RMOMS (45%) (Table VI-3). BPN and TX-RMOMS reported data only for RMOMS participants who received prenatal care from RMOMS providers and delivered at selected network hospitals, while ROAMS reported data for the entire maternal/clinical populations (including women who received prenatal care outside of the network and/or who delivered outside of the network). Between 72 percent (TX-RMOMS) and 82 percent (ROAMS) of RMOMS participants received a postpartum visit within 12 weeks of delivery; postpartum visit measures could not be calculated for BPN.

Table VI-3: Health Care Utilization at RMOMS Awardee Network Providers in the First Implementation Year

Metric	BPN	ROAMS	TX-RMOMS
Received prenatal visit in first trimester	78%	72%	45%
Delivery took place at RMOMS network hospital	100%	76%	92%
Received postpartum visit within 12 weeks of delivery	--	82%	72%

Notes: The metrics for prenatal visit and delivery location use the delivery population. The postpartum visit metric uses the postpartum population. Due to missing data for BPN, the evaluation could not reliably determine the number of participants who delivered and reached at least 12 weeks postpartum in the reporting period to calculate postpartum measures. Source: patient-level data submitted by the awardees in June and December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Data Reporting Challenges and Interpreting Findings

Patient-level data reporting has placed a large burden on awardees and required considerable RMOMS resources for planning, collecting, and extracting the required data elements. Electronic health records (EHRs) often lack the capability to generate automated reports containing prenatal, labor/delivery, and postpartum care data. As a result, many partners have relied on chart review and manual data abstraction, a process that can take up to an hour per record. In addition, linking data across partners for RMOMS participants requires the sharing of identifiable information, which places additional legal and technical requirements on awardees. Finally, data from non-network partners have been understandably difficult to access due to a lack of formalized relationships and resource-sharing.

As a result of these challenges, patient-level data may be incomplete or may not accurately represent true service delivery patterns. For example, all three awardees are missing some or all data on RMOMS participants who transferred out of the network for delivery, a common occurrence for high-risk pregnancies in particular. Telehealth services, behavioral health needs, and lactation consultation have also proven difficult to collect and report, especially those that require collection in the postpartum period when many women no longer attend regular visits in the network. Other data elements require manipulation from their EHR format into the evaluation format, especially data elements that contain Protected Health Information (PHI) that cannot be submitted to the evaluation team, increasing the level of effort required for reporting.

The lack of standard definitions of high-risk pregnancy, changes in target population over time, and fluctuating network composition have also made the comparison of measures over time and across awardees a challenge. BPN limited its patient-level data reporting in the baseline period to a very small subset of the population at one network hospital (described in the 2019 Cohort First Annual Report), but expanded reporting to a larger population at two network hospitals and affiliated prenatal care providers for the first implementation year. BPN also reports some patient-level data elements using birth certificate data from the Missouri Department of Health, a unique hybrid approach among the three awardees. In contrast, ROAMS consistently reported data for the same maternal/clinical population across both years, allowing year-to-year comparisons for ROAMS alone. TX-RMOMS encountered significant data quality challenges, especially during the baseline period, and high rates of missing data have limited opportunities for robust data analysis.

Some awardees have questioned the value of patient-level data reporting, given the burden and potential payoff. All three awardees have reported burden, and just one (ROAMS) has utilized patient-level data measures to support its own internal financial analyses. Moving the needle on some maternal health outcomes may be infeasible within the four-year cooperative agreement, especially as both internal and external forces have delayed the launch of major initiatives. However, awardees may realize benefits from using the patient-level data to support continuous quality improvement efforts, as opposed to using it solely for the evaluation of long-term program impacts. For example, BPN looks forward to analyzing data generated by the System Care Coordinator (SCC) on unsuccessful referrals to develop mitigating interventions, while ROAMS has used the evaluation's patient-level data to corroborate its own internal survey data exploring why some RMOMS participants opt to deliver at non-network facilities. Using data to

support program initiatives, engage in continuous quality improvement, or strengthen strategic planning may help RMOMS awardees realize additional value from their investment in data collection and reporting.

B. The Role of the Networks in Achieving RMOMS Goals

RMOMS networks consist of diverse partners that provide services along the entire continuum of maternal care, including hospitals, Federally Qualified Health Centers (FQHCs), support services providers, and others (Table VI-4). Many of these partners did not collaborate in meaningful ways prior to RMOMS. As a result, RMOMS awardees have dedicated considerable time and resources to building robust and cohesive networks with clinical sites, support services agencies, and other local partners actively involved in program implementation.

Table VI-4: Awardee Network Composition at the End of the First Implementation Year

Awardee Network Partners	BPN	ROAMS	TX-RMOMS
Lead Agency	Saint Francis Medical Center	Holy Cross Medical Center	University Health
Number of Counties	6	5	6
Total Hospitals/Systems	3	3	3
Other Clinical Partners	1 FQHC network	4	2
Behavioral Health Agencies	3	0	0
Support Services Providers	1	5	0
Other Partners	6 health departments; SSM Health Perinatal Center	University of New Mexico	NA
State Medicaid Program	MO Healthnet	Centennial Care	Medicaid

Notes: Includes formal network partners only. For ROAMS, the support services category includes some behavioral health services.

Role of the Lead Agency and Decentralized Network Initiatives

The RMOMS awardees demonstrate that varying network structures, sizes, and levels of integration can improve access to maternal health care. Large hospitals with advanced levels of care anchor both the BPN and TX-RMOMS networks with support from smaller regional hospitals and clinical partners. In contrast, all three hospitals in the ROAMS network, including the lead agency, are Critical Access Hospitals (CAHs), with fewer than 25 acute care inpatient beds each.[70] Despite the challenges in launching a new pilot program during coronavirus disease 2019 (COVID-19), all three awardees have made at least partial progress on their major maternal health strategies.

ROAMS' structure could potentially explain its comparative success in launching decentralized initiatives and offering flexibility to network sites, particularly its expanded prenatal care strategy. Holy Cross Medical Center partnered with an FQHC in Questa, north of Taos, to host in-person prenatal clinical hours, but the network supported a telehealth-only prenatal care expansion model that made more sense for the sister partnership between Miners Colfax Medical Center and Union County General Hospital prenatal clinic, which covers a greater geographic

area. This approach has allowed both arms of the network to expand prenatal care access with customization that fits their local contexts and prevents delays in one arm from affecting roll-out in the other. ROAMS also found success in hiring all of the network's family navigators as full-time employees of the lead agency after learning that other network sites were unable to take the risk of hiring positions that will lose their funding source when the RMOMS funding ends, demonstrating the strength and flexibility of the network to fill in potential staffing gaps and avoid sustainability risks. ROAMS' strong leadership from the network's executive director also contributed to the network's success and its ability to cooperate as a network, despite encountering challenges.

> "The idea of having a true collaborative network is really more about education and experiences versus patient sharing. Because of the distance, we don't send patients to Taos, and Taos doesn't send patients to us." – ROAMS Clinical Provider

BPN and TX-RMOMS have both experienced challenges related to centralization with their lead agencies, which occupy a different position from the other network hospitals. Saint Francis Medical Center houses most of BPN's RMOMS activities, including its flagship SCC position. This structure has enabled a scaled roll-out, but it led to less active engagement from clinical partners outside of Saint Francis. TX-RMOMS' lead agency, University Health, planned to make maternal–fetal medicine (MFM) services available to women residing in rural areas using telehealth, but multiple barriers, including connectivity problems, staffing shortages, and training requirements, have delayed implementation. The network also faced challenges recruiting clinicians and staff with the credentials to fill open positions in rural clinics. TX-RMOMS also oversaw relatively few referrals to University Health for high-risk pregnancy cases during the first implementation year, which has affected the ability of University Health to serve as an active partner in providing clinical care and support to the rural sites. This challenge has resulted in a contrast where University Health has provided leadership in selecting network strategies but, thus far, has had less direct involvement with patient care.

Table VI-5: Role of Partners in Network Activities

Activity	BPN	ROAMS	TX-RMOMS
Network-wide telehealth initiative	Planned	Implemented; additional planned	Planned
Employment of patient navigator or care coordinator	Implemented at one site, planned expansion	Implemented at multiple sites	Implemented at multiple sites
Clinical providers physically travel to other network sites to provide care	--	Implemented between two sites	--
Clinical providers provide telehealth services to other network sites	--	Implemented between two sites	Planned
Pursuit of Medicaid policy changes	In progress	In progress	--
Referrals to social service providers	Implemented	Implemented	Implemented

Role of Competition

The ROAMS and TX-RMOMS clinical partners have different patient service areas within the larger network service areas. In Texas, Val Verde Rural Health Clinic (VVRHC), Val Verde Regional Medical Center (VVRMC), and United Medical Center (UMC) serve the Val Verde service area, and Community Health Development Associates, Inc. (CHDI), Sage Family Medicine Associates (Sage), and Uvalde Memorial Hospital (UMH) serve the Uvalde service area. Similarly, Taos County in New Mexico has a separate service delivery system from Colfax and Union counties. These structures have led to natural division in regular patient caseloads and little to no competition between participating network clinical partners, which may help promote collaboration on shared goals. For TX-RMOMS, network participation helped overcome some limited competition between a participating FQHC and a private practice prenatal care provider, and offered a way for both practices to collaborate to provide local prenatal and support services care. Both TX-RMOMS and ROAMS lack access to high-risk pregnancy or MFM care at their rural hospital sites, which may improve their motivation to pursue initiatives like telehealth MFM care that offer a completely new service line.

Clinical partners within BPN, on the other hand, share service areas and regularly compete for patients, impacting network cohesion. BPN lost a major hospital system, which accounts for nearly a third of deliveries in the service area, primarily due to its long-standing competitive relationship with the awardee lead. Network sites have expressed concern about the allocation of telehealth equipment and patient navigators and the potential risk of losing local patients who may opt for telehealth visits at other network locations. The network has made the most progress on the SCC position at Saint Francis Medical Center and intends to expand this service to other network sites. Delay in expansion beyond Saint Francis may make one of BPN's early successes less visible to other network partners.

Referrals as an Indicator of Network Strength

Referrals across network partners help demonstrate network strength, indicating not only partner willingness to work together to meet participant needs, but also established processes and tracking mechanisms. BPN employs the SCC, TX-RMOMS has perinatal case managers, and ROAMS has family navigators, all of which help connect RMOMS participants to insurance, breastfeeding services, and other social supports in the community.

Why Referrals Succeed

- Referrals respond to unmet need in the community
- Creating new linkages fills in gaps rather than attracting patients away from clinical partners
- Network partners can collaborate on referrals, even when complex clinical collaboration (e.g., shared MFM initiatives) sees delays

Awardees reported network-level referral data for the first time during the first implementation year. All three awardees reported at least some referrals, but these are likely underreported due to data challenges. BPN had the most referrals overall. The vast majority of BPN referrals are for support services, reflecting BPN's strategic focus and partner commitment to collaborate on this type of support. ROAMS had the highest rate of referrals per RMOMS participant, evenly

divided between referrals to social supports and clinical services, demonstrating strong network connections to both types of partners in the service area. TX-RMOMS had fewer referrals during the first implementation year, a potential reflection of a lack of tracking capacity, few partnerships with social service programs, and limited services altogether in the service area.

Table VI-6: Referrals Reported During the First Implementation Year

Referral Type	BPN	ROAMS	TX-RMOMS
Total	675	426	30
Support services	593	213	20
Specialty clinical services	82	213	10
Referrals per 100 participants	52	92	2

Notes: Support services include insurance assistance, financial assistance, transportation, and other types of non-clinical offerings. Specialty clinical services include medication-assisted treatment (MAT) for opioid use disorder (OUD) and care for medical complications (e.g., MFM services). Source: network-level data submitted by awardees in December 2021. The first implementation year was September 1, 2020 to August 31, 2021.

Types of Communication and Collaboration

COVID-19 setbacks made regular network engagement challenging, but interviewees across all three networks reported feeling supported by network leadership and feeling able to reach out with questions, concerns, or input about network strategies.

The ROAMS network has the most robust communication and collaboration infrastructure of the three awardees. The network has a Governing Council, several active workgroups, regular meetings between leadership and clinicians, meetings between clinical providers and patient navigators, telehealth Grand Rounds, and other types of regularly scheduled collaboration. ROAMS also collects input from RMOMS participants through a Mothers' Advisory Council and patient surveys, another unique strategy among the three awardees. This infrastructure has helped ROAMS make significant implementation progress and promote greater partner engagement.

BPN replaced its multiple workgroup approach with two virtual monthly meetings to apprise partners of implementation progress. This approach helped streamline collaboration and promote effective communication in the first implementation year. As BPN launches more cross-partner initiatives, including the expansion of the System Care Coordination model, telehealth, and the Unite Us referral platform, the network may find the need to once again establish more frequent meetings to support implementation logistics.

Table VI-7: Communication and Collaboration Strategies

Activity	BPN	ROAMS	TX-RMOMS
Network holds regular strategic meetings or trainings	●	●	Planned
Network holds regular clinical trainings or meetings	Planned	●	Planned
Network collects feedback from RMOMS participants on network strategies	Planned	●	

TX-RMOMS discontinued in-person meetings due to COVID-19 and struggled to find staff time for network-wide initiatives, but the network successfully facilitated smaller in-person meetings between staff in its two rural regions. These local meetings helped identify opportunities for shared referrals and raised awareness of community resources. The network will enact a greater focus on regularly scheduled collaborations during the second implementation year, including monthly leadership meetings and a monthly meeting series with rural partner organizations.

Lessons Learned

This section presents the lessons learned on the role networks have played in achieving RMOMS goals and recommendations for developing effective networks.

Identify and Fill Network Gaps in Care

Awardees generally cast a wide net when creating their networks, pulling in partners that provide a range of services across their counties. However, awardees also found success in identifying and responding to specific regional needs. TX-RMOMS recognized that its network lacked prenatal care providers in one service area, identified local referral patterns, and recruited two new partners as a result. ROAMS, which serves the largest geographic area of the three awardees, easily identified large regions where no prenatal or delivery care existed prior to the creation of the network, resulting in a clear starting place to begin engagement with rural clinics and hospitals in those areas. In contrast, BPN has greater access to prenatal and high-risk pregnancy care locally, but identified a cross-network need for referrals and an expansion of the network's SCC position.

> Networks remain responsive to regional maternal health challenges that can burden staff. ROAMS reported that a non-network hospital fired nurses that refused to get the COVID-19 vaccine and had to shut its obstetrics department as a result, which may affect access to maternal health care in the region. A BPN home visitation program also lost staff due to the vaccination requirement. TX-RMOMS addressed a humanitarian crisis on the border in the town of Del Rio, further compounding staff burden and local maternal health challenges.

Spread Governance Responsibility across Network Partners

The designation of a "network lead" is a requirement under the HRSA cooperative agreement. All three networks are led by large hospital systems; however, both BPN's and TX-RMOMS' leads are located outside of the service area. These agencies have taken on the bulk of the planning and implementation activities, potentially leading to partner disengagement or delays in connecting ambitious services across sites. ROAMS also has a lead agency, but has seen more decentralized engagement in network initiatives across all partner organizations. Networks can promote an effective balance of power and engagement across partners by sharing governance activities.

Offer Opportunities for Engagement and Collaboration Early On

Strategy implementation takes time, and if network partners do not experience benefits from collaboration early on, they may feel less engaged in network activities. Networks should identify strategies that can produce "early wins" for all partners, thus solidifying network cohesion. Examples include the BPN Cuff Kits, the ROAMS prenatal care expansion and family

navigator positions, and the TX-RMOMS perinatal case managers. Awardees can also consider whether and how to engage Medicaid managed care organizations (MCOs) in strategic initiatives and sustainability efforts.

Incorporate Clinician Perspective into Network Activities

All networks have indicated that network strategic planning benefits from clinician participation, suggesting the need to move forward in a way that balances this benefit against the increased burden on staff. ROAMS noted that clinicians do not sit on the Governing Council, which typically oversees the major strategic direction of the network. However, the network has balanced this concern by establishing regular communication activities, such as clinician workgroup meetings, and designating a rotating Medical Director position; network leadership reported that the Medical Director has proven to be an essential facilitator of the ROAMS network strategies. Overall, networks should engage clinicians by communicating how network activities will directly benefit their patients, such as by connecting them to social supports or reducing no-show rates. Engaging clinicians can sometimes require caution and sensitivity to their preferences and contexts, especially for those who have worked on their own for many years and have less experience in joining shared initiatives.

Plan for Staff Turnover

Networks have also encountered staff turnover within partner agencies. For example, ROAMS lost a social service partner after the director left the organization and the board struggled to find a replacement. BPN has also faced challenges engaging with potential partners due to staff turnover, while TX-RMOMS had to secure buy-in from a new executive-level staff member at one of the network hospitals that had been hired between the time of the RMOMS application submission and the RMOMS funding. Awardees also noted that staffing in rural areas remains a problem overall, especially for highly specialized positions requiring education and training. Possible future actions to overcome these barriers may include establishing multiple point people within a partner agency to advance RMOMS initiatives or offering training opportunities to facilitate recruitment for specialized positions.

Consider Existing Competitive Relationships when Building Network Initiatives

Networks should be aware of existing competitive relationships and potential partner concerns about losing market share due to network participation. Leadership can address these concerns by ensuring that their maternal health strategies fill in gaps in care and promote greater use of existing services rather than diverting patients out of the community. Networks can formulate strategies that add to their network partners' capacity. For example, BPN aims to better connect women to *existing* services to reduce barriers to clinical care and has had early success in making referrals to support services, which may help assuage partner concerns about competitive disadvantage. ROAMS has realized success from engaging partners to pursue new services, such as new prenatal care clinics and telehealth MFM services, which fill in existing gaps in care. None of the ROAMS sites have high-risk pregnancy care available in person, resulting in the telehealth MFM initiative's acceptance among clinical partners that will benefit from its launch.

C. Expanding Care for RMOMS Participants

By definition, the experience of the perinatal period in a rural area constitutes high need, and the RMOMS program aims to address the specific circumstances of rurality. Pregnancies that are complicated by health conditions, behavioral health needs, and other risk factors can be further complicated by long distances to specialized care, a lack of access to certain support services, and the stigma associated with accessing behavioral health care in a small community where confidentiality may feel impossible. RMOMS networks have implemented multiple strategies to address these issues and improve maternal and infant health outcomes.

Patient Navigation and Referrals to Behavioral Health and Support Services

All three RMOMS networks expanded referral services and patient navigation assistance during the first implementation year. Awardees have employed different focus areas for their patient navigation services; for example, BPN connects RMOMS participants to essential support services, TX-RMOMS invests significant time in increasing Medicaid enrollments, and ROAMS family navigators guide patients through the standardized PCHI Pathways patient navigation program and Twistle home telehealth program. Despite these differences, all awardees have dedicated staff to serve as a single, familiar contact for patients. Their work has led to increased enrollments in Medicaid for eligible individuals, provided essential support during pregnancy, and opened access and education about the RMOMS networks' offerings. Multiple interviewees in the ROAMS network, for example, reported that RMOMS participants "absolutely love" the family navigators and that they provide strong clinical and mental health support during pregnancy. While overall patient volume tends to be low, a reflection of the awardees' work in rural areas, the navigation and referral services have proven valuable for individual RMOMS participants.

However, low levels of trust or engagement in the community can jeopardize referrals to key services. RMOMS participants sometimes reject services that can feel intrusive, such as home visiting, or they may feel unprepared to discuss mental health or SUD treatment with family navigators. Despite these barriers, the familiarity of a single, friendly contact can help de-stigmatize needs for behavioral health and support services. Warm hand-offs and enrollment assistance have led to greater engagement in support services, such as Medicaid, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and home visiting programs. Patient navigators and care coordinators with clinical backgrounds and strong interpersonal skills earn the trust of the communities they serve and provide an important supplement to the clinical offerings available in each network.

Patient navigation services have primarily addressed needs during the prenatal period. As programs grow, awardees will expand their focus to encompass postpartum care and ensure that RMOMS participants are connected to crucial services, such as postpartum check-ups, depression screens, contraception, and lactation support.

Provision of Telehealth Services Focusing on Rural Care Access, Including During COVID-19

Telehealth initiatives for all three RMOMS networks progressed during the first implementation year. These include telehealth prenatal appointments, remote visits with patient navigators,

telehealth MFM consults or ultrasound reads, and home telehealth kits. Various factors have slowed roll-out, including consensus around new equipment, hesitation to refer patients to non-local providers, varying levels of support from clinicians to utilize telehealth, and supply chain shortages. The ROAMS network's telehealth MFM initiative experienced major delays, partially because engaging a new telehealth MFM provider, which will entail remote ultrasound and imaging data transmission, required some ROAMS clinical partners to break existing radiology contracts. Overcoming this challenge required extensive negotiation and has pushed the expected launch into the second implementation year. Similarly, some telehealth initiatives for BPN required capital approval from hospital leadership, which resulted in a similar delay in implementation. Competitive fears or concerns about partners being "left out" of telehealth service delivery also slowed the launch of some initiatives.

Once implemented, telehealth programs can encounter connectivity issues, low technological literacy, or other technical glitches, especially for video appointments. Additionally, while COVID-19 increased telehealth services when patients were reluctant to attend in-person appointments due to infection risk, there was some hesitation among patients and providers to accept or administer prenatal care without an in-person component. However, patients may be more receptive to behavioral health services or patient navigation services via telehealth, since these services do not require a hands-on exam. The ROAMS network found success in combining in-person and telehealth services for prenatal visits; patients at one rural prenatal clinic are triaged and examined by the on-site nurse practitioner and then connected via live telehealth to the obstetrician at the ROAMS partner facility (well over 100 miles away) for the rest of the appointment.

Local Provision of Specialized MFM Care, NICU Care, and Emergency Care

RMOMS participants who need specialized care must often drive long distances, increasing time away from work and family. Networks have different strategies for improving specialty care access depending on local capacity. BPN has good access to local high-risk pregnancy care and rarely refers high-risk pregnancy cases to hospitals outside the network. Therefore, BPN oversees more pregnancies from start to finish, allowing for a complete picture of maternal health outcomes across the continuum of care.

In contrast, the rural hospitals for both ROAMS and TX-RMOMS must refer many high-risk pregnancy cases to higher levels of care, but this introduces follow-up and data tracking challenges. The lead agency for TX-RMOMS, University Health, has the capacity to handle high-risk deliveries, but the network reported no referrals. Although some women with high-risk pregnancies may have chosen to deliver locally, data-sharing challenges likely account for some unreported deliveries at tertiary hospitals. ROAMS lacks data-sharing agreements with non-network hospitals offering MFM care or on-site NICUs, which has resulted in an incomplete understanding of the course of care for some high-risk pregnancies and higher rates of lost-to-follow-up cases. These challenges have also driven both networks to focus on ways to increase access to high-risk care in-network.

Despite these challenges, RMOMS activities, including patient navigation and data-sharing agreements, have improved communication about higher-level care among providers and care

coordination for patients. Other RMOMS initiatives, such as increasing the number of staff available to provide patient education and the provision of training to emergency medical services (EMS) or first responders and staff at non-delivery hospitals, strive to expand the scope of local care to manage certain pregnancy risk factors or maternal/neonatal emergencies. Planned telehealth initiatives in all three awardee networks will include remote delivery of specialized MFM and ultrasound services. Awardees expect a significant impact from these efforts. ROAMS anticipates reduced drive times for prenatal appointments to increase patient satisfaction and access to care, but also to potentially reduce car crashes, a leading cause of maternal death in New Mexico.[76] The ROAMS Twistle home telehealth kits also contain educational content about high-risk pregnancy conditions, which may help more women understand when and how to seek specialized care.

Assessment of High-Risk Pregnancies and Implications for the Evaluation

RMOMS participants whose pregnancies are deemed "high-risk" often need more intensive clinical care or support services. The evaluation aims to assess whether they receive this care, either through network partners or through external referrals. However, the first implementation year revealed challenges with the inconsistent and evolving definitions of "high-risk pregnancy" for each of the three networks. The evaluation's patient-level data flags whether a pregnancy is considered high risk but does not provide awardees with a single standard definition and defers to the patient's clinician to make the determination. Awardees have reported substantial variation in their definitions and variations in how EHR systems record that risk:

- **BPN:** For evaluation purposes, BPN retrospectively tags high-risk pregnancies using a standard definition from the state's birth certificate and vital statistics system. The state's definition captures a range of factors that put pregnancies at risk, including education status and previous birth complications.[iii] While this definition applies to all network sites, and data provide a good picture of overall risk in the area, it does not inform prenatal care provision because it is assigned after delivery. BPN has implemented the Edinburgh Postnatal Depression Scale (EPDS) and the Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences (PRAPARE) assessments to guide the SCC in referrals, but findings are not reported in the patient-level data or used to determine high-risk status.
- **ROAMS:** ROAMS clinical providers review patients' risk factors and judge the need for high-risk pregnancy care based on their clinical experience. The network does not use a standardized screening tool across clinical partners and assesses the need for MFM referrals and out-of-network transfers depending on the individual pregnancy and patient preference. ROAMS data staff review the medical records prior to patient-level data submission to make a determination on whether or not an RMOMS participant is high-risk for the purposes of the evaluation.

[iii] High-risk is defined as: Inadequate prenatal care (less than 50% of expected visits or none); Education status less than 12 years or no GED; Gestation of less than 37 weeks; Previous complicated pregnancies; Number of previous fetal deaths; Prior live births of 4 or more; Weight changes/over or under weight gain; and Overweight/underweight for height.

- **TX-RMOMS:** TX-RMOMS does not have a network-wide screening tool to make high-risk determinations; however, all pregnancies in women aged 35 or over are automatically considered high-risk. Network leadership identified that rural providers need greater support in conducting high-risk screenings and learning when to make referrals.

These within-network and across-network differences lead to difficulties in determining whether women with high-risk pregnancies are receiving the care they need and in reporting standardized high-risk data for the evaluation. However, creating a standardized definition poses additional challenges. Clinicians appreciate flexibility in determining patient care based on their own experience and nuanced knowledge of the patient's condition. In addition, many standardized assessments may not capture the range of issues that inform both clinical care and referrals to social services, such as preexisting conditions, substance use, and housing or food insecurity. Moreover, pregnancy risk status may evolve over time, particularly for patients who begin or cease substance use during pregnancy, experience a change in socioeconomic circumstances, or develop a high-risk condition later in pregnancy (e.g., preeclampsia). Even if awardee partners were to agree upon a standard definition of a high-risk pregnancy, this status would need to be captured in varying EHR systems to facilitate reporting for the evaluation, a functionality that the RMOMS clinical partners typically lack.

Health Equity Considerations

The awardees have all focused on improving maternal health service availability and access across the rural regions they serve, especially through connections to support services and Medicaid insurance. Other initiatives include increasing health literacy through patient education and collecting feedback from local mothers to inform network strategies. However, awardees reported less focus on addressing barriers for specific demographic groups, and small sample size limitations prevented patient-level data reporting of key outcomes for all racial and ethnic subgroups. These challenges preclude a clear understanding of maternal health disparities, especially for smaller populations within awardee regions or for rare maternal health outcomes.

Both ROAMS and BPN have implemented training to orient network partners to health equity issues. ROAMS has also recruited family navigators with lived experience in the communities they serve and conducted patient surveys in English and Spanish to capture community perspectives on maternal health priorities. TX-RMOMS has found success in enrolling RMOMS participants in Medicaid, which helps reduce the percentage of uninsured women in the network. An expansion of these activities may help advance the health equity focus, both in internal operations and in patient-facing maternal health strategies.

D. Conclusions and Next Steps in the Evaluation

Despite implementation delays, all three awardees have made progress on strategies to improve maternal health care in their rural regions. Their network structures have played a key role in this progress, providing an opportunity for partners to work together to connect RMOMS participants to social and clinical services. ROAMS advanced the most strategies, likely due to its network context, decentralized strategies paired with strong leadership, and robust communication across network sites. Clinical partners serve different patient populations across a wide geographic area,

resulting in a collaborative and noncompetitive environment. In addition, ROAMS identified and filled clear gaps in access to prenatal and MFM care. These early successes helped solidify network cohesion. Finally, ROAMS brings many stakeholders to the table for strategic planning, including partner leadership, clinicians, patient navigators, the state Medicaid program, and RMOMS participants. These factors have all facilitated significant progress on nearly all of the network's maternal health strategies and have increased the likelihood of long-term sustainability when the RMOMS funding ends.

Awardees have planned major expansions for the second implementation year (September 1, 2021 to August 31, 2022). All three aim to launch their telehealth MFM initiatives. BPN will expand its System Care Coordination model to multiple outpatient clinics and launch the Unite Us automated referral management system. TX-RMOMS will continue to recruit additional staff for its rural health care workforce and address staffing challenges, particularly for specialized positions. The evaluation will document this ongoing progress and lessons learned to support replication by other similar rural networks.

The evaluation will also place a greater focus on the sustainability of network strategies at participating clinic sites and changes needed to Medicaid or other policies to maintain or advance maternal health progress, especially as states take advantage of COVID-19-related legislative changes that enable new Medicaid postpartum coverage expansion options. The evaluation will consider how policies can sustain new services in the long term and identify any unanticipated negative impacts of network strategies, such as telehealth referral patterns that divert services away from network partners. Finally, awardees are starting to make inroads with state Medicaid programs to streamline enrollment, connect participants to Medicaid-funded support services, improve transportation coverage, and provide additional coverage for postpartum care and patient navigation. This work will be central to future evaluation findings because it will impact not only RMOMS participants in network service areas, but also financial reimbursement and access to rural maternal health care for women in each state with an RMOMS network.

APPENDIX A: DATA SOURCES

The RMOMS evaluation has both process and impact components to assess how the awardees' network models may improve rural maternal health access and outcomes. The process evaluation records the design and function of each awardee's network, their roll-out and strategic processes, and facilitators and barriers to implementing their maternal health strategies. The impact evaluation assesses whether the network models improve access to essential health care services and improve maternal and infant health outcomes. The overall evaluation combines these two components to gain a comprehensive picture of the RMOMS program design in action.

This Second Annual Report builds on the process evaluation focus described in the First Annual Report, which corresponded to the awardees' planning year prior to implementation. The Second Annual Report introduces a stronger focus on impact evaluation, maternal health outcomes, and financial sustainability, but also describes ongoing challenges, such as the coronavirus disease 2019 (COVID-19) pandemic, that have delayed the implementation of key strategic initiatives for all three RMOMS awardees.

The evaluation uses a mixed-methods approach to collect quantitative patient-level data, qualitative interview and site visit data, and secondary data.

A. Awardee Quantitative Data: PIMS and Patient-Level Data

Awardees collect and submit two types of quantitative data for the evaluation covering three distinct maternal health populations. The target, direct services, and maternal/clinical populations represent the differing reach of RMOMS program services and correspond to two types of data collection.

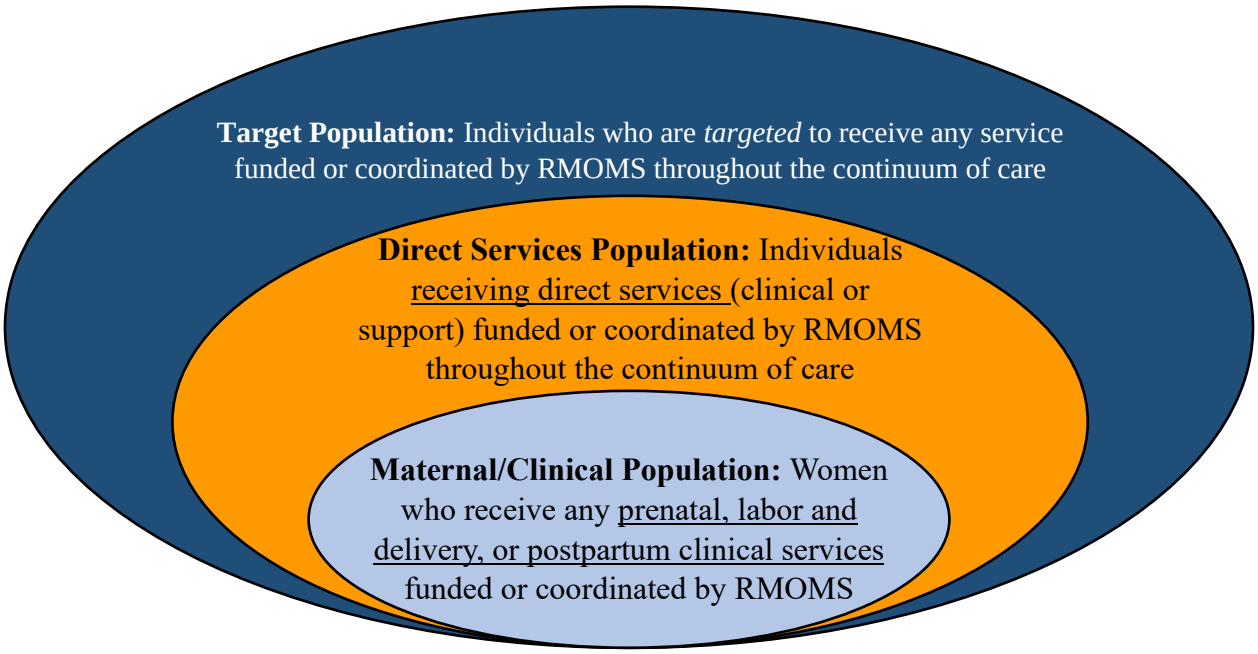
Performance Improvement Measurement System (PIMS) Data

The **target population** represents women, children, and families living in each awardee's service area and whom awardees prioritize for clinical and support services. **The direct services population**, a subset of the target populations, includes all individuals who receive any direct clinical or support services funded or coordinated by the RMOMS program. Awardees submit PIMS data pertaining to both the target and direct services populations; these data include aggregate counts submitted by the awardees directly into HRSA's Electronic Handbooks (EHBs). PIMS data are not reported in the Second Annual Report, but may be reported in future implementation years.

Patient-Level Data

The **maternal/clinical population** captures individuals within the direct services population who receive any form of pregnancy-related (prenatal, labor and delivery, and postpartum) clinical service funded or coordinated by the RMOMS program. This population represents the smallest and most specific of the three overall population types.

RMOMS Population Types



Awardees submit de-identified patient-level data to track health care utilization and health outcomes for the maternal/clinical population. This process represents the most significant awardee data collection and submission activity and forms the backbone of the quantitative evaluation activities. Awardees submit data directly to the evaluation team every six months. The evaluation team calculates annual measures to assess the impact of each RMOMS network and to draw comparisons over each year of the RMOMS program, both within each network and across each network.

Patient-Level Data Challenges

Quantitative data sources pose several challenges and caveats. The RMOMS awardees have encountered challenges in collecting and submitting patient-level data from all network partners, which affects data quality, completeness, and the ability to draw inferences about program impact. Common barriers include technical issues working with electronic health record (EHR) systems, limited staff availability for data collection and reporting, and inconsistent availability of required data elements. The evaluation team collaborates with the awardees and the technical assistance provider to overcome these challenges.

Second, the awardees' network structure and available data preclude pre-post comparisons between RMOMS participants and similar groups of individuals who do not participate in the program. Awardees typically target all or most women in their service areas for participation before, during, or after pregnancy, resulting in the lack of a within-region comparison group.

Finally, the RMOMS program has created a learning lab structure for awardees, who have changed the scope of their programs, adjusted their target populations, and engaged new partners in response to lessons learned. The evaluation tracks changes over time in these characteristics, but small sample size limitations can hinder robust analysis, particularly for smaller clinical

partners, rare outcomes like severe maternal morbidity (SMM), or demographic subgroup analyses.

Awardee Network-Level Data

The evaluation introduced a new network-level data collection activity during the first implementation year to capture awardees' referral patterns and network strengths. Awardees reported data on two primary measures: the number and type of organizations providing direct services to RMOMS participants and the number and type of referrals both within and outside the RMOMS network. These data provide a high-level snapshot of collaborative network activity to support the granular patient-level data.

Future Quantitative Data Collection

Future reports will map the patient-level data to Medicaid fee schedule data to track changes in high-cost services, highlight potential programmatic cost savings, and assess the overall financial sustainability of RMOMS network models. The evaluation may also conduct a quantitative analysis of Medicaid claims data to assess the impact of the RMOMS model on Medicaid beneficiaries in each state in comparison to a similar group of rural Medicaid beneficiaries not affiliated with any RMOMS networks.

B. Awardee Qualitative Data

Qualitative data form an essential component of the mixed-methods RMOMS evaluation. Interviews and awardee documentation reviews provide insight into each awardee's regional context, implementation strategies, program expectations, and challenges.

Interviews

This report includes qualitative findings from two types of interviews: telephone interviews with awardee leadership, clinicians, and staff in November and December 2021, and telephone interviews with state Medicaid program officials in September and October 2021. The interviews with RMOMS program staff and clinicians expanded upon similar interviews conducted in the previous year (the awardee's planning year) and provide important insight into awardee implementation, barriers, perceived impacts, and future plans. The Medicaid official interviews provided information about the interaction of each state's Medicaid agency with the RMOMS network and discussed the feasibility of obtaining Medicaid claims data for a possible future Medicaid claims analysis.

Awardee Documentation

The evaluation reviews several types of awardee documentation to understand their maternal health goals, implementation models, expected impacts, structure and governance, and challenges to date. HRSA requires these documents from each awardee. Typical documentation includes awardee applications, logic models and work plans, data collection summary reports, progress reports, and other verbal and written updates. When possible, the evaluation also reviews findings from awardee data collection activities unrelated to the evaluation (e.g., findings from patient satisfaction surveys).

C. Secondary Data

The evaluation draws on secondary data sources to better understand the national-, state-, and county-level maternal health context for each awardee. While the First Annual Report included quantitative analyses of three secondary datasets from the Healthcare Cost and Utilization Project (HCUP), the Area Health Resource File (AHRF), and the Centers for Disease Control and Prevention (CDC) National Center for Health Statistics (NCHS) National Vital Statistics System (NVSS), this Second Annual Report has shifted the focus from secondary data analyses to primary patient-level analysis. It still includes limited data analyses to enable comparisons for selected maternal health outcomes (described below).

The Second Annual Report also utilizes summary statistics and publicly available secondary data from the following sources:

- **National Vital Statistics System (NVSS) data (2020):** This source provides data on maternal and infant health outcomes for each awardee's state. These data were requested and analyzed by the evaluation team.[53]
- **Medicaid Adult and Child Core Set Measures (2020):** This source provides publicly available benchmark rates for key perinatal measures in the Medicaid Adult and Child Core Sets updated for 2020 (detailed in Table II-4).
- **Kaiser Family Foundation (2019–2022):** The Kaiser Family Foundation maintains tables and trackers on state Medicaid policy, such as the status of state Medicaid expansion and updates on state COVID-19 policies (detailed in Table II-4).
- **Area Deprivation Index (2019):** The Area Deprivation Index, a new data source for the Second Annual Report, provides census block-level data on neighborhood deprivation for public download. These data were downloaded and analyzed by the evaluation team.[55,56]
- **Maternal Vulnerability Index (various years):** The Maternal Vulnerability Index, a new data source for the Second Annual Report, provides open-source county-level data on maternal vulnerability to poor health outcomes.[54]

Finally, the evaluation draws on information from HRSA and other HHS agencies related to maternal health programs and funding sources, peer-reviewed literature on rural maternal health topics, and publications from maternal health research centers. These publications contextualize the RMOMS awardees' maternal health settings and strategic priorities.

APPENDIX B: EVALUATION RESEARCH QUESTIONS

Research Question	Data Source					
	Doc. Review	Interviews	Progress Reports	Patient-Level Data	PIMS	Medicaid Claims*
Network Approach to Coordinating Care						
1. How do network partners coordinate services to improve access to the continuum of care?		P	P		P	
2. What is the governance structure of the network?		P	S			
3. Are awardees able to implement their work plans and achieve outcomes as planned?	P	P	P			
4. What are the barriers and facilitators to creating regional networks that span the continuum of care and improving maternal and neonatal outcomes?		P				
Delivery and Access to Services						
5. What impact do these rural networks have on the types of medical services utilized, settings of care, and patterns of utilization at each site and across the program?				P	S	P
6. What impact do rural networks have on utilization of non-medical resources, referrals, and services, such as transportation, dietary services, and social services?		P	P	P		
7. What role can telehealth, such as fetal monitoring, play in supporting rural clinicians and the obstetric patients they serve?		P	P	P	S	
Maternal and Neonatal Outcomes						
8. Does the program improve clinical outcomes during the prenatal period, labor/delivery period, and postpartum period?				P		P
9. What are the characteristics and risk factors of the patients served?				P		
Financial Sustainability and Viability						
10. Is there a reduction in high-cost, high-intensity services?				P		P
11. What impact did the program have on Medicaid costs and health care utilization?				P		P
12. What strategies are most effective to reduce or avoid high-cost services?		P				
13. Can a regional network with several rural hospitals aggregate obstetric services to ensure enough patient volume to be financially viable and provide high-quality obstetric services?		P				
14. What is the role of Medicaid/other payers in facilitating the network and financial sustainability?		P				
15. How can avoided costs be captured and accounted for?		P				

*If exercised

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