

LEVELS OF CARE ASSESSMENT TOOL (LOCATe)

Carly Holman, MS
Annie Glover, PhD, MPA, MPH
Kaitlin Fertaly, PhD
Megan Nelson, MSW
*Rural Institute for Inclusive Communities,
University of Montana*

MARCH 2022

Rural Institute
UNIVERSITY OF
MONTANA





The LOCATe assessment does not provide a formal designation on level of care and cannot be used by the facility for marketing or promotion purposes.

This project is supported by the Health Resources and Services Administration (HRSA) of the US Department of Health and Human Services (HHS) as part of an award totaling \$9.6 million designed to improve maternal health outcomes with 0% financed with non-governmental sources. The contents are those of the authors and do not necessarily represent the official views of, nor an endorsement by DPHHS, HRSA, HHS, or the US Government.

Table of Contents

Acronym Glossary	4
Executive Summary	5
Risk Appropriate Care	5
The Montana LOCATe Initiative	5
LOCATe Assessment Results	5
Recommendations	6
Conclusion	6
Background	7
Rationale for Assessing Levels of Care	8
Montana LOCATe Initiative	9
Methodology	9
LOCATe Assessment Results	10
Levels of Neonatal Care	10
Montana Deliveries by Level of Neonatal Care	11
Levels of Maternal Care	11
Montana Deliveries by Level of Maternal Care	13
Transport	14
Maternal Care Protocols	16
Discussion	18
Recommendation 1: Perinatal Regionalization	18
Recommendation 2: Cultivating formal and informal relationships across the perinatal health care system	19
Recommendation 3: Maternal Transport Plans	20
Recommendation 4: Enhancing Care through Evidence-Based Practice	21
Recommendation 5: Measure the Impact of Risk-Appropriate Care	22
Limitations of the LOCATe Assessment	23
LOCATe Cannot Formally Designate Levels of Care	23
Facilities Assessing at <Level I Maternal Care	23
Montana-Specific Scope of Practice for Anesthesia Providers	23
Access to Maternal-Fetal Medicine (MFM) Specialists	23
Conclusion	24
References	25
Appendix A	26
Methodology	26
Instrument	26
Participants	26
Survey Administration	26
Data Analysis	26
Limitations	26

Acronym Glossary

Acronym	Full Name
AAP	American Academy of Pediatrics
ACOG	American College of Obstetricians and Gynecologists
AIM	Alliance for Innovation on Maternal Health
CAH	Critical Access Hospital
CDC	Centers of Disease Control and Prevention
CRNA	Certified Registered Nurse Anesthetists
DPHHS	Montana Department of Health and Human Services
ECFSD	Early Childhood and Family Support Division
ECHO	Extension for Community Healthcare Outcomes
FCHB	Family and Community Health Bureau
HHS	US Department of Health and Human Services
HRSA	Health Resources and Services Administration
IHS	Indian Health Service
LOCATe	Levels of Care Assessment Tool
MFM	Maternal Fetal Medicine Specialist
MHA	Montana Hospital Association
MHI	Maternal Health Innovation
MHLC	Maternal Health Leadership Council
MMRC	Maternal Mortality Review Committee
MOMS	Montana Obstetrics and Maternal Support
MPQC	Montana Perinatal Quality Collaborative
NCHS	National Center for Health Statistics
NICU	Newborn Intensive Care Unit
PDSA	Plan-Do-Study-Act
SMFM	Society of Maternal and Fetal Medicine
UM	University of Montana Rural Institute for Inclusive Communities
WHO	World Health Organization

Executive Summary

Risk Appropriate Care

The Centers for Disease Control and Prevention (CDC) developed the Levels of Care Assessment Tool (LOCATe) to support state strategies to enhance risk-appropriate care. LOCATe aligns with the 2017 guidelines and policy statements from the American Academy of Pediatrics (AAP) [1] and the 2019 American College of Obstetricians and Gynecologists (ACOG) and Society of Maternal and Fetal Medicine (SMFM) [2] matching hospital capabilities with maternal and neonatal medical risk.

RISK-APPROPRIATE CARE:

A strategy to support birthing people and infants receiving care in a facility staffed with personnel and resources that match their risk [3].

PERINATAL REGIONALIZATION:

The development, within a geographic area, of a coordinated, cooperative system of maternal and neonatal healthcare [4] with facilities classified into levels based on functional capabilities and organized within a regionalized system of perinatal care [3].

The Montana LOCATe Initiative

Montana implemented version 9.2 of the LOCATe assessment. The data collection occurred from July 23, 2021, to October 31, 2021. Of the 26 birthing facilities in the state, 25 (96%) participated. LOCATe contributes to Montana's efforts to improve maternal and neonatal health in communities large and small through better assessment of the statewide system of care.

Montana made the decision to assess levels of maternal and neonatal care in hospitals as part of the broader Montana Obstetrics and Maternal Support (MOMS) program needs assessment. Stakeholders should interpret the information provided in this report as a preliminary environmental scan of the status of risk-appropriate care in Montana. LOCATe cannot be operationalized as a formal designation of a hospital's level of maternal or neonatal care for use in regulatory or reimbursement policy. While the CDC has validated the truncated LOCATe tool against more intensive designating processes, this assessment is based on self-reported information.

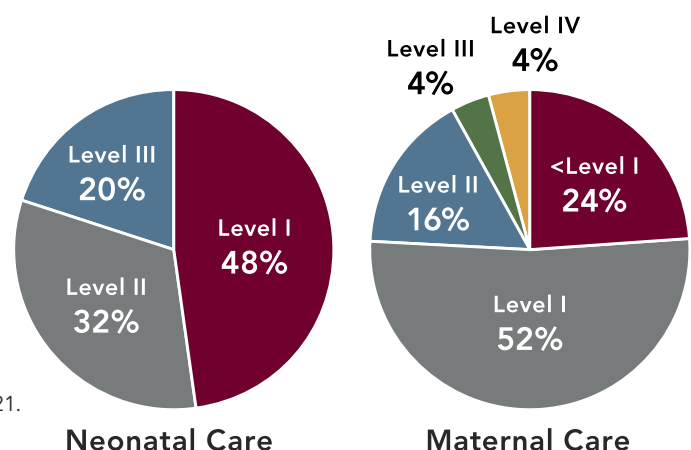
The CDC designed LOCATe for use by public health decision-makers. The results provide a starting point for discussion among stakeholders on improving the health outcomes of birthing people and infants. As of January 2022, 24 states (including Montana), 1 territory, 1 perinatal region, and 1 large multi-state health system have implemented LOCATe.

LOCATe Assessment Results

Figure 1 shows the LOCATe-assessed levels of neonatal care and maternal care for Montana birthing facilities.

Figure 1. LOCATe-Assessed Levels of Neonatal Care & Maternal Care

LOCATe assessment conducted July 23, 2021 to October 31, 2021.



Recommendations

We have outlined five recommendations regarding the provision of risk-appropriate care in Montana.

- 1. Perinatal regionalization:** Ensuring birthing people receive care at a facility prepared to meet their needs will require statewide coordination of all available perinatal care. The MOMS program can act as a convener to organize meetings with facilities, the Montana Department of Health and Human Services (DPHHS), the Montana Hospital Association (MHA), and other maternal health stakeholders to review the needs assessment data, define specific perinatal care regions, and discuss ways to improve the system (e.g., transport, training, emergency protocols). Hospital leadership must encourage and support perinatal care providers to participate in these meetings. The MOMS program should facilitate discussions with hospitals (including those without an obstetrics unit) in each perinatal care region to develop strategies that meet the unique challenges posed by distance and resource scarcities in each area.
- 2. Cultivating formal and informal relationships across the perinatal health care system:** The MOMS program should engage in education and training of providers that situates facilities within a cohesive statewide system of risk-appropriate care. MOMS can reinforce this message through learning communities such as Project ECHO, Simulation Leadership Academy, and the Montana Perinatal Quality Collaborative (MPQC).
- 3. Maternal transport plans:** All CAHs providing emergency obstetric services, <Level I, Level I, and Level II facilities should collaborate with higher-level facilities to develop and maintain obstetric-specific transport plans, per ACOG guidelines, and cooperative agreements to ensure safe, timely, and efficient transport of patients with risk factors and complications.
- 4. Enhancing care through evidence-based practice:** The MPQC should recruit the nine remaining birthing facilities into the second cohort of the Alliance for Innovation on Maternal Health (AIM) Obstetric Hemorrhage Bundle to enhance care through evidence-based practice.
- 5. Measure the impact of risk-appropriate care:** Facilities and state partners should develop a measurement strategy to evaluate the overall impact of risk-appropriate care activities on maternal and neonatal health in Montana. The Montana Maternal Mortality Review Committee (MMRC) should formalize inquiry related to risk-appropriate care in each investigation of maternal death, following CDC guidelines.

Conclusion

Improving risk-appropriate care in Montana will require commitment from providers, hospital administration, DPHHS, local and tribal health departments, and professional associations. We recommend that facilities and maternal health stakeholders use this report to work together to identify barriers to risk-appropriate care and strategies to enhance perinatal regionalization in Montana.



Background

The MOMS program was initiated on October 1, 2019, by a five-year grant awarded to the MT-DPHHS by the Health Resource Services Administration (HRSA) through the State Maternal Health Innovation (MHI) Program (HRSA-19-107) to address maternal health disparities and improve maternal health outcomes. MOMS is implemented through the leadership of the primary grantee, the Title V Maternal and Child Health Block Grant program in the Family and Community Health Bureau (FCHB), within the Early Childhood & Family Support Division (ECFSD) at DPHHS. Two subgrantees, Billings Clinic and the University of Montana (UM), also lead the MOMS project. The grantee and subgrantees implement the MOMS workplan through a team of staff and contractors, as well as through partnerships with statewide entities, such as the MHA, and local clinics, providers, and other stakeholders.

MOMS serves as a convener for quality improvement in obstetric care. The Montana Maternal Health Leadership Council (MHLC) guides and advises the implementation of the MOMS program. The MHLC, which DPHHS coordinates, unanimously endorsed the Montana LOCATe initiative on April 27, 2021. DPHHS contracted with UM to administer LOCATe.

Rationale for Assessing Levels of Care

Access to risk-appropriate care improves maternal and neonatal health by ensuring that birthing people and infants receive care at facilities prepared to meet their needs [3]. The CDC developed the LOCATe Tool to align with the 2017 guidelines and policy statements from the AAP [1] and the 2019 ACOG and SMFM [2] matching hospital capabilities with maternal and neonatal medical risk. LOCATe classifies facilities into levels based on equipment, staff, and volume of services. Receiving care at a facility with the necessary equipment and staff to address risk improves birth outcomes [5]. Table 1 details the maternal and neonatal levels of care.

RISK-APPROPRIATE CARE:
A strategy to support birthing people and neonates receiving care in a facility staffed with personnel and resources that match their risk [3].

PERINATAL REGIONALIZATION:
The development, within a geographic area, of a coordinated, cooperative system of maternal and neonatal healthcare [4] with facilities classified into levels based on functional capabilities and organized within a regionalized system of perinatal care [3].

Table 1. Maternal and Neonatal Levels of Care

Facility	Maternal	Neonatal
<Level I*	Does not meet ACOG/SMFM minimum level designation	---
Level I	Basic Care	Well newborn nursery
Level II	Specialty Care	Special nursery care
Level III	Subspecialty Care	Newborn Intensive Care Unit (NICU)
Level IV	Regional Perinatal Health Center	Regional NICU

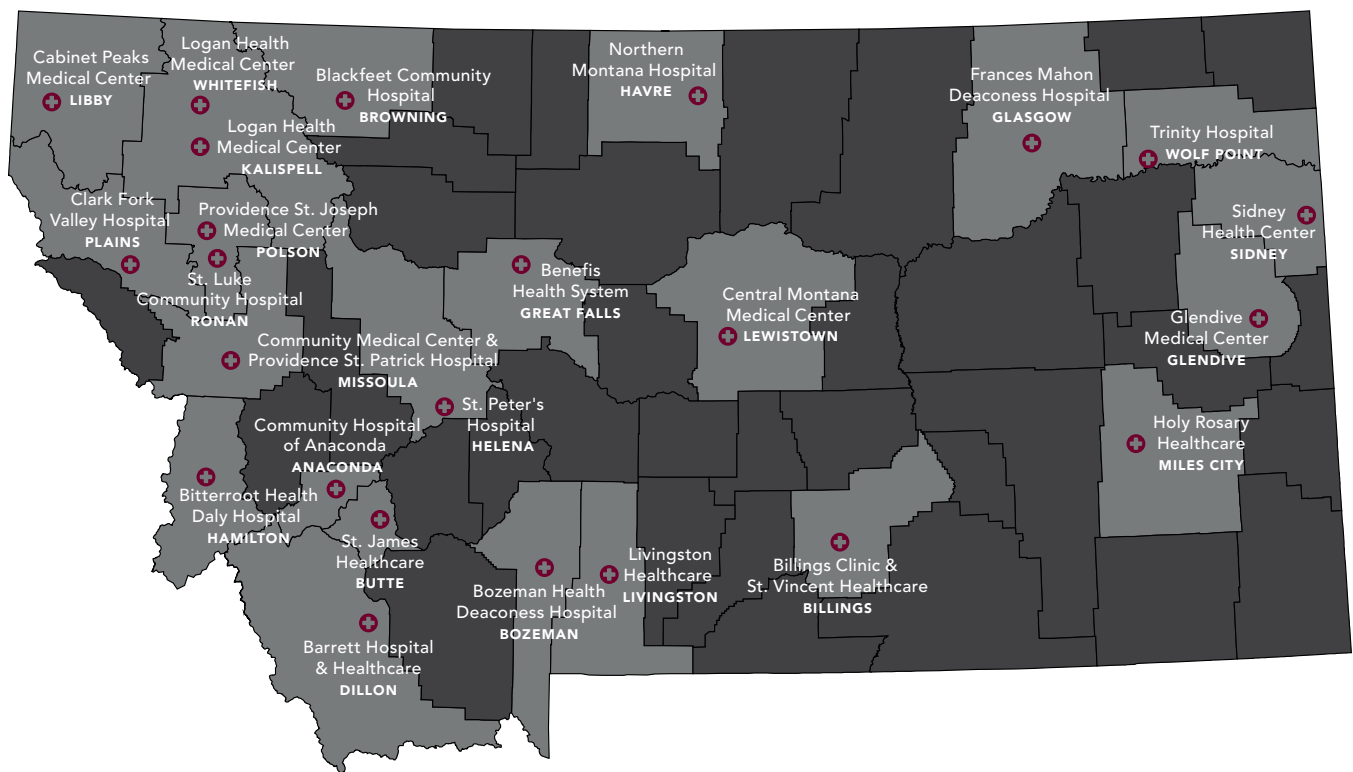
*LOCATe considers facilities <Level I if they don't meet the ACOG/SMFM floor requirements for Level I. The <Level I facilities in Montana operate at Level I.



Montana LOCATe Initiative

The MOMS program commissioned the LOCATe assessment as part of a broader maternal health system needs assessment. LOCATe collects initial data about facility capacity and service delivery in the state, provides facilities with the opportunity to self-assess, and offers areas for facilities to consider changes in practice. Montana has 26 birthing facilities spread across 22 counties. A birthing facility represents a hospital with an obstetrics unit. Figure 2 illustrates the locations of the birthing facilities in Montana. Each facility that participated in LOCATe will receive a report summarizing its results.

Figure 2. Map of Montana Birthing Facilities by County



Methodology

Montana implemented version 9.2 of the LOCATe assessment. The data collection occurred from July 23, 2021, to October 31, 2021. Of the 26 birthing facilities in the state, 25 (96%) participated.

Appendix A provides additional information on this assessment's methodology.

LOCATe Assessment Results

LOCATe asks facilities to self-report their level of neonatal care and maternal care based on the AAP/ACOG/SMFM guidelines. The results include both the self-reported levels and the LOCATe-assessed levels. The LOCATe assessment measures neonatal care and maternal care separately (e.g., a facility may assess at Level II for neonatal care and Level I for maternal care).

Levels of Neonatal Care

Table 2 shows the self-reported and LOCATe-assessed levels of neonatal care. As illustrated in Table 2, most (80%) of facilities LOCATe-assessed as Level I or Level II. Montana does not have any Level IV neonatal care facilities. Three facilities (12%) had discrepancies between their self-reported level of neonatal care and their LOCATe-assessed level of neonatal care. All facilities with discrepancies LOCATe-assessed higher than their self-report by one level.

Table 2. Levels of Neonatal Care

Facility (n=25)	Self Report n (%)	LOCATe Assessment n (%)
Level I	15 (60.0)	12 (48.0)
Level II	5 (20.0)	8 (32.0)
Level III	5 (20.0)	5 (20.0)
Level IV	0	0

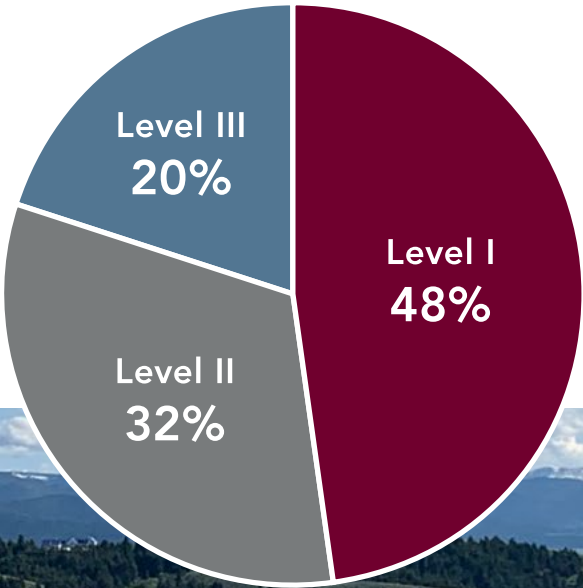
As illustrated in Figure 3, close to half (48%) of birthing facilities LOCATe-assessed at Level I for neonatal care.

Figure 3. LOCATe-Assessed Levels of Neonatal Care

LOCATe-Assessed Levels of Neonatal Care (N=25)

Close to half of birthing facilities LOCATe-assessed at Level I

LOCATe assessment conducted July 23, 2021 to October 31, 2021.



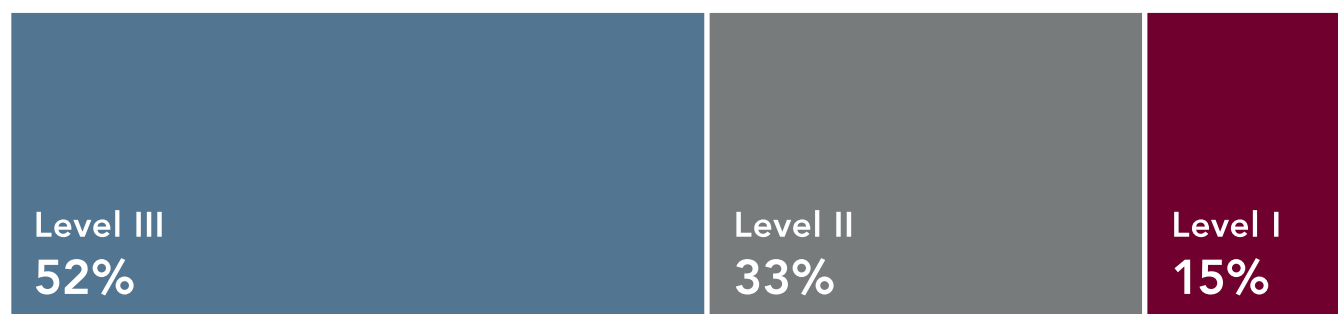
Montana Deliveries by Level of Neonatal Care

As illustrated in Figure 4, in 2018, about half (52%) of deliveries in Montana occurred at facilities that LOCATe-assessed at Level III for neonatal care and the other half (48%) occurred at facilities that LOCATe-assessed at Level II or lower. Figure 4 includes deliveries occurring at birthing facilities that participated in the LOCATe Assessment. It does not include deliveries from the Indian Health Service hospital.

Figure 4. Montana Deliveries by Level of Neonatal Care

Montana Deliveries by Level of Neonatal Care, 2018 (N=10,339)

Over half of births occurred at a Level III neonatal care facility



Source: Montana Discharge Data System and Montana LOCATe Assessment

Levels of Maternal Care

Table 3 shows the self-reported and LOCATe-assessed levels of maternal care. About a quarter (24%) of facilities LOCATe-assessed at <Level I. Forty-eight percent of facilities had discrepancies between their self-reported level of maternal care and their LOCATe-assessed level of maternal care. All facilities with discrepancies LOCATe-assessed lower than their self-report by one level.

LOCATe considers facilities <Level I if they don't meet the ACOG/SMFM floor requirements for Level I.

Table 3. Levels of Maternal Care

Facility (N=25)	Self Report* n (%)	LOCATe Assessment n (%)
<Level I	0	6 (24.0)
Level I	13 (57.0)	13 (52.0)
Level II	5 (22.0)	4 (16.0)
Level III	4 (17.0)	1 (4.0)
Level IV	1 (4.0)	1 (4.0)

*2 facilities responded 'unknown' in self-report; denominator=23

Five facilities self-reported as a Level I for maternal care, and the results of their LOCATe assessment placed them at <Level I. The most common reason for this discrepancy relates to obstetric ultrasound services. To meet Level I requirements, the facility needs to have either limited obstetric ultrasound or standard obstetric ultrasound with interpretation services readily available at all times. Four facilities self-reported as a Level II for maternal care, and the results of their LOCATe assessment placed them at a Level I. The most common reason for this discrepancy relates to facilities lacking a Maternal-Fetal Medicine Specialist (MFM). To meet the Level II requirement, an MFM needs to be readily available at all times for consultation on-site, by phone, or by telemedicine as needed. ACOG guidelines define “readily available at all times” as the specific person should be available 24 hours a day, 7 days a week for consultation and assistance, and able to be physically present on-site within a time frame that incorporates maternal and fetal, or neonatal risks and benefits with the provision of care.

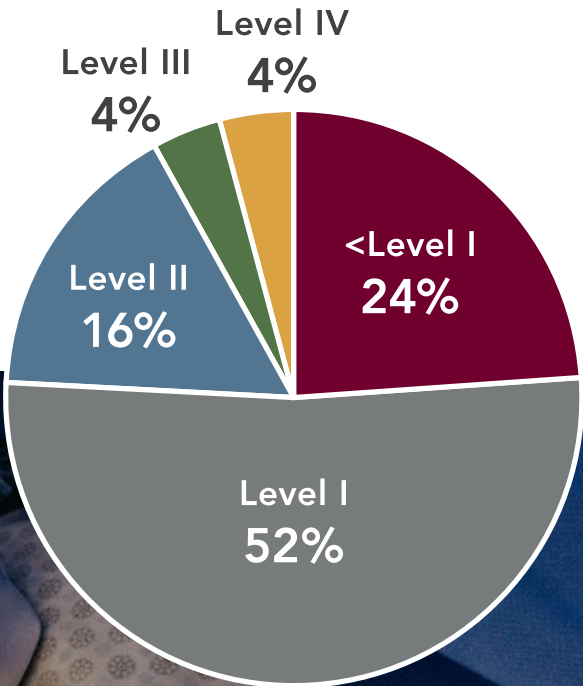
As illustrated in Figure 5, 76% of birthing facilities LOCATe-assessed at Level I or lower.

Figure 5. LOCATe-Assessed Levels of Maternal Care

LOCATe-Assessed Levels of Maternal Care (N=25)

Seventy-six percent of birthing facilities LOCATe-assessed at Level I or lower

LOCATe assessment conducted July 23, 2021 to October 31, 2021.





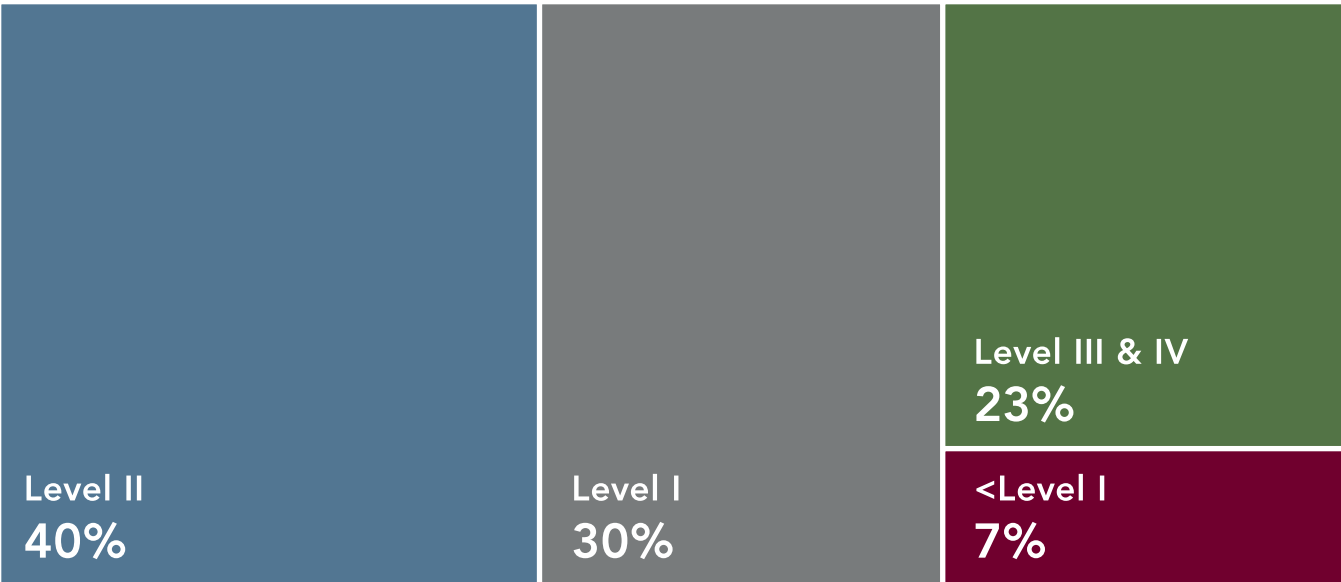
Montana Deliveries by Level of Maternal Care

As illustrated in Figure 6, in 2018, birthing people delivered at facilities across all levels of maternal care. Figure 6 includes deliveries occurring at birthing facilities that participated in the LOCATe Assessment. It does not include deliveries from the Indian Health Service hospital. Figure 6 shows the facility where the delivery occurred and does not account for where the obstetric care might have started and the transfer of care. In some instances, birthing people seek care at facilities without an obstetric unit. The data summarized in Figure 6 does not capture the full scope of obstetric care in the state. This information underscores the importance of facilities at each level of care in Montana’s maternal health system. The range of facilities across the state represents a unique strength of Montana’s rural health system. Improving the provision of risk-appropriate care involves strengthening each facility to have the skills, resources, and capacity to operate at the height of their level.

Figure 6. Montana Deliveries by Level of Maternal Care

Montana Deliveries by Level of Maternal Care, 2018 (N=10,339)

Birthing people in Montana delivered at facilities across all levels of maternal care



Source: Montana Discharge Data System and Montana LOCATe Assessment

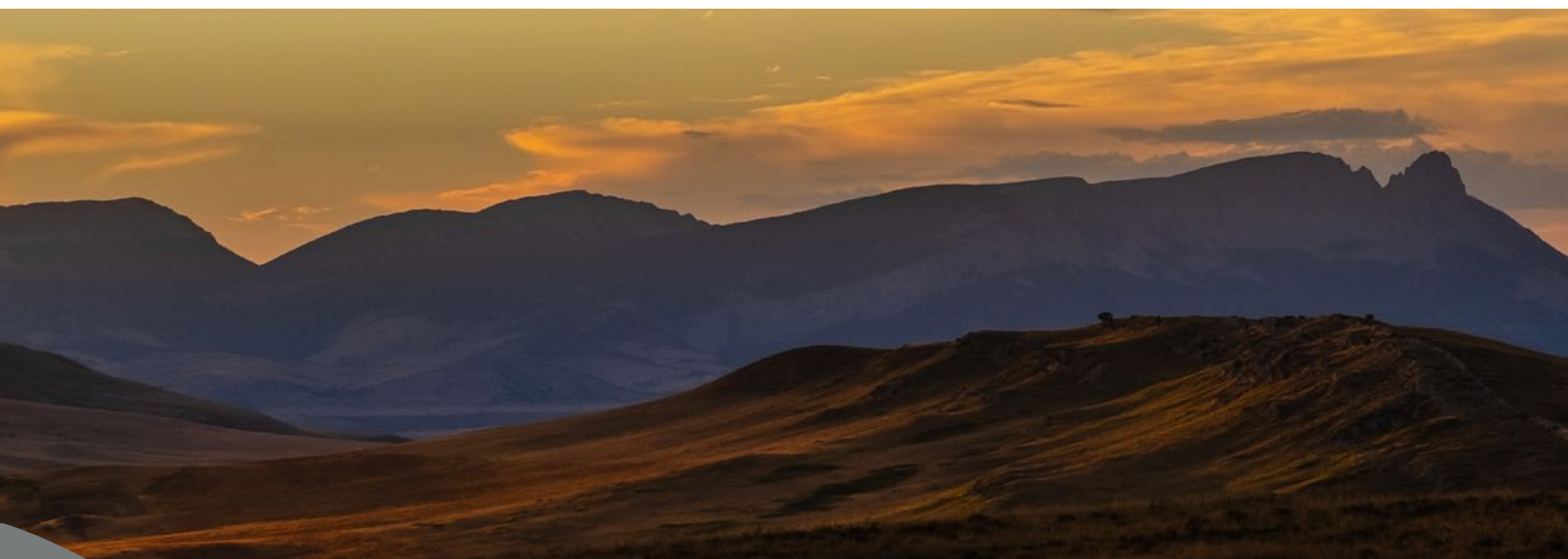
Transport

A well-functioning system of risk-appropriate care relies on solid transport protocols to ensure that at-risk maternal and neonatal patients receive care at a facility prepared to meet their needs [6]. A complex process, transport involves the assessment of the maternal and/or fetal condition and the capacity of the facility to address their needs [7].

As illustrated in Table 4, about a quarter (28%) of Montana birthing facilities receive neonatal transports. Of the facilities that LOCATe-assessed at Level II, a quarter (25%) receive neonatal transports and 100% of facilities that LOCATe-assessed at Level III receive neonatal transports.

Table 4. Neonatal Transport

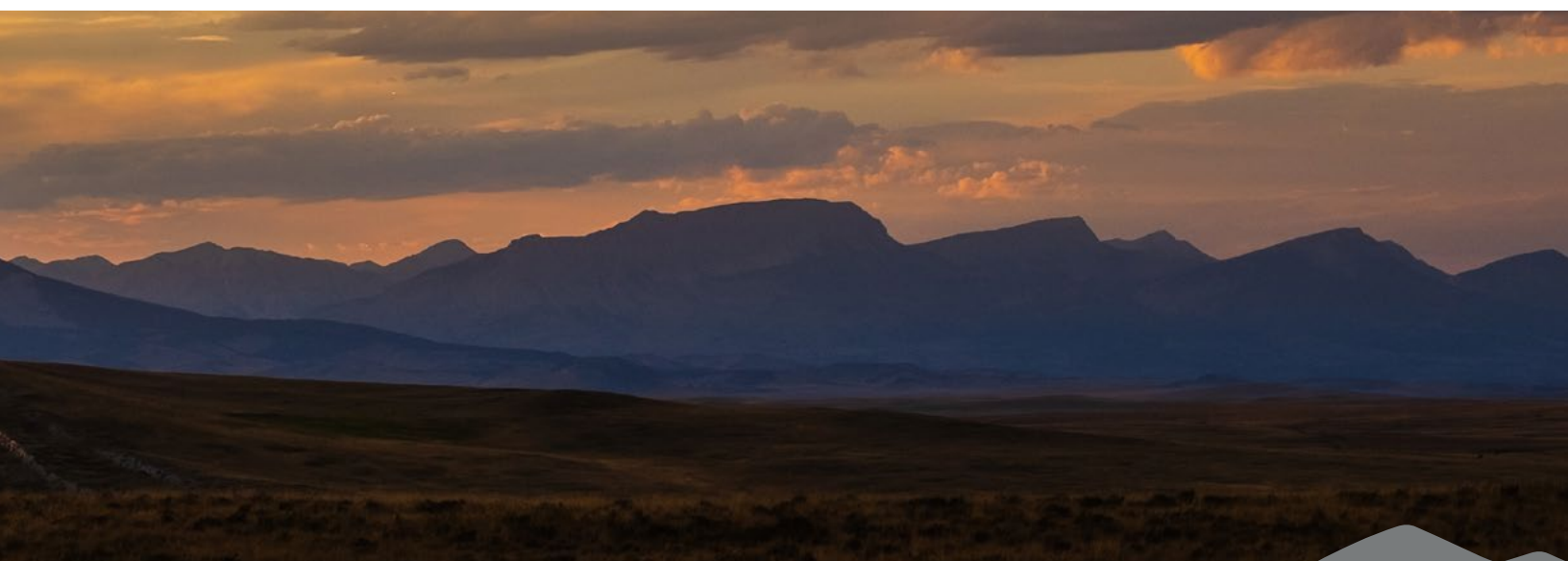
Neonatal Transport	Receive any neonatal transports n (%)		*Receive complicated high-risk neonates n (%)	*Receive convalescent neonates n (%)
Montana overall (N=25)	7 (28.0)	*Of the facilities that receive any neonatal transports	6 (86.0)	5 (71.0)
LOCATe-assessed Level I (n=12)	0		0	0
LOCATe-assessed Level II (n=8)	2 (25.0)		1 (50.0)	2 (100.0)
LOCATe-assessed Level III (n=5)	5 (100.0)		5 (100.0)	3 (60.0)



As illustrated in Table 5, 56% of facilities reported having a written plan for the transport of complicated obstetric patients. Nearly half (44%) do not have a written plan for the transport of complicated obstetric patients. Many of these facilities reported having a general transport plan but nothing specific to obstetric patients.

Table 5. Maternal Transport

Maternal Transport	Written plan for transport of complicated obstetric patients (any) n (%)		*Plan includes mechanism for maternal transport to higher-level facility available at all times n (%)	*Plan includes mechanism to facilitate and openly accept maternal transports from lower-level facilities n (%)
Montana overall (N=25)	14 (56.0)	*Of the facilities with a written plan for transport of complicated obstetric patients (any)	13 (93.0)	3 (21.0)
LOCATe-assessed <Level I (n=6)	2 (33.0)		2 (100.0)	0
LOCATe-assessed Level I (n=13)	9 (69.0)		9 (100.0)	0
LOCATe-assessed Level II (n=4)	1 (25.0)		0	1 (100.0)
LOCATe-assessed Level III (n=1)	1 (100.0)		1 (100.0)	1 (100.0)
LOCATe-assessed Level IV (n=1)	1 (100.0)		1 (100.0)	1 (100.0)



Maternal Care Protocols

LOCATe asks about the presence of two maternal care protocols. These protocols do not impact the determination of the level of care; however, having these protocols in place and practicing/drilling them can standardize health care processes. Minimizing variability by implementing standardized evidence-based practices can improve outcomes and quality of care [5].

As shown in Table 6, most (88%) birthing facilities have written policies and procedures for severe maternal morbidity events. Of these facilities, all have a policy for obstetric hemorrhage, and the vast majority (91%) have a policy for hypertensive emergencies. In the last 12 months, nearly three quarters (73%) of facilities had completed drills on obstetric hemorrhage, and 60% had drilled on hypertensive emergencies.

Table 6. Maternal Care Protocols

Protocols	Any n (%)	Obstetric Hemorrhage n (%)	Hypertensive Emergency n (%)
Written policy	22 (88.0)	22 (100.0)	20 (91.0)
Drill in the last 12 months	n/a	16 (73.0)	12 (60.0)

LOCATe gathers information on hospital preparedness, recovery, and response to emergency situations. As shown in Table 7, most (88%) birthing facilities practice disaster response drills. Of these facilities, 64% reported that the disaster response drills included the neonatal unit, and 68% reported the drills included the obstetric unit.

Table 7. Disaster Response Drills

Disaster Response Drills	n (%)
Any	22 (88.0)
Neonatal Unit	14 (64.0)
Obstetric Unit	15 (68.0)



Discussion

The following section outlines five recommendations regarding the provision of risk-appropriate care in Montana. Each recommendation includes supporting data and strategies for addressing the identified needs.

Recommendation 1: Perinatal Regionalization

Montana has 47 CAHs and 3 Indian Health Service (IHS) Hospitals spread across 43 mostly rural counties. The 2013 National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme [8] classifies counties into six levels based on population, as listed below. Montana has 5 metropolitan (small metro) counties and 51 non-metropolitan; 5 micropolitan counties, and 46 non-core counties, the most rural category.

METROPOLITAN

- **Small metro:** Metropolitan statistical area population less than 250,000.

NONMETROPOLITAN

- **Micropolitan:** Urban cluster population of 10,000 – 49,999.
- **Non-core:** Nonmetropolitan counties that did not qualify as micropolitan. The most rural areas.

CAHs serve a vital role in the health system by increasing access to care in rural and remote areas. Most (94%) of Montana's CAHs and IHS Hospitals reside in non-core counties, and 34 do not have an obstetrics unit. These facilities fill gaps in the system by providing obstetric services in communities without a birthing facility. Due to distance to care, birthing people in rural communities might seek care or deliver at a hospital without an obstetrics unit. LOCATe does not provide a comprehensive picture of Montana's perinatal care capacity, as it only includes the birthing facilities in the state. Due to the unique geographic landscape of Montana, addressing the challenges associated with rural obstetric care will require statewide coordination of all available perinatal care.

While perinatal regionalization has led to improved outcomes for birthing people and infants both domestically and internationally, the structure and strategies that work in one system might not meet the needs of another [9]. Each state must identify regionalization strategies that take into account the unique characteristics of the health system [9]. Community hospitals, state and local public health departments, and other relevant associations must review the LOCATe results alongside the broader maternal health system needs assessment and use this information to shape a coordinated system of care [9]. Such a system supports birthing people and health care teams to develop care plans for labor, transport, and emergencies [9].

RECOMMENDATION:

Ensuring birthing people receive care at a facility prepared to meet their needs will require statewide coordination of all available perinatal care. The MOMS program can act as a convener to organize meetings with facilities, DPHHS, MHA, and other maternal health stakeholders to review the needs assessment data, define specific perinatal care regions, and discuss ways to improve the system (e.g., transport, training, emergency protocols). Hospital leadership must encourage and support perinatal care providers to participate in these meetings. The MOMS program should facilitate discussions with hospitals (including those without an obstetrics unit) in each perinatal care region to develop strategies that meet the unique challenges posed by distance and resource scarcities in each area.



Recommendation 2: Cultivating formal and informal relationships across the perinatal health care system.

Montana's LOCATe-assessed levels for maternal care ranged from <Level I to Level IV. Most (76%) facilities LOCATe assessment placed them at Level I or lower. These results do not imply that the lower-level facilities provide less quality care. Rather, they highlight the importance of establishing relationships between facilities of different levels to support the provision of risk-appropriate care. [2]

A coordinated system relies on a shared understanding of the levels of care and criteria of high-risk conditions [5]. Within facilities, teams need protocols for standardized risk assessment and a plan to coordinate services and initiate a timely transfer as required [5]. Establishing and defining relationships facilitates consultation and transport so that low-risk birthing people can remain in their communities and those with higher risk can receive specialized care [2].

Education and training that includes facilities of different levels make up a core component of a regionalized system [2]. These learning

environments go both ways. The higher-level facilities can offer education and training on implementing clinical best practices. The smaller facilities can contribute their unique perspective and expertise on providing obstetric care in a rural setting. These efforts increase the quality of care and contribute to both formal and informal relationship building. MOMS has developed several programs and initiatives that foster a maternal health community of practice.

RECOMMENDATION:

The MOMS program should engage in education and training of providers that situates facilities within a cohesive statewide system of risk-appropriate care. MOMS can reinforce this message through learning communities such as Project ECHO, Simulation Leadership Academy, and the MPQC.

Recommendation 3: Maternal Transport Plans

Close to half (44%) of facilities that participated in LOCATe do not have a specific maternal transport plan. ACOG/SMFM recommends Level I and Level II facilities partner with higher-level facilities to establish a maternal transport plan and agreement to address patient needs when complications arise [2]. Transport is a critical component of risk-appropriate care as it provides the means to receive care at a higher-level facility [6,7].

All facilities must have the capacity to provide initial care, assess risk, and address common obstetric emergencies, including hemorrhage and emergencies related to hypertension, such as preeclampsia. Facilities need to clearly understand the types of conditions they can treat based on the resources and equipment at their facility and have a plan to initiate transport when required [2]. A well-defined transport policy also includes a plan for the back transport of convalescing neonates and birthing people [6]. Back transport allows previously critical infants and birthing

people to return to the lower-level facility in their community for ongoing care before discharge [6, 10]. Distance, harsh winters, and communities with limited obstetric care create barriers to providing risk-appropriate care and require additional planning and preparedness. The rurality of Montana and distance to a higher-level facility adds further complexities to arranging transport.

RECOMMENDATION:

All CAHs providing emergency obstetric services, <Level I, Level I, and Level II facilities should collaborate with higher-level facilities to develop and maintain obstetric-specific transport plans, per ACOG guidelines, and cooperative agreements to ensure safe, timely, and efficient transport of patients with risk factors and complications.





Recommendation 4: Enhancing Care through Evidence-Based Practice

Most facilities (88%) reported having a policy for two common severe maternal morbidity events, hemorrhage and emergencies related to hypertension. Seventy-three percent of facilities had completed a hemorrhage drill in the past 12 months, and 60% had completed a drill for addressing events related to hypertension. Having protocols in place and practicing/drilling them can standardize health care processes. Minimizing variability by implementing standardized, evidence-based practices can improve outcomes and quality of care [5].

A network of maternal and neonatal care providers, the MPQC aims to improve health outcomes for birthing people and infants. Montana became an AIM state in the fall of 2021. The MPQC has committed to implementing the AIM Patient Safety Bundles, which provide healthcare teams with a standard set of evidence-based practices to identify birthing people at high-risk and implement risk reductions strategies. All birthing facilities in the state received an invitation to join the MPQC and participate in its AIM Initiative. Seventeen facilities (65%) enrolled and began implementing the Obstetric Hemorrhage Bundle in the fall of 2021.

Through the maternal arm of the MPQC, participating facilities implement a change package modeled after the Institute for Healthcare Improvement (IHI) Model for

Improvement, which builds upon the basic tenets of Plan-Do-Study-Act (PDSA) cycles for quality improvement. Facilities receive support and guidance from clinical experts as they implement standardized, evidence-based approaches to address key factors of maternal morbidity and mortality. The core elements of the Obstetric Hemorrhage Bundle include implementing unit drills, hemorrhage risk assessment, measurement of cumulative blood loss, debriefs following cases with complications, and multidisciplinary system-levels reviews following cases of severe maternal morbidity.

In addition to standardizing approaches to care, participation in the MPQC provides a venue to build relationships and trust between birthing facilities. Strong relationships between facilities of different capabilities make up the core of a regionalized perinatal care system [9]. To strengthen the statewide system of care, Montana needs to engage all twenty-six birthing facilities in the AIM Initiative.

RECOMMENDATION:

The MPQC should recruit the nine remaining birthing facilities into cohort 2 of the AIM Obstetric Hemorrhage Bundle to enhance care through evidence-based practice.



Recommendation 5: Measure the Impact of Risk-Appropriate Care

Recommendations 1-4 include a series of evidence-based strategies to improve the provision of risk-appropriate care in Montana. Implementing a regionalized perinatal care system should decrease preventable severe morbidity and mortality and result in fewer cases of severe maternal morbidity at lower-level facilities [2]. Montana must build a structure of measurement and evaluation into the regionalized system of care to continually monitor activities and outcomes. The structure should reflect Montana's overall goals and activities regarding the provision of risk-appropriate care.



**Quality improvement
is about the right care,
in the right place, at the
right time."**

—Institute for Healthcare Improvement

RECOMMENDATION:

Facilities and state partners should develop a measurement strategy to evaluate the overall impact of risk-appropriate care activities on maternal and neonatal health in Montana. The Montana MMRC should formalize inquiry related to risk-appropriate care in each investigation of maternal death, following CDC guidelines.

Limitations of the LOCATe Assessment

Throughout the implementation of LOCATe in Montana, facilities brought forth several limitations of the ACOG/SMFM/AAP guidelines. These limitations provide an important perspective on providing risk-appropriate care in a rural setting.

LOCATe Cannot Formally Designate Levels of Care

To be uniform across states, LOCATe uses the ACOG/SMFM/AAP guidelines to classify facilities into maternal and neonatal care levels. CDC designed LOCATe as a self-assessment and not as a formal designating tool. A designating authority could make different determinations on criteria for levels of care based on characteristics such as the scope of practice differences at the state level. A formal designation would involve a much more in-depth process, including site visits or other methods for independent validation of data. The implementation of LOCATe in Montana seeks to start a conversation with facilities and stakeholders on the provision of risk-appropriate care.

Facilities Assessing at <Level I Maternal Care

Several facilities LOCATe-assessed at <Level I for maternal care. Obstetric ultrasound availability accounted for the most common reason facilities LOCATe-assessed at <Level I. Hospitals must have limited or standard obstetric ultrasound on-site and staffed 24/7 and interpretation services either on-site or remote. Most facilities reported having the equipment on-site but did not have adequate staffing to offer these services 24/7.

Montana-Specific Scope of Practice for Anesthesia Providers

Several facilities met all Level II and Level III maternal care requirements, aside from anesthesia provider availability. For Level II, ACOG guidelines state that a physician anesthesiologist needs to be “readily available at all times.” For Level III, ACOG guidelines state that a physician anesthesiologist needs to be “physically present at all times.” In Montana, Certified Registered Nurse Anesthetists (CRNA) can practice independently. Rural facilities may have at most one physician anesthesiologist, with CRNAs independently providing most anesthesiology care. Staff from several participating facilities felt that CRNAs “readily available at all times” should meet the Level II anesthesia provider requirement given their independent scope of practice in Montana.

Access to Maternal-Fetal Medicine (MFM) Specialist

Several Montana facilities met all the Level II maternal care requirements aside from the MFM provider availability. ACOG guidelines define “readily available at all times” as the specific person should be available 24 hours a day, 7 days a week for consultation and assistance, and able to be physically present on-site within a time frame that incorporates maternal and fetal, or neonatal risks and benefits with the provision of care. The rurality of Montana creates barriers to meeting this requirement for several provider types. Often, rural facilities can get a specialty provider (e.g., Maternal-Fetal Medicine Specialist) on the phone or via telemedicine 24/7, but due to the distance between communities, they cannot physically travel to the facility in a timely manner.



Conclusion

Improving risk-appropriate care in Montana will require commitment from providers, hospital administration, state and local health departments, and professional associations. We recommend that facilities and maternal health stakeholders use this report to work together to identify barriers to risk-appropriate care and strategies to enhance perinatal regionalization in Montana. Improving coordination across the system increases the ability of birthing people to deliver in their communities while providing support for complex and emergent situations—ultimately shaping a maternal health system that meets the unique needs of Montana.

References

- [1] "Guidelines for Perinatal Care, 8th edition [Paperback] - AAP." <https://shop.aap.org/guidelines-for-perinatal-care-8th-edition-paperback/> (accessed Dec. 12, 2021).
- [2] S. J. Kilpatrick, M. K. Menard, C. M. Zahn, and W. M. Callaghan, "Obstetric Care Consensus #9: Levels of Maternal Care," *American Journal of Obstetrics and Gynecology*, vol. 221, no. 6, pp. B19–B30, Dec. 2019, doi: 10.1016/j.ajog.2019.05.046.
- [3] A. Catalano et al., "Implementing CDC's Level of Care Assessment Tool (LOCATe): A National Collaboration to Improve Maternal and Child Health," *J Womens Health (Larchmt)*, vol. 26, no. 12, pp. 1265–1269, 2017, doi: 10.1089/jwh.2017.6771.
- [4] The National Foundation March of Dimes, "Toward improving the outcome of pregnancy: Recommendations for the regional development of maternal and perinatal health services.," 2010. [Online]. Available: <https://www.marchofdimes.org/toward-improving-the-outcome-of-pregnancy-iii.pdf>
- [5] L. R. Van Otterloo and C. D. Connelly, "Risk-Appropriate Care to Improve Practice and Birth Outcomes," *J Obstet Gynecol Neonatal Nurs*, vol. 47, no. 5, pp. 661–672, Sep. 2018, doi: 10.1016/j.jogn.2018.05.004.
- [6] E. M. Okoroh, C. D. Kroelinger, S. M. Lasswell, D. A. Goodman, A. M. Williams, and W. D. Barfield, "United States and territory policies supporting maternal and neonatal transfer: review of transport and reimbursement," *Journal of Perinatology*, vol. 36, no. 1, pp. 30–34, Jan. 2016, doi: <http://dx.doi.org.weblib.lib.umt.edu:8080/10.1038/jp.2015.109>.
- [7] C. L. DeSisto, R. Oza-Frank, D. Goodman, E. Conrey, and C. Shellhaas, "Maternal transport: an opportunity to improve the system of risk-appropriate care," *J Perinatol*, vol. 41, no. 9, pp. 2141–2146, Sep. 2021, doi: 10.1038/s41372-021-00935-9.
- [8] D. D. Ingram and S. J. Franco, "2013 NCHS Urban-Rural Classification Scheme for Counties," *Vital Health Stat 2*, no. 166, pp. 1–73, Apr. 2014.
- [9] S. N. Kunz, C. S. Phibbs, and J. Profit, "The changing landscape of perinatal regionalization," *Semin Perinatol*, vol. 44, no. 4, p. 151241, Jun. 2020, doi: 10.1016/j.semperi.2020.151241.
- [10] S. L. Bourque, C. Levek, D. L. Melara, T. R. Grover, and S. S. Hwang, "Prevalence and Predictors of Back-Transport Closer to Maternal Residence After Acute Neonatal Care in a Regional NICU," *Matern Child Health J*, vol. 23, no. 2, pp. 212–219, Feb. 2019, doi: 10.1007/s10995-018-2635-6.

Appendix A

Methodology

Instrument

Montana implemented version 9.2 of the LOCATe assessment. LOCATe includes questions about facility services and their availability, facility personnel and their availability, volume of services, drills and protocols for maternal emergencies, transport, facility-level statistics, and self-reported levels of care.

Participants

All birthing facilities in Montana received an invitation to participate in the LOCATe initiative. The Montana LOCATe team sent a letter to the Administrator, Director of Nursing, and Quality Improvement Coordinator introducing LOCATe and requesting the facility identify a LOCATe champion to lead efforts at their facility. The LOCATe champions attended a kickoff webinar on July 23, 2021.

Survey Administration

The data collection occurred from July 23, 2021, to October 31, 2021. Of the 26 birthing facilities in the state, 25 (96%) participated. LOCATe champions received an email with instructions and the online survey link. The LOCATe team administered the assessment instrument through the REDCap platform. The survey remained open for 14 weeks, and participants received email reminders and follow-up calls throughout the recruitment period. Once CDC provided preliminary results, the LOCATe team completed a data validation process with all facilities. This process occurred from November 15, 2021, to December 17, 2021. During this process, facilities reviewed their preliminary results and made any necessary updates as needed and confirmed data accuracy.

Data Analysis

The Montana LOCATe team sent the data to CDC for analysis. CDC developed an algorithm for assessing the maternal and neonatal level of care. The algorithm utilizes a scoring system for each of the questions that refer directly to staffing and service specifications in the ACOG/SMFM/AAP guidelines. Each question is scored with equal weight, and an overall maternal and neonatal level of care is provided for each participating facility. Upon completing the analysis, CDC shared the results with the Montana LOCATe team.

Limitations

One individual served as the LOCATe champion and completed the assessment on behalf of the facility. If the LOCATe champion did not engage other obstetric team members, the responses could reflect their knowledge of the facility's services and might not be comprehensive. LOCATe includes a set of detailed instructions and definitions. Respondents that do not thoroughly read these instructions might answer the questions based on their own interpretation leading to incorrect information.



