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# Maternity care access, quality, and outcomes: A systems-level perspective on research, clinical, and policy needs

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ABSTRACT

The quality of maternity care in the United States is variable, and access to care is tenuous for rural residents, low-income individuals, and people of color. Without accessible, timely, and high-quality care, certain clinical and sociodemographic characteristics of individuals may render them more vulnerable to poor birth outcomes. However, risk factors for poor birth outcomes do not occur in a vaccum; rather, health care financing, delivery, and organization as well as the policy environment shape the context in which patients seek and receive maternity care. This paper describes the relationship between access and quality in maternity care and offers a systems-level perspective on the innovations and strategies needed in research, clinical care, and policy to improve equity in maternal and infant health.



## Introduction

Maternal morbidity and mortality have been rising in the United States, nearly doubling during the past 25 years.[1–3] Increases in childbirth-associated morbidity and mortality have been accompanied by restricted access to care for some groups[4,5] alongside rising rates of obstetric intervention without clear medical need.[6–8] Clinical strategies have begun to reverse these trajectories.[9–11] However, clinicians providing care during pregnancy and birth as well as their patients deserve a system of health care delivery, financing, and organization that supports evidence-based decision-making and adoption of emerging clinical guidance around maternity care access and management.

Clinicians can only influence outcomes for the patients who come to the hospital, clinic, or birth center, and the direct sphere of influence that clinicians have is generally limited to medical guidance and clinical services. Improving the outcomes of maternity care requires that policymakers, researchers, and health care delivery systems beyond clinical care support patients and clinicians in adopting evidence-based strategies that foster healthy pregnancy and childbirth. That is, patients must be able to get in the door for care and once they arrive, receive the necessary services, no more and

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no less. Having access to the right care at the right time is a key component of quality. Access and quality are the two major issues affecting how clinicians can influence maternal and infant health outcomes. In addition, multiple other factors—and the intersection of these factors—affect need for, access to, quality, and outcomes of maternity care. These factors include clinical conditions, health insurance coverage, geographic location (rural or urban), and sociodemographic characteristics including race and ethnicity. To move toward the broad goal of equity in pregnancy and childbirth outcomes, this paper describes the relationship between access and quality in maternity care and offers a systems-level perspective on the innovations and strategies needed to achieve equity in research, clinical care, and policy.

## Rising rates of morbidity and mortality and troubling disparities

Most patients enter pregnancy without anticipating major risks to their health. Yet every year at least 50,000 experience potentially life-threatening complications of childbirth.[1,2] Such complications include the need for blood transfusion, acute renal failure, shock, acute myocardial infarction, respiratory distress syndrome, and aneurysms.[1] Moreover, the rate of severe maternal morbidity doubled between 1998 and 2011,[2] as did maternal mortality between 1990 and 2013.[2,3] These trends raise concern for maternal health given that perinatal morbidity may affect a woman's immediate recovery (e.g., symptomatic anemia) and long-term physical health (e.g., risks related to cesarean) as well as her mental health (e.g., depression).[12,13] The United States is the only developed nation in the world with a rising maternal mortality rate. It ranks 60th in the world in maternal survival after childbirth. In 2013, 18.5 maternal deaths per 100,000 live births were reported in the United States, up from 12.4 in 1990.[3] Rates are widely acknowledged to be unacceptably high.

Not only does the United States compare poorly in an international context, but averages do not convey the long-standing racial and ethnic disparities in maternal and infant mortality. In the United States, black women and infants are 2–3 times more likely to die during childbirth as white women and infants, an appalling disparity that cannot be explained by differences in socioeconomic status. It is a gap that has remained unchanged for decades.[14,15] Disparities between rural and urban United States settings are also striking, with rural women suffering worse health outcomes and more limited access to health care services than urban women.[4,16,17] Recent findings point to hospital-level differences in the quality of obstetric care at rural hospitals[18,19] and at black- and Hispanic-serving hospitals.[20,21]

## Access to maternity care

The first step toward achieving health equity in childbirth is to ensure that all patients have access to timely and appropriate care at all stages throughout their pregnancy, birth, and postpartum period. Access to maternity care is multifaceted and starts with early (first trimester) prenatal care.[22] Data from the 1970s and 1980s informed today's clinical standards, with evidence associating early and ongoing prenatal care with improved health outcomes, including lower rates of preterm birth and low birth weight.[22] Although access to early prenatal care is important,[23] it alone is not enough to ensure equitable birth outcomes.[24] More recent data reflect variability across subgroups of women in the association between prenatal care and improved birth outcomes, with adolescents seeing more consistent benefit,[23] and poor outcomes in perinatal mortality persisting for women of color, compared with white women, even with early access to prenatal care.[24]

Equitable maternity care access also must include appropriate and timely labor and delivery care, access to emergency obstetric care, and ongoing postpartum care, each of which are also crucial to maternal and infant health outcomes. However, there are significant barriers to accessing timely maternity care across all stages of pregnancy, birth, and the postpartum period. These barriers include financial and other structural and sociodemographic barriers, such as insurance status and geographic location.[25] Particularly for members of racial and ethnic minority groups, perceived discrimination and past experiences of discrimination when accessing health care services may inhibit care-seeking, including during the prental period.[26,27] Further, psychological and interpersonal concerns, such as not wanting others to know about a pregnancy, can inhibit access, especially early in the prenatal period.[28] Each of these barriers requires its own set of solutions and is deserving of policy, research, and clinical attention.

In the United States and around the globe, access to all levels of maternity care is also influenced by health systems, payment schemes, and availability of a well-trained maternity care workforce.[29,30] One proposed solution for addressing access issues is to broaden the scope of who can perform particular services; for example, training nurses to provide anethesia care.[30] Currently, states vary in their scope of practice laws related to care and in the associated differences in the supply and organization of their maternity care workforce.[16,31] Beyond the workforce, it is also necessary to have a physical space and the needed supplies with which to provide obstetric care.[29,30,32] However, numerous obstetric units have closed in recent years.[33] Although closings have occurred in both urban and rural communities, they have disproporionately affected rural areas[34] and differentially hinder access in communities with lower average incomes and an already limited health care workforce supply.[35] Closures of obstetric units not only affect access, but may also affect outcomes, including perinatal mortality.[33]

## Variability in maternity care quality

The clinical evidence base in obstetrics is advancing rapidly. Yet, there are often long lags in translating this knowledge into clinical practice. For example, evidence regarding the harms of early-term elective delivery first surfaced in the 1970s and was validated by an abundance of studies

during subsequent decades. Yet the evidence was not widely translated into changes in practice until 40 years later.[36] In fact, early elective delivery rates more than doubled in the 1990s.[37] In recent years, conditions have improved (with a decline in the early elective delivery rate) following concerted efforts by health plans, professional societies, advocacy organizations, health care delivery systems, and hospital associations. However, implementation has been uneven at the hospital level.[8,38,39] Additionally, the widespread measurement and application of quality metrics for early elective delivery lagged decades behind evidence of its harms. The adoption of clear measures and "hard stop" policies have had the greatest impact on reducing early elective delivery rates, but their adoption has been inconsistent until recent years.[8,39]

Hospitals vary substantially in outcomes and processes of obstetric care.[40–43] Recent work has demonstrated 5-fold variation in hospital-level rates of maternal complications during delivery[41] and 10-fold variation in hospital cesarean rates.[43] These and other emerging examples of hospital-level variability in obstetric outcomes demonstrate that hospital factors (e.g., teaching status, and hospital geography) affect both utilization and patient outcomes of care.[42,44–46] However, these traditionally examined hospital characteristics explain very little of the between-hospital variation in utilization and outcomes, and an emerging body of literature demonstrates that current quality indicators also do not explain this wide variation in maternal outcomes.[47] Gaining a greater understanding of the causal factors behind this variability is an important goal for future research and systems change.

## Both access and quality affect outcomes of care

Neither access to care nor high-quality care alone ensures good outcomes in childbirth. Rather, the combination of timely access and appropriate, quality care is necessary for effective maternity care. Because access and quality interact, and because multiple factors affect both access and quality, the proposed solutions are necessarily multifaceted and differ dramatically by geography. In urban areas, experts have recommended that low-performing hospitals close their obstetric units or close the hopsital entirely.[48] In rural areas, the National Rural Health Association (NRHA) has led a "#SaveRural" campaign to urge policymakers to support hospitals in remaining open.[49]

These two approaches have vastly different implications for patient care. One the one hand, differences in hospital quality and characteristics are associated with racial disparities in obstetric outcomes,[50] and every effort should be made to ensure that all patients, regardless of sociodemographic characteristics, have access to the highest quality care possible. On the other hand, closing an obstetric unit or hospital in a rural area has greater ramifications than closing one in an urban area, where the next closest hospital may still be reasonably accessible.[51] More broadly, however, access to and quality of maternity care are related to the social determinants of health. Ensuring equitable outcomes for women, infants, and their families will require more than just addressing hospital differences in access to and quality of care. Instead, truly working toward equity requires combating structural barriers to good outcomes, including systemic racism, poverty, and socioeconomic hierarchies.[5,51–53]

## Systems-level approaches to improving maternity care

To improve quality and equity in United States maternity care, we recommend attention to solutions in four broad categories: risk-based triage of care during pregnancy, labor, and delivery; maternity care quality measurement; recognition of both medical and nonmedical aspects of childbirth; and disrupting the pathways between social determinants of health and birth outcomes.

### *Category 1: risk-based triage of care*

The move toward risk-based triage of care began in the 1970s with the regionalization of perinatal care and the development of coordinated referral systems to ensure access to facilities with the capacity to care for complex patients.[54] In the field of perinatal care, regionalization was led by a focus on neonatal care capacity, and neonatal levels of care designations that preceded, by decades, similar attention to obstetric care capacity.[54] In 2015 the American Congress of Obstetricians and Gynecologists (ACOG) and the Society for Maternal-Fetal Medicine (SMFM) announced uniform designations for levels of maternity care that encouraged clarity in the specific capacities of different facilities providing obstetric care.[55] The ACOG/SMFM consensus statement marks the first coordinated effort to address the need for appropriate triage of pregnant patients with particular health conditions to settings where their clinical needs can be met. However, to achieve these goals, further action is needed by researchers, clinicians, and policymakers to fully operationalize maternal levels of care. As yet, the maternal levels of care guidance are not underpinned by a strong epidemiologic or policy evidence base, but such a research agenda should be forthcoming to inform ongoing implementation of risk-based triage of care.

### *Category 2: measuring maternity care quality*

Innovation in measuring maternity care quality is timely and necessary.[56] Recently, professional societies (including ACOG and SMFM) and national research institutions such as the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) have recommended reporting the rates of nonmedically indicated cesarean delivery, nonmedically indicated induction, labor arrest or failed induction diagnosed without meeting accepted criteria, and cesarean deliveries for nonreassuring fetal heart rate by NICHD category.[6,7,57] Other groups have developed and endorsed indicators of maternity care quality, including the Joint Commission's perinatal care core measures,[58] the National Quality Forum's endorsed measures list,[59] and the Agency for Healthcare Research and Quality's inpatient quality indicators (IQI 21 and IQI 33).[60] Despite the growth in potential measures, clarity is lacking about how quality measures

should be reported (e.g., hospital level, provider group level, or clinician level) and to whom the information should be made available. Specific suggestions for addressing these questions are described in the sections below on research, clinical, and policy strategies.

### *Category 3: recognizing both medical and nonmedical aspects of childbirth*

Recognition of the nonmedical aspects of childbirth is vital to moving toward a systems-level approach to improving qualty and equity in maternity care. Childbirth is a deeply personal, cultural, social, emotional, and spiritual event as much as it is an experience of medical care.[61,62] In her book, obstetrician-ethicist Anne Lyerly explains that, "birth is a source of *meaning*." She goes on to state that "It is a big piece of how birth matters to women…a way to claim (or reclaim) a sense of power" (19).[61] The medical aspects of childbirth are often viewed as playing a role in diminishing or having a negative impact on the "meaning" of childbirth, particularly for indivduals from marginalized communities (e.g., racial and ethnic minority, rural, etc.). Recognizing the nonmedical elements of childbirth and understanding the role that nonmedically focused support might play in nurturing them may improve quality and equity in maternity care.

For example, having support from a doula may help to uphold the core values that pregnant individuals hold and the goals they hope to achieve during the birthing process. Doulas are trained professionals who provide physical, emotional, and educational support to mothers before, during, and immediately after childbirth, often providing the nonmedical support during childbirth that may facilitate the type of "good birth" that Dr. Lyerly describes. In addition, a body of work has determined that support from a doula during labor and delivery is associated with lower cesarean rates and fewer obstetric interventions, fewer complications, less pain medication, shorter labor hours, and higher infant APGAR scores. It also shows potential for reducing racial, ethnic, and socioeconomic disparities in breastfeeding initiation.[63–67] In addition to support during labor and delivery, a doula's work often includes prenatal psychosocial support, education, and health promotion. This type of care may be associated with lower risk of preterm birth and reductions in the chance of cesarean.[66,68] Another recent study demonstrates that doulas can influence the pathways between social determinants and birth outcomes by addressing some of the underlying social and psychosocial issues such as social support that evade clinical approaches to reducing persistent disparities.[69] Embedding nonmedical support like doula care into maternity care delivery systems will likely improve outcomes, satisfaction, and quality. It may also reinforce positive relationships and disrupt negative associations between social determinants of health and birth outcomes.[69]

### *Category 4: social determinants of health and birth outcomes*

There is absolutely no biological justification for the sociodemographic disparities in current maternity care outcomes. Rather, at their core, disparities are the result of social determiants of health, which pattern in inequitable, unjust, and unconscionable ways the access to and quality of care that pregnant patients and their infants receive.[5] Truly working toward equity in maternity care outcomes will require disrupting the deeply entrenched pathways between the social determiants of health and poor birth outcomes. Doing so will not be easy, but solutions have already been proposed that can move us forward, several of which we describe below as Research Directions, Clinical Efforts, and Policy Strategies.

## Research directions

Gaps in an understanding of the broader systems and policy context constrain clinical efforts to improve maternity care quality and equity. We recommend strategies for addressing research needs in each of the four categories described above.

First, although the initial maternal levels of care consensus statement represents an important first step, it is predominantly based on expert opinion. Maternal levels of care must be empirically examined, and research that studies location of childbirth and outcomes of care should contribute to ongoing development and refinement of the levels of care. This research should also include attention to differences between rural and urban contexts.[70]

Second, research on the drivers of variability in quality is needed to inform efforts to reduce that variability. Specifically, we recommend research on variability in obstetric procedure utilization and maternal outcomes of care by exploring hospital management practices that explain variation in other areas of medicine.[46,71–73]

Third, to better understand and integrate the nonmedical aspects of care into broader efforts to improve maternity care quality and equity, we recommend modifying current quality measures to include patient perspectives and aspects of quality that extend beyond the clinical experience. Pregnant individuals seek five things before, during, and after childbirth: agency, personal security, connectedness, respect, and knowledge.[61] These themes emerged from an extensive qualitative analysis of childbirth experiences and should inform the current development of quality standards to which clinicians, hospitals, clinics, birth centers, health plans, and others are held. Explicit integration of patient experiences and patient values into quality measures may cast a wider net of understanding of quality, as would an operational definition of equity as a component of quality. In addition, research on the patient experience and nonmedical aspects of care is crucial to informing clinical efforts to improve quality. Such efforts are feasible, as demonstrated by nursing home resident-reported quality of care measures that are now publicly reported.[74]

Finally, for research to be effective and equitable, we must center at the margins. This will require deep introspection by clinicans and researchers alike in rethinking what we consider to be the norm. That is, we must understand the norm for groups at the margins (e.g., rural communities or racial and ethnic minority groups) and how, for example, quality of care might differ through those different lenses.[53]

## Clinical efforts

Clinical efforts aimed at improving maternity care quality and equity also require attention in these four areas.

First, maternal levels of care must be fully operationalized —baked into the fabric of perinatal regionalization. Those engaged in implementing maternal levels of care designations must expand beyond obstetrics to include family medicine, midwifery (including out-of-hospital midwives), anesthesia, emergency medicine, nursing, and hospital administration. In addition, clinics must work to ensure appropriate referrals based on clinical needs and hospital capacity or levels of care. This will require facilitites to collaboarate to develop and maintain cooperative agreements that will allow for the management of health care needs of pregnant individuals who develop complications.[70,75]

Efforts to improve the reporting and availability of group and clinican-level data on quality are needed. For example, research on variability in obstetric procedure use and maternal outcomes of care may yield important information about how the broader systems and policy context constrain clinical efforts to improve maternity care quality and equity. There are also few established measures of obstetric or perinatal quality endorsed by national agencies such as the National Quality Forum, which presents challenges for both measurement and improvement. Many clinicians may be unaware of their own performance on quality metrics, highlighting the need for feedback loops that ensure clinicans receive their own data as well as guidance if needed in how to make changes, incorporate feedback, and modify practice.[76]

A broader recognition of the nonmedical aspects of birth may include adding doulas or other support professionals to the birth team. Obstetricians, recognizing the benefits of nonmedical support provided by doulas, are at the forefront of efforts to increase access to doula care, noting in an ACOG/SMFM consensus statement on cesarean birth that doula support is a resource that is "underutilized."[7] Doulas can play an important role in supporting pregnant individuals outside the scope of clinical services, and they can provide care that is highly complementary to that offered by obstetricians, midwives, family physicians, and nurses.[69] Some evidence also suggests that doulas play an important role in improving the clinical encounter for pregnant individuals who have historically experienced discrimination in the health care system.[77]

Patient identity and its connection to contemporary and historical contexts of racism and discrimination may seem outside the scope of clinical practice, but maternity care clinicians have a responsibility to play a role in dismantling racism through self-education and a shift in perception and practice.[53] Clinical efforts to improve the quality of care must stand on a foundational belief that clincians wield power, privilege, and a responsibility for creating equity in obsetetrics.[5] To that end, efforts must focus not only on understanding the United States's history of racism and how the country's historical notions about race shaped scientific research and clinical practice, but also on shifting the field's viewpoint from a majority group's perspective to that of the marginalized group or groups.[53] Recently, the Alliance for Innovation on Maternal Health created a bundle, a small, straightforward set of evidence-based practices, for reducing racial and ethnic disparities in peripartum care that offers specific, actionable recommendations for clinicians to address the broad challenge of confronting and overcoming racism in maternity care.[78]

## Policy strategies

First, to fully account for all birth settings in the United States, maternal levels of care should be expanded to include the home setting, where a growing number of births occur.[79] The lack of recognition of home birth within the levels of care designations places it outside the systems and structures that provide for access and quality in maternity care. As such, the noninclusion of home as a setting for childbirth may unecessarily exacerbate risks that could be mitigated by better information exchange, care integration, and referral patterns, such as those that characterize health systems in the United Kingdom, Canada, and the Netherlands.[80–85]

Second, improving quality measurement and reporting requires policy changes. There are examples of quality reporting based on hospital rates,[86] including New York State Public Health Law: Section 2803-j, which requires public reporting of a range of maternity-related statistics at the hospital level. Quality measures are also reported by provider groups, as in the 2012 Health Care Quality Report by Minnesota Community Measurement, which provided information on low-risk cesarean rates by provider group.[87] Also, most quality metrics report averages, not variability, and if the data are available, the interquartile ranges, minimum and maximum values, and other measures of dispersion should be available to inform efforts to address trajectories and reduce variability in the quality of care.[43]

Addressing the nonmedial aspects of birth through policy may connect with quality measurement through the use of patient-reported outcomes and the incorporation of patient experience into quality metrics, as described above. Another concrete policy action that flows from the data on doula support is to allow health insurance to cover doula services, which may lower the financial barriers to access.[65,66] Oregon and Minnesota allow Medicaid coverage of doula services, and there is a clear ethical, financial, and equity rationale for doing so.[88] However, implementation barriers are substantial and require attention to payment rates, provider enrollment processes, reimbursement requirements, distribution and diversity of workforce, and communication.[89]

Finally, racial, geographic, and insurance-based disparities in maternity care access and outcomes are unacceptable and must be reversed by, for instance, centering at the margins, diversifying the workforce, and engaging with communities.[5,53] In rural areas, policymakers can evaluate workforce scope of practice laws and training programs with the intention of improving access to high-quality care.[90] In addition, Medicaid, which pays for nearly one-half of all births nationwide offers a unique opportunity to improve access to care for low-income pregnant patients by facilitating access to all levels of maternity care and by emphasizing quality improvement activities.[91,92]

## Conclusion

Maternity care in the United States needs attention to access, quality, and equity. Available quality metrics vary widely across hopsitals, and access to care is tenuous for rural residents, low-income individuals, and people of color. Beyond

the individual clinical and sociodemographic characteristics that may render pregnant individuals more vulnerable to poor outcomes, health care financing, delivery, and organization as well as the policy environment shape the context in which patients seek and receive maternity care. Innovations in research, clinical care, and policy are needed to improve access, quality, and equity in maternal and infant health.

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