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Improving hospital quality to reduce disparities in severe maternal morbidity and mortality

Elizabeth A. Howell, MD, MPP[a,b,*], *and Jennifer Zeitlin, DSc, MA*[a,c]

[a]*Department of Population Health Science & Policy, Icahn School of Medicine at Mount Sinai, New York, NY*
[b]*Department of Obstetrics, Gynecology, and Reproductive Science, Icahn School of Medicine at Mount Sinai, New York, NY*
[c]*Inserm UMR 1153, Obstetrical, Perinatal and Pediatric Epidemiology Research Team (Epopé), Center for Epidemiology and Biostatistics Sorbonne Paris Cité, DHU Risks in pregnancy, Paris Descartes University, Paris, France*

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ABSTRACT

Significant racial/ethnic disparities in maternal morbidity and mortality exist in the United States. Black women are 3–4 times more likely to die a pregnancy-related death as compared with white women. Growing research suggests that hospital quality may be a critical lever for improving outcomes and narrowing disparities. This overview reviews the evidence demonstrating that hospital quality is related to maternal mortality and morbidity, discusses the pathways through which these associations between quality and severe maternal morbidity generate disparities, and concludes with a discussion of possible levers for action to reduce disparities by improving hospital quality.

Introduction

Racial/ethnic minorities suffer a disproportionate number of maternal deaths as well as other adverse obstetric and perinatal outcomes.[1,2] National data has documented that black women are 3–4 times more likely to die from pregnancy-related causes than white women. This represents the largest disparity among all the conventional population perinatal health measures.[2] Disparities are even more marked in New York City where recent data demonstrates a 12-fold higher risk of pregnancy-related death for blacks than whites.[3] Maternal mortality is also elevated among some Native Americans/Native Alaskans, Asians/Pacific Islanders, and for certain subgroups of Latino women including Puerto Ricans.[4–6] For every maternal death, 100 women suffer a severe obstetric morbidity, a life threatening diagnosis or undergo a lifesaving procedure during their delivery hospitalization.[7] Racial and ethnic disparities also exist in rates of severe maternal morbid events.[8]

A number of pregnancy complications and comorbidities associated with maternal death are more common among minorities than whites. Blacks experience higher mortality from hemorrhage, hypertensive disorders of pregnancy, and cardiomyopathy while Hispanic women have an increased risk of death due to hypertensive disorders.[4,9] Minority women have been found to have both higher prevalence and higher case-fatality rates for these disorders and for more common problems such as diabetes. A national study which investigated pregnancy-related mortality among black versus white women found that black women had a case-fatality rate 2.4–3.3 times higher than that of white women for five specific pregnancy complications including pre-eclampsia, eclampsia, abruptio placentae, placenta previa, and postpartum hemorrhage.[10]

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* *Corresponding author at*: Elizabeth A. Howell, MD, MPP, Department of Population Health Science & Policy, Icahn School of Medicine at Mount Sinai, One Gustave L. Levy Place, Box 1077, New York, NY 10029, NY
E-mail address: elizabeth.howell@mountsinai.org (E.A. Howell).

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A great deal of attention has focused on the role of social determinants of health and their contribution to adverse maternal and perinatal outcomes. Poverty, lack of education, poor nutritional status, smoking, and neighborhood have been associated with poor maternal and infant outcomes.[11] Living in an area of higher crime, neighborhood deprivation, or concentrated poverty can impact both maternal health status and the ability to access certain providers for pregnancy and delivery care.[12] Our ability to intervene on these factors in the hospital has been limited. But their contribution to overall maternal morbidity and mortality must be considered and addressed.

The quality of care provided during the delivery hospitalization may be more amenable to change. Research has demonstrated that provider and system failures explain a significant proportion of maternal deaths and near-misses raising the possibility that better hospital quality could improve maternal outcomes and reduce disparities. Figure 1 provides a broad overview of factors that may contribute to pathways linking hospital organization and quality to disparities in maternal morbidity and mortality.

To assess whether improving hospital quality may be an effective strategy to reduce disparities in maternal mortality and morbidity, we asked three questions: what is the evidence that hospital quality is related to maternal mortality and morbidity? Through which pathways could associations between quality and adverse maternal outcomes generate disparities between racial and ethnic groups? And, what levers are there for action to reduce disparities by improving hospital quality?

Hospital quality and severe maternal morbidity and mortality

What is quality and which components of quality impact maternal morbidity and mortality?

The Institute of Medicine defines healthcare quality as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and care consistent with current professional knowledge."[13] Many government agencies and professional bodies have developed quality measures with the goal of detecting suboptimal care based on the traditional Donabedian model,[14] which assesses structure, process, and outcomes. Structural measures are generally applied to characteristics of the care provider including hospitals (e.g., teaching status) or physicians (e.g., board certification). Process measures focus on delivery of specific interventions and services such as medications or procedures. Outcome measures provide information on health outcomes such as mortality, morbidity, and patient experience. Organizational factors including leadership, communication between health providers, and the existence of audit and feedback procedures have been a more recent focus of research on healthcare quality.[15,16]

Figure 2 schematizes the structural, organizational and clinical process characteristics that have been associated with health outcomes in research on quality of hospital care in other areas of medicine. For instance, there is a large body of research linking structural hospital characteristics to better neonatal outcomes for very low-birth-weight (VLBW) infants, including designation as a level III neonatal nursery, higher neonatal intensive care unit (NICU) volume, and higher VLBW birth volume.[17,18] Neonatal outcomes have also been associated with neonatologist-to-house staff ratio, training, workload, and capacity.[19–21]

A growing body of research suggests that organizational factors are associated with high-performing hospitals. For example, research on anterior myocardial infarction mortality and hospital care have identified a number of organizational factors that distinguish high-performing versus low-performing hospitals. Hospitals with greater improvement in beta blocker use over time demonstrated the following 4 characteristics that are not found in hospitals with less or no improvement: goals for improvement, substantial administrative support, strong physician leadership advocating beta blocker use, and use of credible feedback.[15] In the setting of the NICU, the introduction of quality improvement programs with audit and feedback mechanisms has improved outcomes.[22,23] In New York State, all 18 regional referral NICUs adopted central-line insertion and maintenance bundles and agreed to use checklists to monitor maintenance-bundle adherence and report check list use. Central-line-associated bloodstream infections decreased by two-thirds.[23]

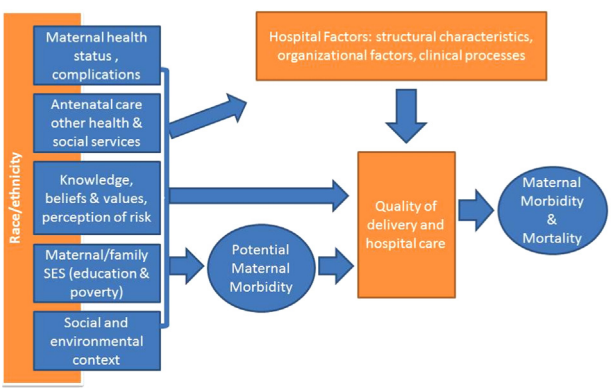

Fig. 1 – Pathways linking hospital organization and quality to disparities in severe maternal morbidity and mortality.

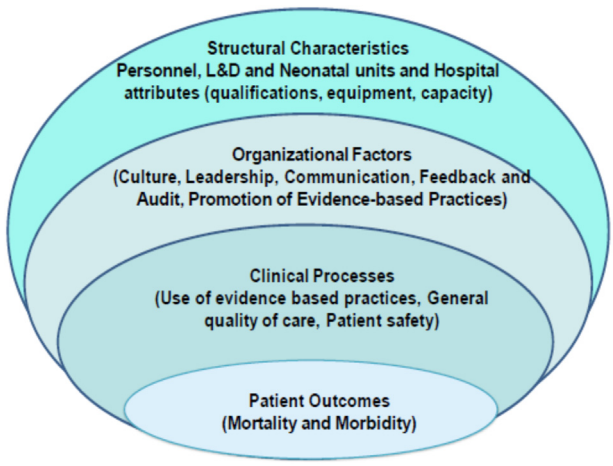

Fig. 2 – Hospital quality and severe maternal morbidity: structural factors.