

# Risk-Appropriate Care to Improve Practice and Birth Outcomes

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## ABSTRACT

Identification and referral of women with high-risk pregnancies to hospitals better equipped and staffed to provide care for them have been important steps to improve birth outcomes. From recent recommendations from the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine to provide regionalized maternal care for pregnant women at high risk and reduce rates of maternal morbidity and mortality, health care organizations and providers have refocused their attention to women's well-being rather than the well-being of the fetus or newborn. Opportunities to improve practice and birth outcomes exist through the implementation of a more standardized and integrated system of risk-appropriate care.

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Maternal and infant mortality rates are the most widely used national indicators of health, and the improvement of maternal and infant health continues to be a public health priority globally. Recently, researchers noted an increase in morbidities that complicate maternal birth outcomes among women of reproductive age, including diabetes, hypertension, and obesity (Callaghan, Creanga, & Kuklina, 2012; Hehir et al., 2017). Approximately 50,000 women in the United States experience severe maternal morbidity during birth each year (Howland et al., 2018). In addition, two to three women die daily in the United States from pregnancy-related complications (Association of Women's Health, Obstetric and Neonatal Nurses, n.d.; Trossman, 2017), and there was a noted increase of 26.6% in the overall maternal mortality rate between 2000 and 2014 (Agrawal, 2015; MacDorman, Declercq, Cabral, & Morton, 2016). These rates are in direct contrast to the global decrease in maternal mortality rates of more than a third during the same time frame (MacDorman et al., 2016). Despite these increases, the implementation of health care policies and evidence-based practices has vastly improved maternal outcomes (Main et al., 2017).

The objective of regionalization is “to improve patient outcomes by directing patients to

facilities with optimal capabilities for a given type of illness or injury” (Institute of Medicine, 2007, p. 77). The regionalization of extant health care services to ensure that all pregnant women and newborns are cared for in appropriate facilities was credited as the major reason for the initial decline in maternal and infant morbidity and mortality rates in the early 1980s (Ananth, Lavery, Friedman, Wapner, & Wright, 2016; Phibbs et al., 2007; World Health Organization, 2014). Although some regionalization exists in most states, there remains a lack of consistency in implementation (Rashidian et al., 2014). The resultant lack of standardized care leads to variations in practice and may be a major contributing factor to worsening maternal health outcomes (Glance et al., 2014). Matching the needs of pregnant women with hospital capacity, local resources, and clinical expertise (i.e., providing risk-appropriate care) improved outcomes for women who experienced major medical and pregnancy complications and ensured that low-risk women remained complication free (Hankins et al., 2012). The purpose of this article is to describe the regionalization of perinatal health care and how such regionalization has influenced maternal and newborn health care and outcomes. Specifically, we review the historical foundations and evolution of the framework for regionalized care, trends and practices of regionalization, and recommendations for nursing practice and health policy.

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## Maternal Morbidity and Mortality

In studies conducted in the past decade, researchers have shown an increase in complications during pregnancy that affect maternal morbidity and mortality rates. [Kuklina et al. \(2009\)](#) found that the number of women with high-risk pregnancies caused by maternal or fetal complications increased significantly since 2000, which led to an increased number of adverse maternal outcomes after birth. More recently, [Hehir et al. \(2017\)](#) found that the risk of morbidity rose 50% for women with high-risk pregnancies and 94% for women without pregnancy risk factors from 1998 to 2011. The leading causes of maternal morbidity are hemorrhage, complications of hypertension, cardiomyopathy, infections, cerebrovascular accidents, and other preexisting medical conditions, such as cardiac disease and diabetes ([Grobman et al., 2014](#)). Death caused by these complications is often preventable with early identification of complications and rapid, aggressive treatment ([California Pregnancy-Associated Mortality Review, 2017](#); [Clark et al., 2008](#)). Changes in overall women's health status, including changes in underlying risk profiles (e.g., pre-pregnancy obesity or preexisting chronic medical conditions), and changes in clinical practice (e.g., inductions of labor and cesarean births) may contribute to rising rates of maternal morbidity and mortality ([Centers for Disease Control and Prevention, n.d.](#)). Evidence further indicates that an increased risk of pregnancy-related death exists for women who are Black, older, or have no or late prenatal care ([California Pregnancy-Associated Mortality Review, 2017](#); [Creanga et al., 2015](#)).

The maternal mortality rate (MMR) in the United States rose from 20.6 deaths per 100,000 live births in 2008 to 2009 to 25.4 per 100,000 live births in 2013 to 2014 ( $p < .001$ ), with a 90% increase among women older than 40 years and 28% increase among non-Hispanic White women ([MacDorman, Declercq, & Thoma, 2017](#)). Non-Hispanic Black women continue to have nearly 3 times the MMR as non-Hispanic White women ([MacDorman et al., 2017](#)). In contrast to these national statistics, among the nearly 500,000 women who give birth annually in California, rates of maternal mortality decreased from 21.5 per 100,000 live births in 2003 to 15.1 per 100,000 live births in 2014, a 58% decline ([MacDorman et al., 2016](#)). California's statistics are consistent with the declining global trend of a 44% decrease in the MMR ([MacDorman et al., 2016](#); [World](#)

[Health Organization, 2014](#)). The improvement in California is thought to be the result of the state's efforts to reduce the MMR through (a) the initiation of a statewide pregnancy-associated mortality review in 2006; (b) development and dissemination of evidence-based tool kits; and (c) the statewide implementation of quality improvement initiatives to address hemorrhage and preeclampsia, two of the most common, preventable contributors to pregnancy-related death ([Druzin, Walsh, Shields, Morton, & Peterson, 2013](#); [Lyndon, Lagrew, Shields, Main, & Cape, 2015](#); [Main, McCain, Morton, Holtby, & Lawton, 2015](#)).

## Risk-Appropriate Care for Pregnant Women

**Regionalization of Perinatal Health Care**  
Regionalized systems of perinatal health care emerged in the United States in the 1970s and gained support in obstetric and pediatric communities as technological advancements were used to improve treatment and survival of high-risk infants, particularly those born preterm. In 1976, the March of Dimes proposed a model system for regionalized perinatal health care in their landmark publication *Toward Improving the Outcome of Pregnancy* ([March of Dimes, 1976](#)). Key elements of this proposed model included (a) preconception and interconception care; (b) structure and accountability; (c) availability of perinatal providers; (d) use of a perinatal data program; and most importantly, (e) well-defined and augmented levels of maternal and neonatal care ([March of Dimes, 1976](#); see [Table 1](#)). These three levels (I, II, III) were based on the ability of a facility to provide care and treatment for maternal and neonatal complications that occur during pregnancy, labor and birth, and the postpartum/newborn periods.

The [March of Dimes \(1976\)](#) defined *regionalization* as the development, within a geographic area, of a coordinated, cooperative system of maternal and neonatal health care. On the basis of population needs and the complexity of care each hospital was equipped to provide, the system would (a) afford quality care to all pregnant women and newborns, (b) maximize use of well-trained perinatal personnel and intensive care facilities, and (c) ensure reasonable cost-effectiveness through mutual agreements between hospitals and maternity care clinicians. Pregnant women would be cared for in facilities

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