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## Troubling news: Maternal mortality is on the rise

Why has a decades-long trend reversed?  
And what can we do to keep our patients safe?

This past summer, the National Center for Health Statistics reported that the maternal mortality rate in the United States is increasing.<sup>1</sup> Analysts came to that conclusion after examining the latest (2004) final data on maternal deaths.

What's causing this rise? And what should our response be as clinicians and as a specialty?

### Tracking an 80-year downward trend

Here are notable snapshots from the recent US history of maternal mortality:

**1930** Maternal mortality was 670 deaths for every 100,000 live births

**1931 to 1960** Improvements in obstetric practices, anesthesiology, and blood banking resulted in a striking reduction in maternal mortality

**1982 to 1996** The low rate held steady—in the range of 7 or 8 maternal deaths for every 100,000 live births<sup>2</sup>

**2003 and 2004** The rate then increased—to 12 and 13.1 maternal deaths, respectively, for every 100,000 live births.<sup>1</sup>

### The cause of the turnaround isn't clear-cut

It is likely that enhanced identification of maternal deaths and an actual increase in deaths have contributed to the reported increase.

### Tracking of deaths has changed

Methods used to define and identify deaths of pregnant women continue to evolve.

Historically, “maternal death” was narrowly defined as “the death of a woman while pregnant or within 42 days after termination of pregnancy, from any cause related to or aggravated by the pregnancy or its management.”<sup>1</sup> In general, recognized obstetric causes are limited to diagnosis codes in the obstetrics chapter of the International Classification of Diseases.

More recently, public health specialists have developed expanded definitions of death among pregnant women to include “pregnancy-related deaths” and “pregnancy-associated deaths.”<sup>3</sup>

**Pregnancy-related death** is the “death of a woman while pregnant or within 1 year of termination of pregnancy, regardless of duration and site of pregnancy, from any cause related to or aggravated by her pregnancy or its management.”<sup>3</sup> Judgments about “causality” and “aggravation” are typically made by an expert panel of clinicians and public health officials after detailed review of cases.

A death is “pregnancy-related” if it has a causal relationship to pregnancy, defined as:

- a complication of pregnancy itself
- a chain of events initiated by pregnancy
- aggravation of an unrelated event or

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### FAST TRACK

The rise in maternal mortality probably stems from both better means of identifying and tracking deaths and a real increase in cases

condition by the physiologic effects of pregnancy.

Within the category of pregnancy-related death, a “direct” death is one that results from obstetric complications of pregnancy; an “indirect” death results from preexisting disease.

**Pregnancy-associated death** is more broadly defined as the death of a woman, from any cause, while she is pregnant or within 1 year after she terminates a pregnancy.

In short, maternal death is most likely underreported.<sup>3,4</sup> As state vital statistics registries adopt broader concepts of obstetric causes of maternal death and improve case-finding methods, it is probable that reported maternal death rates will continue to increase.

**A true rise in maternal deaths?**

Many specialists are concerned that changes in patient characteristics, such as a marked increase in obesity, and evolving obstetric practices, such as a higher rate of cesarean delivery, may be contributing to a significant increase in maternal mortality. Today, the most common reported direct causes of maternal death<sup>5-10</sup> are:

- maternal hemorrhage
- preeclampsia and other hypertensive disorders of pregnancy
- cardiomyopathy
- sepsis
- cerebrovascular accident
- amniotic fluid embolism and
- deep venous thrombosis with pulmonary embolism.

**Better care will yield better outcomes, and fewer deaths**

Obstetricians need to take action to help reduce the number of maternal deaths caused by the diseases and conditions listed in the preceding paragraph; in addition, a number of health-system approaches have the potential to contribute to such a reduction (see the **TABLE**).

A drive to reduce the rate of maternal death touches on every aspect of ob-

**TABLE**

**What can be done to reduce maternal mortality? Actions for the health system to consider**

- Make effective contraception more widely available<sup>1</sup>
- Make community-based general medicine and mental health services also more widely available for women considering pregnancy<sup>2</sup>
- Undertake regular simulation exercises on labor and delivery; such exercises should focus on serious obstetric catastrophes, such as postpartum hemorrhage, and provide a means of assessing and improving the performance of hospital systems<sup>3</sup>
- Establish regional strategies for consulting on and transferring sick pregnant and postpartum women<sup>4</sup>
- Create formal case identification and management programs for women who have severe preeclampsia<sup>5</sup>
- Develop standard consultation guidelines for women with serious chronic diseases who are contemplating pregnancy and those at increased risk of adverse pregnancy outcome<sup>6</sup>
- Reduce the use of cesarean delivery when possible—especially elective cesareans<sup>7,8</sup>
- Reduce the rate of twin and triplet pregnancy
- Improve prevention and treatment of deep venous thrombosis in the peripartum period

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stetrics and gynecology—from providing adequate prenatal services, including community-based general medicine and psychiatric services, to performing complex hysterectomy rapidly in women experiencing massive obstetric hemorrhage caused by placenta previa and

## Lifesaving attention to black patients is needed

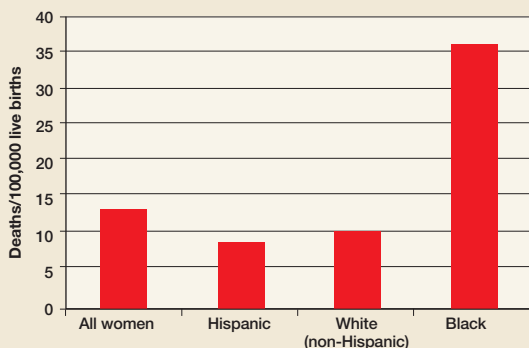
It's a recurring observation that Hispanic and white (non-Hispanic) women have a consistently lower maternal death rate than black women do (see the accompanying figure). This observation likely does not reflect any difference in case finding or in the definition of maternal mortality across states. There is a higher rate of obstetric problems, including preeclampsia, among black women that may account for a percentage of the difference, but the contribution of those problems to a racial discrepancy would be small.<sup>1</sup>

The fact that black women have a markedly increased rate of maternal death for uncertain reasons establishes a clear need for focused research—the goal being to develop targeted interventions to reduce maternal death in this racial group.

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### Among black women, a disproportionately high rate of maternal death



Source: From Table 34 on page 103 of Miniño AM, Heron MP, Murphy SL, Kochanek KD. Deaths: final data for 2004. *Natl Vital Stat Rep.* 2007;55(19):1–120.

placenta accreta. Community-based general medicine and psychiatric services will help women who have a chronic medical problem, such as hypertension, diabetes, or depression, to enter pregnancy in the best possible health. Sharper clinical skills and hospitals' response to such obstetric catastrophes as postpartum hemorrhage will also mean better outcomes. Last, approaches to reducing maternal death must be multimodal and must include sound protocols for system response.

Some of the best approaches to reducing maternal mortality—for example,

early delivery of women with preeclampsia—may increase neonatal morbidity and mortality. Grappling with the trade-off between the health and safety of a mother and that of her newborn is a complex conundrum at the core of the art of obstetric practice.

## These losses are enormous, indeed

A mother's untimely death in childbirth reverberates across generations of her family and through the community. The magnitude of such a loss makes the increase in maternal mortality now being reported a great challenge to the obstetric community. How effective we are at responding to this problem is likely to define the perceived success of American obstetrics over the next decade.

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