

shown the fetus via ultrasound), and provider access (placing undue burdens on those providing abortion care). A number of these laws have been attacked and several defeated, although others often rise like the heads of a Hydra. The piece summarized above from the *New England Journal of Medicine* discussed a recent Supreme Court ruling, *Whole Woman's Health v. Hellerstedt*. In this case, the plaintiffs claimed that provisions in a Texas law that required physicians who performed abortions to have admitting privileges at a nearby hospital and required abortion clinics in the state to have facilities comparable to an ambulatory surgical center both placed an undue burden on abortion access. The majority opinion by Justice Souter supported the plaintiffs' assertion overturning the components of the Texas laws.

While this finding is a potential signal of a new direction from the numerous recent laws and cases that have limited women's abortion access, the author of this piece is concerned about 1 component, the amount of deference left in place to legislation. In a prior case, *Gonzales v. Carhart*, the court deferred to the legislative findings when it came to describing fetal pain. In addition, that case, which upheld the partial birth abortion ban, prioritized fetal well-being over maternal well-

being. Thus, while *Whole Woman's Health* is a step in the right direction, it does not comment on the prior methodological approach of *Gonzales*, leaving that approach open to further limit abortion access. Given that *Whole Woman's Health* cited the issue of an undue burden, one would have thought that the prior finding might have been revisited as using false science to create a justification to deny patient's access to care seems to be parallel to the Texas laws as well.

It is unlikely that this case is the last in this decade regarding abortion to be presented before the Supreme Court. Thus, while US citizens and observers around the world follow every last appointment and the first 100 days of the President-elect, I will be waiting to see who is nominated for the Supreme Court. While the President-elect most recently has made clearly prolife statements, his background is one who has been prochoice, and there are even questions of he and his family supporting Planned Parenthood. Because 3 of our justices are 78, 80, and 83 years old, in addition to the spot left vacant by Antonin Scalia's passing last February, there may be other opportunities for this upcoming president to leave a legacy that can last for decades. We will gain insight into that legacy with his first Supreme Court nominee.—ABC)

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# Global, Regional, and National Levels of Maternal Mortality, 1990–2015: A Systematic Analysis for the Global Burden of Disease Study 2015

GBD 2015 Maternal Mortality Collaborators

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## ABSTRACT

Seventeen Sustainable Development Goals (SDGs) were adopted by the global community to provide benchmark targets for global development between 2015 and 2030 and to reframe the Millennium Development Goals (MDGs) to achieve sustainable global development. This report presents data on maternal mortality in 195 countries from 1990 to 2015. Maternal mortality data were categorized in 3 formats, namely, number of deaths, cause-specific mortality rate per capita, and cause fraction. The overall maternal mortality was modeled using cause-of-death ensemble modeling (CODEm). The number of deaths, maternal mortality ratios (MMRs), and 95% uncertainty intervals were reported for all estimates.

The results indicate that the overall decline in global maternal deaths from 1990 to 2015 was approximately 29% (390,185 in 1990; 374,321 in 2000; and 275,288 in 2015), and the reduction in MMR was 30% (282 in 1990, 288 in 2000, and 196 in 2015). In 1990, it was found that 60 countries had an MMR of more than 200, 40 countries had an MMR of more than 400, 15 countries had an MMR of more than 600, and 1 country had an MMR of more than 1000. By 2015, 122 countries had an MMR of less than 70, and 49 countries had an MMR of less than 15. Although MMR and Sociodemographic Index improved between 1990 and 2015 in almost all regions, it was observed that MMR did not universally track with Sociodemographic Index over the whole time period in any single region. The observed minus expected (O – E) MMR ratio was consistently found to be 1.25 or more in many regions; however, MMR reductions slowed considerably, and the O – E MMR ratio was 1.41 in 2015. The risk of maternal mortality increased greatly with age, but decreased greatly in almost all age groups from 1990 to 2015. It was observed that MMR in 10- to 14-year-old girls in 2015 was 278; it then decreased and was lowest in women aged 15 to 29 years before increasing significantly to 1832 in 50- to 54-year-old women. Direct obstetric causes accounted for 86% of all maternal deaths in 2015 due to maternal hemorrhage, maternal hypertensive disorders, and other maternal disorders in comparison to 1990 when direct complications accounted for 87% of all maternal deaths. Other maternal disorders caused approximately 74,299 deaths in 1990 and decreased to 32,734 deaths in 2015.

The study authors conclude that although there is global progress in reducing maternal mortality in the past 15 years, more and better data collection systems should be put in place to devise better health care policies and to educate women about reproductive care options available to them.

### EDITORIAL COMMENT

(The death of a pregnant woman or a mother in labor is a tragedy for her family and often reflects deficiencies in the health care system. The most common causes of maternal death are hemorrhage, hypertension, or infection, and most are thought to be preventable with access to high-quality, modern health care. It is an unfortunate reflection of the disparities in global health that 99% of maternal mortality occurs in low-income countries (*Trends in Maternal Mortality: 1990–2010*. Geneva, Switzerland: World Health Organization, 2012; <http://www.unfpa.org/public/home/publications/pid/10728>). Improving women's health care in low resource settings was highlighted by the United Nations MDGs, which promote gender equality and maternal and child health and had a goal of reducing maternal mortality by 75% between 1990 and 2015.

The goal of this current report was to quantify maternal mortality throughout the world by underlying cause and age from 1990 to 2015, to assess whether those goals had been met. Overall, a decrease was found in global maternal deaths from 1990 to 2015 of approximately 29%, with a decrease in MMR of 30%; both of these fall well short of the MDG 5 goal of 75%. A total of 10 countries achieved MDG 5, including Iceland, Jordan, Maldives, Belarus, Morocco, Romania, China, Turkey, Poland, and Estonia, whereas maternal mortality increased in 26 countries, including the United States. However, it was noted that the United States has improved its tracking system with addition of a pregnancy checkbox on the standard death

certificate, so it is possible that at least a portion of the increase is related to enhanced case ascertainment (*Public Health Rep* 2011;126:195–200).

The authors hypothesized that MMR improvements are related to specific facets of health care, and they examined the relationship between MMR and occurrence of 1 prenatal visit, 4 prenatal care visits, in-facility delivery, and skilled birth attendance over the period from 1990 to 2015. They found that, on average, countries with the lowest MMR had the highest (98%) rate of at least 1 prenatal care visit, 95% of 4 prenatal care visits, 97% of in-facility delivery, and 99% of skilled birth attendance. Although they point out the importance of many other variables, they were not able to investigate differences such as distance to obstetric care, postpartum care, or family planning services such as access to contraception and safe abortion services, but they do call for capture and analysis of such data.

A few interesting and important points arise from this study. Previous analyses have truncated evaluation of maternal mortality at 15 years to 49 years. Doing so ignores pregnancies in the youngest and oldest gravidas, who are at high risk. This current report expanded the age range to include all 5-year age groups from 10 years to 54 years and confirms a high number of pregnancies in such women, with generally a higher mortality rate. The high rate of maternal mortality in the United States, far above other high development index countries and comparable to many South American and

Central Asian countries, continues to be disturbing. While the large apparent increase in MMR in the United States, from 17.5 per 100,000 in 2000 to 26.4 per 100,000 in 2015, may be due in large part to changes in ascertainment and tracking, the absolute rate is still distressingly high and reflects poorly on the American health care system and the wide disparities in care seen in the United States.

A challenge in global health, and in investigations of means to improve health in developing countries, is often a lack of adequate baseline data—this is actually a tremendous obstacle to assessing global health interventions. It is recognized that improvements in the social status of women, with improvements in education, are highly associated with lower rates of maternal mortality. Such improvements in social status and education for women generally lead to better birth planning, more awareness of maternal complications and the potential to respond effectively to those, and improved ability to navigate the health care system. Overall, it is the multipronged improvement in many aspects of social and health care systems that together can

lead to decreases in maternal mortality. Again, those variables were not captured completely in this report, but the authors do call for increased tracking of such factors.

Overall, there continue to be tremendous opportunities to decrease maternal mortality through improvements in the health systems, but also through general improvements in social conditions and, in particular, in the social status of women. Fortunately, there are commitments to maternal and child health being spearheaded through various global health organizations, including the UN Secretary-General's initiative: *Every Woman Every Child*. Improving women's health, and saving women's lives, starts with ensuring women have control over their reproduction and can determine the timing and spacing of their children and the size of their families. Our society should not tolerate maternal death rates in parts of the world that are 200 times higher than those in developed countries; working with developing countries to implement these priorities can clearly be effective in greatly improving the lives of women and children in the poorest regions of the world.—MEN)

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# Antenatal Betamethasone: A Prolonged Time Interval from Administration to Delivery Is Associated With an Increased Incidence of Severe Intraventricular Hemorrhage in Infants Born Before 28 Weeks' Gestation

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## ABSTRACT

Studies, including several randomized controlled trials, have reported that neonates exposed to antenatal corticosteroids have reduced incidence of death, respiratory distress syndrome (RDS), and severe grades of intraventricular hemorrhage (IVH). The present study aimed to investigate the effects of antenatal corticosteroids on severe IVH in infants born at less than