

Poor Maternal Outcomes in the United States

What is Happening and What Can Be Done?

Key Takeaways

Although maternal outcomes have improved globally over the past three decades, the United States has the highest percentage of maternal deaths of all OECD nations and is the only one with a rising maternal mortality ratio (MMR).

Four out of five maternal deaths occur outside the hospital before or after childbirth, suggesting that social support is important to improving maternal outcomes.

Some experts suggest that social determinants of health in the US contribute to overall maternal health and can play a role in reducing disparities in maternal health outcomes.

Most or all of the US' worsening MMR is due to disproportionately worse maternal outcomes for African-American women, who are three or four times more at risk for maternal death than white mothers.

The California Maternal Quality Care Collaborative (CMQCC) has dramatically reduced the state's MMR over the last decade by implementing standardized best practice toolkits for childbirth and working with hospitals to create a centralized maternal outcomes database; other states are now looking to partner and incorporate similar lessons learned.

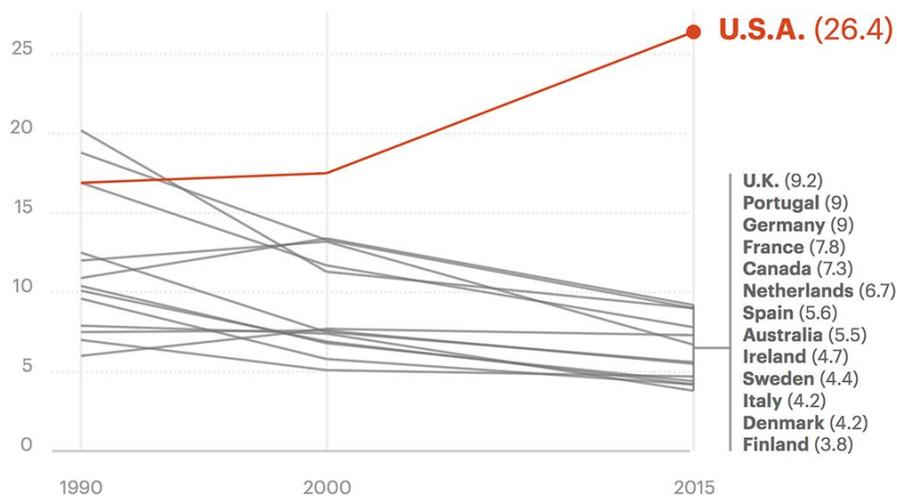
Introduction

Maternal death, and specifically preventable maternal mortality, is an important proxy for the overall quality of maternal healthcare and public health within a nation. A standard measure used internationally is the maternal mortality ratio (MMR), calculated by the number of maternal deaths per 100,000 live births. A maternal death is formally defined as the death of a woman while pregnant or within 42 days of the end of pregnancy.

Where the US Stands

An estimated 10,900 babies are born each day in the United States, adding up to four million births each year [1]. Childbirth is the most common reason for hospital visits in the US and accounts for roughly 10 percent of all hospital stays [2]. In 2008, one in five female hospitalizations were a result of pregnancy or childbirth [3]. Despite spending twice that of most other high-income countries on maternal health [4], the United States lags substantially behind other countries in improving health outcomes for women and mothers.

Currently, the US is ranked 46th globally for maternal mortality rate and has the highest percentage of maternal deaths of any developed nation, making it one of the most dangerous places in the developed world to give birth [1]. While other countries have dramatically decreased their MMRs, the US MMR increased between 2000 and 2015 from 17.5 to 26.4 deaths per 100,000 births [5]. According to a 2018 report by the CDC, over 60 percent of those deaths were preventable [6]. Direct causes of maternal death include emergency conditions such as hemorrhage and infection [7], while an increasing trend in life-long health complications post-childbirth, or maternal morbidity, can be caused by maternal age, cesarean delivery, and chronic conditions like obesity, diabetes, and hypertension [4].



"Global, regional, and national levels of maternal mortality, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015," *The Lancet*. Only data for 1990, 2000 and 2015 was made available in the journal.

The two main contributing factors to maternal death in the United States highlighted in the CDC report include [8]:

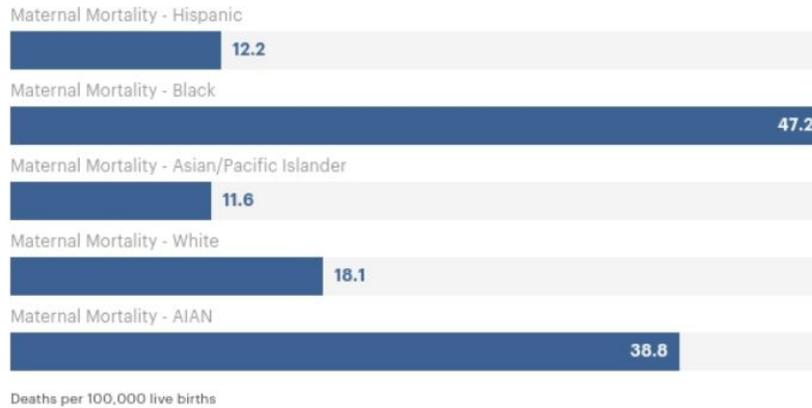
- Patient and family education (knowledge of warning signs and the need to seek care)
- Providers and systems of care (accurate diagnosis and coordinated, effective treatment)

New data reflect potential systemic issues causing women across all age groups to die earlier, as the mortality rate for women in the US was declining between the 1950s to 2000s but then increased from 2010 to 2016; US maternal mortality rates also follow a similar pattern [9]. Recent research has questioned whether the jump in maternal deaths is artificially created by past underestimation and current progress in data collection [10], such as with the inclusion of a standardized pregnancy status checkbox on death certificates in all states by 2015 [11]. Despite this, maternal mortality data access and timeliness are still lacking in the US and often varied at the state level, where information is collected before being passed on to federal agencies [12]. (The last official maternal mortality rate by the CDC was published back in 2007.)

Racial and Ethnic Disparities in the US: The Effect on Outcomes

The data show that race and ethnicity are powerful predictors of maternal outcomes, with significant disparities between demographic groups. Notably, maternal outcomes are actually improving for white women, but declining for black women at a rate so steep that the national trend is in the direction of poorer maternal health [13].

Race/Ethnicity



Source: CDC WONDER Online Database, Mortality files, 2011-2015

These disparities are increasingly impactful as the demography of the US continues to shift. Today, about half of births in the US are to women of color [9]. Social determinants of health, including access to healthy food, safe neighborhoods, good schools, and steady jobs have been identified by experts as contributing to the challenges the US faces in ensuring positive maternal health and reducing disparities in maternal health outcomes [13].

One of the most visible racial disparities within the United States is that African-American mothers are three to four times more likely to suffer pregnancy- or childbirth-related deaths than are white mothers [6]. This gap in maternal mortality has existed historically and continues to grow today. In part, this gap has been linked to systemic healthcare access, as black women are more likely to be uninsured and live near lower-quality hospitals [13]. Researchers

hypothesize that this disparity may be additionally influenced by medical providers' unconscious biases, which contribute toward taking black women less seriously when they express concerns around their symptoms or pain levels. However, four out of five deaths

“Each maternal death is a tear in the community fabric – a child without a mother, parents without a daughter, and partners without their other half.”

- David Goodman, PhD, Centers for Disease Control and Prevention (CDC) Division of Reproductive Health

happen pre- or post-childbirth, meaning before or after admission for actual labor and delivery [14]. This highlights a potential lack of social support and services in addition to lack of access to medical care. Yet the data also shows that African-American mothers are more likely to die than their white counterparts even when controlling for education, income, and other socioeconomic factors [13]. Whatever the etiology, black women are at greater risk for maternal death and at an earlier age than typical for the rest of Americans, and addressing this disparity is crucial to improving the national maternal mortality ratio.

Case Study: Spotlight on California Maternal Quality Care Collaborative (CMQCC)

As maternal mortality ratios across the nation rise, California stands as the exception. From 2006 to 2013, the state lowered its MMR by 55 percent, from 13.3 to 7.3 deaths for every 100,000 births [15]. That ranks California's MMR as lower than average compared to all OECD countries, calculated as 12 deaths per 100,000 births in 2015 [16].

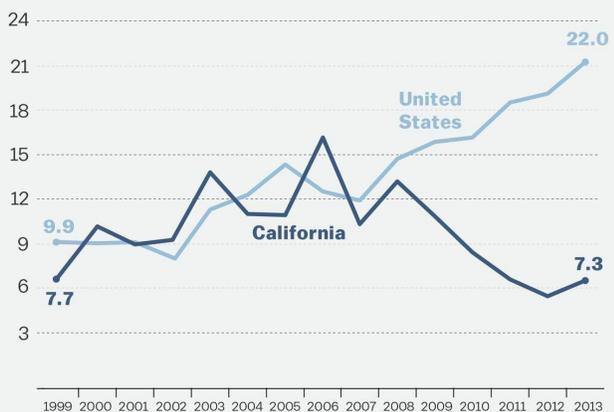
Beginning in 2006, the California Department of Public Health and the California Maternal Quality Care Collaborative, a public-private multi-stakeholder partnership founded at the Stanford University School of Medicine, worked to:

- Gather research from the California Pregnancy-Associated Mortality Review (CA-PAMR)
- Develop and spread free evidence-based toolkits with policies, procedures, and checklists for hospitals and clinicians to reduce preventable death and injuries during childbirth
- Create a low-burden, low-cost maternal data center containing practitioner-level data and garnering participation from a majority of all 240 Californian birthing hospitals

According to the CMQCC's 2017 report, 88 percent of California's birthing hospitals have joined the collaborative [17], accounting for a total of 95 percent of all births in the state [13]. So far, hospital utilization of the toolkits has been linked to a 21 percent decrease in severe maternal morbidity due to hemorrhage, compared to a non-significant 1 percent in non-participating hospitals [17].

California has bucked America's maternal mortality trend

Maternal deaths per 100,000 live births



SOURCE: California Department of Public Health



“A mother’s death in the hospital often reflects a lack of preparation to deal with rare or catastrophic complications,” says Barbara Levy, MD Vice President of Health Policy at the American College of Obstetricians and Gynecologists [12]. CMQCC has encouraged hospitals adopt a mandatory plan and drill their staff to prepare for managing emergency maternal conditions.

A Conversation with Dr. Elliott Main, Medical Director of CMQCC:

According to Elliott Main, MD, CMQCC was able to gain buy-in from so many diverse stakeholders to share data transparently by first starting with a small successful project with a few organizations to build momentum and then building relationships with key leaders, such as the California Hospital Association and the American College of Obstetricians and Gynecologists. Both organizations were aligned on improving maternal quality of care and felt the issue was timely and urgent. The initiative also relied on hard numbers from peer-reviewed published articles to show the drastic need for change, but this was during a period before national media coverage and heavy politicization of the topic.

We also asked Dr. Main about the breakdown of cost savings as a result of participation in CMQCC for healthcare players along the spectrum. He commented that while cost savings may not be direct to participants because our US health system is so intertwined and complicated, CMQCC is working to incentivize all parties to do their share and “do what’s right.” For example, health plans receive most of the actual savings even though hospitals are the ones carrying out quality improvement efforts. CMQCC is thus working with plans on building out quality measures and incentives to pay hospitals and providers directly for successful quality improvements. Additionally, Dr. Main lists CMQCC’s main mechanisms for change as payment, transparency, and regulation. Transparency can drive pressure for change by publicly publishing statistics and awarding hospitals that reach target numbers. Another potential avenue to truly share cost savings might be through bundled payments or ACOs, but both payment methods are not predominant for maternal outcomes currently.

California’s collaborative is now looking to focus on closing racial disparities for the future.

Potential lessons from California that can be adopted across the nation are to: invite public-private collaboratives, utilize instruction manuals, centralize maternal data collection, and further tie collected public health data to clinical decision-making and provider training.

Looking Beyond California

Beginning in 2014, twenty-five states have joined and ten are on the waitlist for the Alliance for Innovation on Maternal Health (AIM) – a partnership of the American College of Obstetricians and Gynecologists, the American College of Nurse-Midwives, and the American Hospital Association – to replicate the methods pioneered in California by

TheZetemaProject

“bundling” maternal safety best practices [18]. Four AIM states have already shown a decrease in maternal morbidity rate between 8.3 and 22.1 percent since 2015 [19]. In 2018, this partnership earned an additional two million dollar grant from the Health Resources and Services Administration (HRSA) to expand the number of states participating in the initiative. Dr. Elliott Main also acts as the national implementation director for AIM and highlighted Illinois, Florida, and North Carolina as the three states which have been the most promising in rolling out a similar initiative to California.

Other success stories include lower and middle-income countries (LMIC) such as Ethiopia, Uruguay, and Bangladesh, which have made headway on tackling maternal mortality over the last thirty years and reduced rates by 65-78 percent through both early detection and patient empowerment [4]. Uruguay is closest to the United States in terms of maternal numbers, with a decrease in MMR from 37 in 990 to 15 in 2015; Ethiopia fell from 1250 to 353 and Bangladesh from 569 to 176 during the same period [20]. Three identified barriers to maternal care for women in both LMIC and the US include: delay in seeking care, reaching care, and receiving adequate healthcare. These international comparisons have motivated a contingent of American advocates to push for some form of universal coverage in the US, as maternal mortality is clearly linked to lack of access to care [21].

Potential translatable lessons from successful LMIC countries for minority, low-income, and rural populations in the US include:

- Patient facing alerts, including cell phone reminders around appropriate care, and increased communication options to health professionals,
- Telehealth using mobile platforms to improve maternal education and care delivery,
- Longitudinal patient-controlled health records through the use of smart card chips and national patient identifiers to easily recognize early warning signs,
- Patient-family relationship tracking within EHR systems to ensure continuous information sharing to the correct parties, and
- Grassroots community health workers to reach out to pregnant women in their communities and homes to provide quality, culturally competent care.

Actions Taken to Combat Increasing Maternal Deaths

Growing awareness of and concern about maternal health outcomes in the US led to the passage of the Preventing Maternal Deaths Act (HR1318) on December 11, 2018, signed by President Trump following a unanimous bipartisan vote. This law will establish a program under the Department of Health and Human Services (HHS) to provide \$12 million annually in grants for 5 years to fund the creation of state committees that will review maternal deaths and investigate ways to prevent them [12].

The law extends the definition of a “pregnancy-associated death” as the death of a woman while pregnant or up to one year following the end of pregnancy [22]. In addition, mandatory state reporting will be required and HHS is directed to take steps toward researching and reducing maternal health outcome disparities.

This initiative is similar to what has worked in the UK – which has lowered its MMR to 8.2 maternal deaths per 100,000 live births [23] – where a national committee investigates every maternal death and publishes statistics that drive women’s health policy across the country [24]. A key difference between the two countries is the emphasis on medical mortality for the mother versus the child. While the US health system has focused on preventing infant mortality, British medical professionals are required to prioritize a mother’s wellbeing and stabilize her first if both she and her baby are in danger. In the UK, universal access to more equivalent medical and maternal care may also contribute to a lack of mortality differences between socioeconomic classes in comparison to the United States [25].

There has also been debate around the effectiveness of state committees in the US. According to ProPublica, about 35 states currently have review committees or are in the process of forming them [26]. Arguments against the independent state initiatives include skepticism that states will consistently focus upon the correct issues and conclusions and that a federal agency such as HHS or CDC or a private entity such as Planned Parenthood should track maternal research instead. According to some, “only by aggregating and analyzing states’ data on maternal deaths can clinicians and researchers hope to find the

broader patterns and repeated errors that would lead to an evidence-based national action plan” [12].

Increasingly, healthcare players are also being asked to proactively step in and expand their efforts to prevent poor maternal outcomes. In Illinois, lawmakers are questioning major health insurers directly on what actions they are taking collectively to improve maternal coverage and reduce racial disparities [27]. Large employers in California like Disney and Apple have also worked with CQMCC to pressure hospitals to share data and follow recommendations in order to protect women in the workforce against preventable maternal complications [28].

Conclusion

Lessons from California and other OECD and LMIC countries have the potential to be adapted nationally to provide a standardized, data-driven approach towards identifying and overcoming barriers to care. With the passage of HR1318, the United States is poised to make significant strides towards providing better, more equitable maternal care for women. Further recommendations for maternal health reform include: improving access to care, provider or community health worker training, telehealth coordination, and family communication. Substantial change in improving maternal outcomes may require increasing care touch points with mothers and coordination between all healthcare parties along the US care continuum.

Discussion Questions

Does the United States healthcare system provide appropriate incentives for providers to decrease maternal mortality rates?

What can hospitals do differently to prevent maternal mortality?

Should certain practices be mandated by law or incentivized in some form?

What role does the market play versus regulatory solutions?

How important are data reporting requirements?

Is universal coverage enough to reduce the socioeconomic differences in maternal rates?

To what degree are the social determinants of health responsible for disparities in maternal outcomes, and what - if anything - can healthcare do about it?

Whose responsibility is it to guarantee the continuation of care of expecting mothers outside the hospital?

In what ways can payers increase access and quality to maternal care?

Is California's success in addressing maternal mortality rates unique to the state?
Or are the state's methods applicable to the rest of the country?

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