

# MATERNAL MORTALITY IS A KEY INDICATOR OF THE HEALTH SYSTEM

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## Abstract

The health status of any given country depends upon maternal and infant mortality rates, which play a crucial role in evaluating the country's population health, quality of care, socioeconomic status, and poverty.

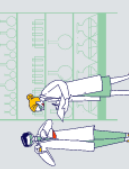
**Keywords:** Maternal mortality, Near-miss, Asia-Pacific, maternal death, maternal morbidity.

## Introduction

Maternal mortality is one of the important indicators used for the measurement of maternal health. Although maternal mortality ratio remains high, maternal deaths in absolute numbers are rare in a community. To overcome this challenge, maternal near miss has been suggested as a compliment to maternal death. It is defined as pregnant or recently delivered woman who survived a complication during pregnancy, childbirth or 42 days after termination of pregnancy. So far various nomenclature and criteria have been used to identify maternal near-miss cases and there is lack of uniform criteria for identification of near miss. The World Health Organization recently published criteria based on markers of management and organ dysfunction, which would enable systematic data collection on near miss and development of summary estimates. The prevalence of near miss is higher in developing countries and causes are similar to those of maternal mortality namely hemorrhage, hypertensive disorders, sepsis and obstructed labor. Reviewing near miss cases provide significant information about the three delays in health seeking so that appropriate action is taken. It is useful in identifying health system failures and assessment of quality of maternal health-care. Certain maternal near miss indicators have been suggested to evaluate the quality of care. The near miss approach will be an important tool in evaluation and assessment of the newer strategies for improving maternal health [11].

WHO identifies MNM cases based on clinical-based, laboratory-based, and management-based indicators of organ dysfunction. However, these criteria are not used universally, and some countries use complication-based or management-based criteria instead. Sharing many characteristics with the review of female individuals who die from maternal causes, clinical audits of those who survive life-threatening complications are an effective tool to improve the quality of maternal health care [8].

Women are at risk of developing severe morbidity and mortality during pregnancy, childbirth and postpartum, especially in low-income and middle-income countries where 99% of all maternal deaths occur. Improvement of maternal health is urgently needed and one of the



sustainable development goals is to reduce the global maternal mortality ratio to less than 70 per 100 000 live births by 2030. Reports about the incidence of maternal near miss have been published for several high- and low-income countries, and the applicability of the WHO maternal near-miss tool has been evaluated in several of these. However, data are lacking about maternal near miss in middle-income countries [9].

Maternal morbidity and mortality are global socioeconomic and healthcare burdens, and postpartum infections account for a significant, and often preventable, portion of that burden. The postpartum period is traditionally defined as the six weeks following delivery, and infections are relatively common, affecting an estimated 5 to 7% of women during this time. Puerperal sepsis is one of the top five causes of maternal deaths worldwide and accounts for 10 to 15% of deaths in the postpartum period. Infections are also the most common cause of death following spontaneous or induced abortions [4].

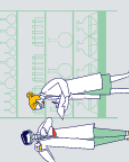
In 2017, an estimated 11.9 million cases of direct maternal infections occurred worldwide. Maternal deaths due to infection occur mainly through maternal sepsis, a life-threatening condition defined as organ dysfunction resulting from infection during pregnancy, childbirth, post-abortion or postpartum period. In 2017, an estimated 5.7 million women developed sepsis during pregnancy, childbirth or the postpartum period. Infections during or following childbirth not only increase maternal mortality and short-term morbidities, but also can lead to long-term disabilities such as chronic pelvic pain, fallopian tube blockage and secondary infertility [5].

Increasing efforts toward quality improvement (QI) are necessary in low- and middle-income countries (LMICs) to reduce maternal and perinatal mortality and morbidity and to promote respectful care. In Brazil, perinatal health indicators are below targets in several states despite universal access to perinatal services and very high rates of institutional births, indicating poor quality of care (QoC) as a key issue to be addressed. However, research efforts to develop and test QoC improvement interventions are scarce. [7].

The United States faces an alarmingly high rate of maternal morbidity and mortality, a fact that distinguishes this country from other high-income countries that have achieved decreases in maternal morbidity and mortality in recent years. According to 2018 data from the Organisation for Economic Co-operation and Development, the United States ranked 35th out of 36 countries, ahead of only Mexico, and with a maternal mortality rate twice as high as Canada and nearly three times as high as the United Kingdom. In addition, severe maternal morbidity, which includes unexpected outcomes of labor and delivery that result in significant short- or long-term consequences to a birthing person's health ([Kilpatrick and Ecker, 2016](#)), has been steadily increasing in recent years ([Ahn et al, 2020](#)) [6].

In 2020, there were approximately 287,000 maternal deaths globally, with maternal mortality rates increasing in Europe and North America [2].

Although more than 50% of deliveries in Mozambique occur at health facilities, high maternal mortality rates – an estimated 506 deaths per 100,000 live births in 2014 – have persisted as a public health issue [14].



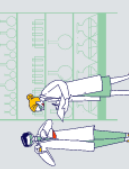
Moreover, maternal health is likely to bring economic benefits for the whole family and society. But recently, mothers' poor health, especially maternal deaths, have remained an unavoidable phenomenon that occurs at relatively high rates in many developing countries despite a steep reduction in maternal mortality worldwide since 1990 [13].

Despite spending more on maternity care than any other country, the United States has the highest rate of maternal mortality among high-income countries. Further, although maternal mortality—a key indicator of health and well-being of a country—is declining globally, the United States is one of only two nations seeing a rise since 2000 in deaths from complications related to pregnancy and childbirth [1]. Risk of maternal morbidity and mortality is unevenly distributed in the United States, with Black and Indigenous women three to four times as affected as their white counterparts, and disparities in mortality worsened during the pandemic. The determinants of maternal morbidity and mortality and associated racial/ethnic and social inequities are complex, multi-factorial, and less well understood. Still, experts agree that many maternal deaths are preventable. Further, trends in maternal morbidity and mortality in the United States reflect increases in rates of cesarean birth, preexisting chronic medical conditions, and advanced maternal age [4]. Approximately 70% of maternal deaths occur in sub-Saharan Africa (SSA), with Nigeria alone accounting for more than two-fifths of the global burden of maternal deaths. For stillbirths, over 40% occurs in SSA, with those occurring in Nigeria being about 10% of the worldwide burden [3].

We estimated the LTR-MNM for 40 countries with multifacility, regional, or national data on the prevalence of MNM morbidity measured using WHO or modified WHO criteria of organ dysfunction from 2010 onwards (Central and Southern Asia=6, Eastern and Southeastern Asia=9, Latin America and the Caribbean=10, Northern Africa and Western Asia=2, sub-Saharan Africa=13). We also calculated the lifetime risk of severe maternal outcome (LTR-SMO) as the lifetime risk of maternal death or MNM.

The LTR-MNM ranges from a 1 in 269 risk in Viet Nam (2010) to 1 in 6 in Guatemala (2016), whereas the LTR-SMO ranges from a 1 in 201 risk in Malaysia (2014) to 1 in 5 in Guatemala (2016). The LTR-MNM is a 1 in 20 risk or higher in nine countries, seven of which are in sub-Saharan Africa. The LTR-SMO is a 1 in 20 risk or higher in 11 countries, eight of which are in sub-Saharan Africa. The relative contribution of the LTR-MNM to the LTR-SMO ranges from 42% in Angola to 99% in Japan [10].

Many pregnant women continue to suffer severe maternal morbidity (or a maternal “near miss” event) around the world. While causes and risk factors for maternal deaths have been extensively investigated, severe maternal morbidity has not had the same focus, particularly in low and lower-and-middle-income countries (LMIC). In settings where absolute numbers of maternal deaths are low or underreported, monitoring rates of severe maternal morbidity/near misses can be used to better assess the quality of health systems. The AsiaPacific region is diverse with a high number of LMICs, each with unique sociocultural and geographical challenges that have the potential to contribute to poor maternal outcomes. Assessing maternal morbidity is essential to improving maternal health in this region [12].



## Conclusions

Identifying risk factors pregnant and birthing people face is vitally important. Limited depth and quality of available research within each social and structural determinant of health impeded our ability to outline specific pathways, including risk factor interdependence. While more recently published literature showed a trend toward increased rigor, future research can emphasize techniques that estimate the causal impacts of risk factors. Improved reporting in studies, along with organized and curated catalogues of maternal health exposures and their presumed mechanisms, would make it easier to examine exposures in the future.

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