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Editorial

# Reducing Preventable Maternal Deaths in Nepal

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On March 24, 2023, the Nepal Government's National Statistics Office (formerly the Central Bureau of Statistics) and the Ministry of Health and Population (MoHP), in collaboration with several external development partners, organized a study dissemination meeting, which was attended by the then Prime Minister. The primary purpose of the event was to disseminate findings from a study that aimed at assessing the current maternal mortality status in Nepal.[1]

Unlike previous maternal mortality data obtained from probability surveys (e.g., Nepal Demographic and Health Surveys[2,3]), the data for this particular study were collected through a census enumeration.[1] First, during the 2021 census, each household head was asked whether any deaths had occurred in the household during the 12 months preceding the census day. For any female deaths reported in the 15-49 age group, the timing of death (whether during pregnancy, delivery, post-pregnancy, or post-abortion within 42 days of delivery) was recorded. These records were then shared with the MoHP maternal mortality study team stationed in communities in the country.

In the second phase, the MoHP team visited these households to verify the census information and conducted a verbal autopsy module/survey to gather additional details about the circumstances and causes of death. The respondent for the verbal autopsy was an immediate family member of the deceased woman who was closely familiar with the case. Since the 12-month period covered in the maternal death records mostly fell within 2021 (November 2020—November 2021), the maternal mortality data may be referred to the year 2021.

The retrospective nature of verbal autopsies may have introduced some recall biases and inaccuracies. Additionally, some underreporting may have occurred. No adjustments were made for potential underreporting of births or deaths in the report. Despite these limitations, the data represent information from every household that reported a maternal death. It must be acknowledged that a complete enumeration of all maternal deaths, supplemented by a verbal autopsy, is undoubtedly a major undertaking in terms of time, investment, and human and financial resources.

The study identified a total of 622 deaths, resulting in a national maternal mortality ratio (MMR) of 151 per 100,000 live births for the period November 2020—November 2021. The MMR ranged from 98 in Bagmati Province to 207 in Lumbini Province, with Karnali Province having the second highest MMR at 172. Lumbini Province's MMR was more than twice that of Bagmati Province. The Terai region had an MMR of 147, compared to 159 in the Hill region and 133 in the Mountain region.

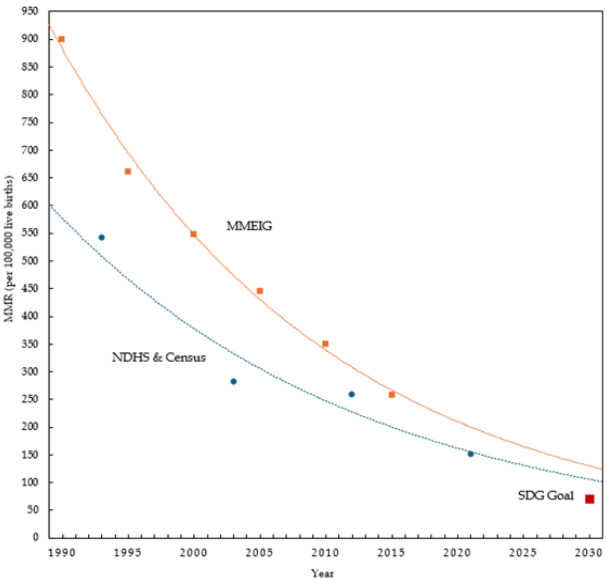
These data highlight the persistent disparities across provinces and ecological regions. The report also revealed that non-obstetric complications followed by obstetric hemorrhage were the leading causes of maternal deaths (31% and 25%, respectively). The majority (61%) of deaths occurred within 42 days following the delivery (postpartum period).

While more detailed analyses of the data are anticipated, the findings of the report underscore where Nepal currently stands and the challenges ahead. In this context, it should be noted that Nepal has set the target of achieving an MMR of 70 by 2030, as part of the Sustainable Development Goals.[4] The recent mortality status report prompts critical reflection: how does the 2021 MMR compare to the trend over the years and the goal, which is only five years from now?

## Levels and Trends

MMR data based on the past three (1996, 2006, and 2016) Nepal Demographic and Health Surveys (NDHSs) and the 2021 census cover a 32-year period (1989-2021). Graph 1 shows the curve fitted to the MMRs (point estimates) for the period from 1990 to 2030. The graph also includes estimates from the UN Maternal Mortality Estimation Inter-agency Group (MMEIG), led by the World Health Organization (WHO).[5] While the MMEIG data are not completely independent of the Nepal NDHS data, their model estimates incorporate data from multiple countries and sources, including a previous survey in Nepal which had estimated a high level of MMR.

Graph 1. Levels and trends of maternal mortality ratio, based on surveys, model estimated rates, and curve fitted to the data, Nepal, 1990-2030




MMEIG=UN Maternal Mortality Estimation Inter-agency Group, NDHS=Nepal Demographic and Health Survey, Census=Census of 2021.

*Note:* The data referring to 1993, 2003, and 2013 are mid-year of a seven-year average representing the survey years 1989-1996, 1999-2006, and 2009-2016, respectively. The estimates are obtained from three Nepal Demographic and Health Surveys (NDHSs) undertaken in 1996, 2006, and 2016. The maternal mortality ratio (MMR) per 100,000 live births referring to 2021 is from the census covering the period, November 2020 to November 2021. The equation for the NDHSs and census data is: $Y=598.9\exp(-0.042x)$ (with an implied annual rate of change of -4.11). Similarly, the equation for the MMEIG data is: $Y=925.5\exp(-0.048x)$ (with an implied annual rate of change of -4.69).

According to the MMEIG-based predicted values, the MMRs for the years 2021 and 2030 are 209 and 136, respectively. Similarly, predicted MMRs based on the NDHS and census are 163 and 112 for the years 2021 and 2030, respectively. This indicates that the predicted MMR for the year 2030 will be 42 points higher than the targeted goal (112 vs. 70). For the same year, the gap based on the MMEIG values would be considerably larger (136 vs. 70, a difference of 66 points). It is also worth noting that the census-based national MMR estimate of 151 corresponds closely to the model-fitted MMR of 163 for 2021. However, if we visualize an alternative trend as the average of the two curves in Graph 1, the predicted MMR levels and the trend will be even higher than the gap between the lower curve and the SDG goal.

Overall, the trends show that the MMEIG estimates of MMR levels and trends are considerably higher than those from the NDHS data, although they are converging as mortality levels continue to decline. If the past trend is any guide, Nepal may fall short of its 2030 goal. While Nepal may not be alone in missing the SDG target, this serves as a stark reminder of the possibility of not reaching the goal.

## Commentaries

Given the significance of the recent report's findings, the EJMS invited selected professionals to comment on various aspects of the maternal mortality status presented in the report. This led to the inclusion of six commentaries in this issue of the journal, each broadly relating to the six 'building blocks' of a health system, as defined by WHO[6]: (i) service delivery, (ii) health workforce, (iii) information/data, (iv) medical products, vaccines, and technologies, (v) financing, and (vi) leadership/governance.

Jha[7] provides a critical review of Nepal's most recent National Medical Standards, specifically regarding the prevention of maternal deaths due to postpartum hemorrhage (PPH), which accounts for one-fourth of maternal deaths. She discusses specific areas and approaches to minimize PPH. Jha also suggests that national-level, following provincial-level, consultations may be timely and highly useful in identifying feasible interventions and best practices.

Mahato and van Teijling[8] emphasize scaling up and expanding midwifery-led units to ensure sustained and timely care, which could help reduce maternal deaths. They assert that the approach implemented in Bangladesh may serve as valuable guidance.

Paudel and Amatya[9] underscore the significant gap between the health workforce and those available on the ground for providing maternal and related health services. They describe efforts undertaken by the Nick Simons Institute (NSI) in collaboration with the MoHP to address these challenges. They argue that well-tested and practical interventions, which yield the expected results, need to be scaled up.

Sharma[10] critically examines community-level monitoring and surveillance of maternal deaths, starting at the community level itself. His review emphasizes that while the available tools may be robust, significant challenges remain in ensuring their effective and efficient implementation. Among other concerns, this component of health system strengthening has not received the priority it deserves. Consequently, it remains weak, and many may view it as an additional burden on the service delivery system.

Nepal and Dangol[11] discuss another important aspect of the health system: the role of social accountability. They note that while social accountability is a critical tool for the health system to function effectively at the community level, its implementation and monitoring have often been weak. Consequently, it is far from achieving its objective in terms of making the local community more responsible, which in turn could aid in improving not only maternal health-care services, but also health services more broadly.

Rimal and Khadka[12] share the story of a young mother who gave birth at a hill district hospital. They describe how a potentially fatal case was averted by performing a peripartum hysterectomy. This case study demonstrates not only the importance of making the challenging decision at the right time, but also the importance of having a critical support system at the hospital, which includes a functioning operating system with the necessary human resources and an administrative support system.

In addition to the commentaries included here, there are undoubtedly many other aspects and dimensions that need to be explored for deeper insight into the issues and potential interventions to address those. We hope these commentaries contribute to our collective efforts to a better understanding of actionable interventions and solutions to reduce maternal mortality in Nepal.

As the trend reviewed here shows, Nepal has made sustained progress in reducing maternal deaths, and many factors have contributed to this change over the years,[13] but the pace must accelerate. Critical reviews of periodic assessments/evaluations, identification of new approaches, fine-tuning of existing practices, and the adoption of new technologies, may facilitate faster progress.

The Europasian Journal of Medical Sciences (EJMS) thanks the contributors of this collection for their time and efforts. The Nepal Government's National Statistical Office, Ministry of Health and Population, and all other stakeholders involved in undertaking the maternal mortality study also deserve our appreciation for their leadership, investment, and accomplishments.

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