



# The Shortage of Obstetric Ultrasound Facilities in Nepal: Consequences and Mitigating Measures

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We write to highlight an issue that significantly affects maternal and perinatal health in low-income countries like Nepal: the extensive shortage of obstetric ultrasound facilities. The scarcity of such crucial medical services hampers the timely detection and treatment of various conditions, exacerbating mortality and morbidity rates and leading to dire consequences for affected women and their loved ones. Nepal has a per capita income of US\$1,034.<sup>1</sup> Its ailing health care infrastructure is a significant obstacle to providing high-quality maternal health care services.

Nepal is facing numerous challenges due to the absence of these essential services. It deprives mothers of timely detection and regular monitoring of high-risk pregnancies, making it difficult to identify conditions such as ectopic pregnancy, molar pregnancy, threatened or missed abortion, multifetal gestation, abnormal fetal development, intrauterine fetal death (IUFD), uterine rupture, and antepartum hemorrhage. The delay in diagnosis often poses a fatal threat to both the mother and the unborn child. Maternal mortality is one of the leading causes of death for women of reproductive age in Nepal, with the maternal mortality ratio found to be 151 per 100,000 live births.<sup>2</sup> Similarly, a study by Subedi et al<sup>3</sup> in Western Nepal identified prematurity as the most common cause of early neonatal deaths and preterm labor as the leading cause of perinatal deaths reflecting the entire country. In Nepal, perinatal mortality in 2016 was 31 per 1,000 total births,<sup>4</sup> and the neonatal mortality rate as of 2021 is 16 per 1,000 live births.<sup>5</sup>

According to a study by Wiafe et al,<sup>6</sup> the majority of these preventable deaths occur in underdeveloped nations, where

ultrasound imaging is currently underutilized. The main cause of this underutilization is financial difficulties. This research underscores ultrasound's value as a noninvasive, risk-free diagnostic technique that can help identify most high-risk pregnancies, minimize the effects of these issues, and, in some cases, guide treatment. Kongnyuy and van den Broek<sup>7</sup> also summarize that the benefits of diagnostic ultrasound in a resource-poor setting are well-known and undisputed.

Due to its relatively low cost of purchase, low cost of maintenance, portability, and durability when compared with other imaging modalities, ultrasound has been called a “sustainable technology” for developing countries.<sup>8</sup> Currently, the increasing availability of affordable and smaller ultrasound machines clearly indicates the sustainability of ultrasound for the developing world and its potential role in reducing maternal and perinatal mortality.<sup>9</sup>

Even a small effort can lead to considerable results in low-income countries like Nepal. For instance, Van Dyk et al<sup>10</sup> explained that even the accurate estimation of gestational age by ultrasound imaging has a notable impact in developing countries, as most of the pregnant women in those areas cannot recall their last menstrual period, probably due to high illiteracy rates. This makes them far more vulnerable to unrecognized preterm delivery and postmaturity syndromes.

Ultrasonography can easily distinguish findings such as a snowstorm pattern in complete molar pregnancy, a retained product of conception in incomplete abortion, the absence of fetal heartbeat, and a few peculiar findings in IUFD, placenta

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approximating or covering the cervical Os in placenta previa, abnormal uterine artery Doppler screen in preeclampsia, and abnormal fetal Doppler parameters in restricted fetal growth, and so on. For its profound impact, the availability of regular follow-up services is as important as the initial diagnosis.

An article by Choorakuttil et al<sup>11</sup> demonstrated that Samrakshan, an Indian Radiological and Imaging Association national program that integrated fetal Doppler imaging biomarkers with routine antenatal screening for pregnant women in India, significantly reduced preterm preeclampsia and the birth rate at the end of the program's 2 years. Neonatal, perinatal, and maternal mortality rates have all decreased dramatically. Undeniably, a program similar to Samrakshan can be a groundbreaking approach to Nepal's concerning perinatal and maternal health indices.

To address this critical issue, here are some potential mitigating measures: Health care authorities should prioritize the establishment of ultrasonography services in remote areas. Investing in training programs for health care professionals, including midwives, is crucial. Governments can partner with private entities leveraging resources from both sectors to provide accessible services. Similarly to the study by Choorakuttil et al,<sup>11</sup> it is critical to assess the impact of any initiatives on a regular basis to determine success and make any necessary adjustments. Teleradiology should be encouraged to facilitate health care professionals in remote areas. The international community should provide financial assistance, equipment donations, and expert guidance to low-income countries. We should collaborate to ensure that mothers and children in these developing countries receive the standardized care they deserve, regardless of their socioeconomic status.

#### Availability of Data and Materials

All data generated or analyzed during this study are included in this published article.

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#### Conflict of Interest

None declared.

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