

Estimation of Maternal Mortality Ratios in Bangladesh Using the State Space Model

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Abstract

Objective

The objective of this study was to predict when Bangladesh would achieve the goal of Target 3.1 of the Sustainable Development Goals, which is to reduce the maternal mortality ratio (MMR) to less than 70 per 100,000 live births.

Methods

Secondary data from the Bangladesh Demographic and Health Survey and other sources were used to project MMR until 2060 in Bangladesh with the ARMAX model. Variables were selected based on the three delays model, and a reference forecast; four alternative scenarios were created. The variable used in the scenarios was chosen to be the facility delivery rate. There are regional differences in institutional delivery rates, and the reference forecast; Scenario 3 takes into account regional differences by division.

Results

The best scenario, Scenario 1, was the earliest, with an MMR below 70 per 100,000 live births in 2026. Scenario 2, forecast based on the national strategy for 2019-2030, would be below 70 per 100,000 live births in 2029. The reference forecast had the third lowest MMR, with 69.78 per 100,000 live births (95% PI [32.44 to 107.11]) in 2049. Although the MMR for Scenario 3 had decreased slowly, the MMR had not fallen below 70 per 100,000 live births by 2060. Scenario 4, which had the highest MMR also resulted in MMR not falling below 70 per 100,000 live births until 2060.

Conclusion

To increase the institutional delivery rate and reduce the MMR as in Scenarios 1 and 2, it is necessary to improve the institutional delivery rate in regions with low institutional delivery rates, such as Sylhet, Mymensingh, and Barishal. Additionally, health facilities need to provide appropriate quality medical care in order for an increase in institutional delivery rate to contribute to a decrease in the MMR, as shown in the results of this study.