



## Factors Associated with Neonatal Mortality in Bangladesh: A Cross-Sectional Analysis of the Demographic and Health Survey 2014

*\*Mohammad Ashfikur Rahman<sup>1</sup>, Mohammad Sazedur Rahman<sup>2</sup>, Mohammad Hasan Howlader<sup>1</sup>*

1. *Development Studies Discipline, Social Science School, Khulna University, Khulna, Bangladesh*
2. *Statistics Discipline, Science, Engineering & Technology School, Khulna University, Khulna, Bangladesh*

**\*Corresponding Author:** Email: ashfikur@ku.ac.bd

(Received 13 Jul 2019; accepted 24 Jul 2019)

### Dear Editor-In-Chief

Infant and child mortality rate indicates a country's overall socio-economic and standard of living. Although, recent past Bangladesh achieved commendable success in reducing child and maternal mortality. Nevertheless, the prevalence rate of neonatal mortality dares to questions against the inserted health policy and nutritional programs. Beyond clinical causes, socio-biological causes of neonatal mortality deserve to be ascertained. After getting a baby born the neonatal period begins and ends with terminating 28 days of life (1). Associated factors of child mortality have been comprehensively examined in the demographic and epidemiological researches (2) and it is possible to draw an important conclusion that the child mortality has been dropping down in developing country. This had happened due to take intensive efforts like immunization, oral rehydration, vitamin A dose campaigns and so on. However, globally according to WHO 5.4 million under-five child died in 2017 whereas 2.5 million of those children died within first month (3). Child mortality as well as Under-five mortality rate (U5MR) remains an urgent concern particularly in developing countries like Bangladesh (4,5) although there is a declining trend has found in the WHO data of under-five, infant and neonatal

mortality rate (3). However, the truth is, the reduction of neonatal mortality rate (NMR) is slower than the other two types between the year 1990 and 2017 (3,4). Whereas, in 2015, approximately 5.9 million under-five (U5) children were died while 2.7 million (45%) of these babies died in their neonatal period (3,4,6).

Thus, identifying the associated risk factors for neonatal mortality was therefore considered the prime objective of this current study. The current study was based on Bangladesh Demographic and Health Survey 2014 dataset where a total of 7,886 child's information was assessed. Using multivariate logistic regression model, the associated risk factors for neonatal mortality was predicted.

A total of 7,886 child's individuals' information used in this study. Of the total 240 neonatal deaths, about 134(3.3% male children died whereas 106(2.8%) were female. More than two-thirds (5398/68.5%) participants (mother) participated from the rural area. 1233(15.6%) of mothers and (2008/25.5%) fathers did not have any formal education where approximately 41.1% respondents were poor and more than one-fourth (27.4%) fathers were worked directly in agricultural sectors. During pregnancy around (62.3%) of mothers received at least two ANC



during pregnancy. About (1.5%) children were multiple birth. The based year 2014 when neonatal mortality was (28/1000LBs) but in 2017 it has

found (18/1000 LBs) which means neonatal mortality has been decreasing in Bangladesh (Table 1).

**Table 1:** Risk perdition for infant mortality multivariate binary logistic regression analysis

<i>Characteristic</i>	$\beta$	<i>Neonatal mortality</i> <i>AOR (95% CI)</i>	<i>P-value</i>
Division			
Dhaka	-0.190	0.82(0.38-1.78)	0.629
Khulna	0.233	1.26(0.58-2.74)	0.556
Rajshahi	0.281	1.32(0.63-2.77)	0.456
Rangpur	-0.438	0.64(0.25-1.62)	0.351
Sylhet	0.383	1.46(0.75-2.85)	0.261
Barisal	-1.575	0.20(0.47-0.91)	0.038**
Chittagong (Ref.)		1	
<i>Mother's education</i>			
No education	-0.215	0.81(0.24-2.62)	0.721
Primary	-0.010	0.99(0.33-2.93)	0.986
Secondary	0.008	1.01(0.37-2.71)	0.987
Higher (Ref.)		1	
<i>Father's education</i>			
No education	1.19	3.30(1.07-10.16)	0.037**
Primary	0.890	2.43(0.84-7.05)	0.101
Secondary	0.502	1.64(0.59-4.60)	0.337
Higher (Ref.)		1	
<i>Exposure to television</i>			
No	0.339	1.40 (0.79-2.47)	0.241
Yes (Ref.)		1	
<i>Wealth index</i>			
Poor	-0.441	0.64 (0.35-1.18)	0.158
Middle	-0.225	0.79 (0.42-1.52)	0.496
Rich (Ref.)		1	
<i>Father's occupation</i>			
Agricultural sectors	0.165	1.18 (0.72-1.75)	0.502
Non-agricultural sectors (Ref.)		1	
<i>Antenatal care visit</i>			
No	0.586	1.79 (1.09-2.95)	0.021**
Yes (Ref.)		1	
<i>Mother's height (cm)</i>			
<145	0.489	1.63 (0.95-2.78)	0.072*
≥145 (Ref.)		1	
<i>Type of birth</i>			
Multiple birth	2.63	13.86 (5.10-37.65)	<0.001***
Single birth (Ref.)		1	
<i>Preceding birth interval</i>			
<24 months	2.319	10.16 (7.50-13.78)	<0.001***
≥24 months (Ref.)		1	
<i>Type of toilet</i>			
No facilities/ Hanging toilet	0.726	2.06 (1.01-4.19)	0.044**
Pit toilet/ Flush toilet (Ref.)		1	
<i>Delivery by caesarean</i>			
No	-0.005	0.99 (0.58-1.75)	0.985
Yes (Ref.)		1	
Reference Category: Alive			
***indicates significant at 1% level.			
**indicates significant at 5% level.			
*indicates significant at 10% level.			
AOR: Adjusted Odds Ratio; CI: Confidence interval; Ref.: reference.			

The multivariate model predicted the following risk factors which may increase the neonatal mortality rate. Father with no education (AOR: 3.72; CI=1.23-11.22); multiple birth order (AOR: 16.40; CI=6.15-43.75) and mothers with no ANC (AOR: 1.83; CI=1.15-2.90) conferred the risk factors for advancing neonates death. But why wealth index, mother's biological characteristics retained by the model which upholds further detailed study.

In fine the goal three of SDGs for child health, which determines to stall all kinds of preventable deaths of neonates and under-five aged children by 2030, may not be obtained without taking organized effort for reducing the neonatal mortality from developing countries like Bangladesh. The study suggested community-based interventions and health care seeking facilities must make sure for mothers and newborns.

### Conflict of interest

All authors declare no conflict of interest.

### References

1. Hill K, Choi Y (2006). Neonatal mortality in the developing world. *Demographic Research*, 14:429-52.
2. Rutstein SO (2000). Factors associated with trends in infant and child mortality in developing countries during the 1990s. *Bull World Health Organ*, 78(10):1256-70.
3. WHO (2018). Children: reducing mortality. 19 September 2018. Available from: <https://www.who.int/news-room/fact-sheets/detail/children-reducing-mortality>.
4. Alkema L, Chou D, Hogan D, et al (2016). Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *Lancet*, 387(10017):462-74.
5. Al Kibria GM, Khanam R, Mitra DK, et al (2018). Rates and determinants of neonatal mortality in two rural sub-districts of Sylhet, Bangladesh. *PLoS One*, 13(11):e0206795.
6. Liu L, Oza S, Hogan D, et al (2016). Global, regional, and national causes of under-5 mortality in 2000–15: an updated systematic analysis with implications for the Sustainable Development Goals. *Lancet*, 388(10063):3027-35.