

Original Article

Trend Analysis & Causes of Childhood Mortality (0-5 years) in a Medical College Hospital in Bangladesh

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**ABSTRACT:**

Background: Child mortality means the end of children under the age of five. The child mortality rate, also known as the under-five mortality rate, is the probability of dying between the ages of birth and five years, expressed as a percentage of 1,000 live births. **Objective:** The objective of the study is to explore the trends and causes of mortality in children aged within 0 to 5 years in a tertiary medical college hospital in Bangladesh. **Method:** It was a cross-sectional, quantitative, descriptive study conducted from September 2020- to August 2021 by sample size of 157. Both primary and secondary data was used for this study. **Results:** There were 89 male children and 68 female children out of a total of 157. Intrauterine hypoxia and birth asphyxia were shown to be the leading causes of child death in both male and female children. Intrauterine hypoxia and birth asphyxia caused 29 of 68 female children and 40 of 89 male children death. **Conclusion:** Bangladesh's child

mortality rate in 2020 was 28.95 deaths per thousand live births. Bangladesh's child mortality rate has declined over the last fifty years, going from 244.68 deaths per thousand live births in 1971 to 28.95 deaths per thousand live births in 2020. More investigations are also advised to learn more about the particular causes of child death.

Keywords: Childhood mortality, Causes, Trend analysis

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INTRODUCTION

The mortality of children under the age of five is referred to as child mortality. The child mortality rate, commonly known as

the under-five mortality rate, is the likelihood of dying between the ages of birth and five years, represented as a

proportion of 1,000 live births¹. It includes both neonatal and infant mortality (the probability of death in the first year of life)^{1,2}. Over the last three decades, the globe has achieved great improvement in child survival, and millions of children now have higher prospects of life than in 1990—1 in 27 children died before reaching the age of five in 2019, compared to 1 in 11 in 1990. Furthermore, progress in decreasing child death rates has increased during the 1990s, with the yearly rate of reduction in the worldwide under-five mortality rate growing from 1.9% in 1990–1999 to 3.7% in 2000–2019². 5.2 million Children under the age of five died in 2019. In 2019, this equates to 14,000 children under the age of five dying every day. Infectious disorders such as pneumonia, diarrhoea, and malaria, as well as premature delivery and intrapartum complications, continue to be the primary causes of mortality among children under the age of five across the world². From 93 deaths per 1,000 live births in 1990 to 38 deaths per 1,000 live births in 2019, the worldwide under-five mortality rate has decreased by 59%. Despite this significant gain, ensuring child survival remains a major concern. Every day in 2019, around 14,000 children under the age of five died, an unacceptably high number of entirely preventable child fatalities².

Over the last few decades, Bangladesh has seen a considerable drop in child mortality, contributing to the achievement of Millennium Development Goal 4 (MDG 4) targets. However, mortality among children under the age of five remains high, and achieving the Sustainable Development Goal (SDG) objective and slowing the current rate of under-5 mortality would need a significant effort. It is therefore critical to investigate the trend and causes of under-five mortality at this time in order to lessen the vulnerability of children's survival. According to the BDHS (2014) statistics, the newborn death rate is 28 / 1000 live births, representing a 46 percent decrease in neonatal mortality from 1989 to 1993. Despite the fact that newborn and

under-five mortality rates have decreased, 61 percent of under-five fatalities and 74 percent of infant deaths occurred during the neonatal period¹¹. In order to reduce under-five and newborn mortality rates, it is anticipated to focus on neonatal mortality. It's also worth noting that neonatal mortality (46%) decreased at the slowest rate between 1989 and 2014, compared to under-five (65%) and infant mortality (56%) deaths¹¹. To meet the health, nutrition, and population sector program's target of 21 newborn deaths per 1000 live births by 2021, the rate of reduction in neonatal fatalities should be expedited¹². Reduce newborn mortality to at least 12 deaths /1,000 live births and under-five mortality to at least 25 deaths / 1,000 live births, according to the third Sustainable Development Goal (SDG). It is critical to determine the factors that influence under-five and newborn mortality in Bangladesh in order to meet the SDG 3 target. Improved child health is required to support the country's growth and well-being by lowering neonatal, infant, and under-five mortality rates¹³.

Various research has been undertaken across the world to determine the factors that influence neonatal, child, and under-five mortality. Cox regression analysis was used by Nisar and Dibley (2014) to identify the risk factors for neonatal death in Pakistan¹⁴. They discovered that 68% of infant fatalities happened in the first month of life between 2002 and 2006, with 33% occurring on the first day and 73% occurring in the first week, Male infants, lower than average birth size, and delivery difficulties were all linked to a higher risk of neonatal death¹⁴. In Nepal by using logistic regression, Khadka et al. (2015) explored the socio-economic factors of infant mortality. Between 2006 and 2010, the infant mortality rate was 46 per 1000 live births, according to their research, rural regions have a greater infant mortality rate than urban areas. The Infant mortality rate in middle-class families was higher than wealthiest households¹⁵. Nasejje et al. (2015) examined

the factors influencing under-five mortality in Uganda and got result by fitting the Cox-proportional hazard model with frailty effects and drawing inference using both the frequentists and Bayesian approaches at 5 % significance level. They found that Uganda has not met the MDG4 target, but the reduction in the UMR of 52 % is a step in the right direction. High UMR is significantly linked to demographic characteristics (household head's gender) and biological determinants (child's gender and number of births in the previous year). At the home level, heterogeneity or unobserved variables were shown to be significant, but not at the community level¹⁶. Several research have been undertaken in Bangladesh to investigate the drivers of neonatal, infant, and under-five mortality in order to boost socioeconomic development and quality of life. Chowdhury (2013) used Cox Proportional Hazard Analysis to determine the causes of under-five mortality in Bangladesh. In his study, the location of residency and the mother's age were determined to be major determinants influencing under-five mortality¹⁷. Kamal et al. (2012) identified maternal age, maternal education, and birth order as possible risk factors for neonatal death¹⁸. Hossain and Islam (2008) investigated the socioeconomic factors that influence baby and child mortality. It was discovered in this study that a mother's education, medical checkups during pregnancy, and watching TV were important variables influencing newborn, child, and under-five mortality¹⁹. Fatima et al. (2016) applied a log-logistic parametric survival regression model to find that the age of the mother at birth, maternal education, gender of the child, size of the child at birth, place of delivery, and participation in an NGO all have a significant impact on infant mortality²⁰. Rahman (2008) used the Cox proportional hazard model to analyze BDHS data and discovered that the site of birth, mother education, source of drinking water, household electrical facility, and household assets index all had a part in lowering the child death rate²¹.

Between 1980 and 2015, India reduced the number of children under the age of five who died of diarrhea by 86 %⁵. In Tanzania, diarrhea-related mortality among children under the age of five has decreased by 89%,

from 35.3 deaths per 1000 live births in 1980 to 3.9 deaths per 1000 live births in 2015⁶.

In this study we try to explore the trends and causes of mortality in children aged 0 to 5 years in tertiary medical college hospital in Bangladesh.

METHOD AND MATERIAL

It was a cross-sectional, quantitative, descriptive study conducted from September 2020- to August 2021 by sample size of 157. Data was collected from Shaheed Tajuddin Ahmad Medical College Hospital, Gazipur, Bangladesh as well as secondary data also used.

RESULT

The result shows the gender wise mortality rate from total sample size of 157. Table I and II shows the mortality scenario of early child aged group between 0-5 years. Most of the female child had died due to Intrauterine hypoxia and birth asphyxia. Out of 68 female child it has been reported that 29 children had died due to Intrauterine hypoxia and birth asphyxia. 17 children have been reported died due to prematurity. Every year, 15 million babies are born prematurely around the world. As female children same mortality scenario had shown in male children. Out of 86 male child death 40 male children were died due to Intrauterine hypoxia and birth asphyxia and 30 male children were died due to prematurity. In female child no death case had found for Meningitis and Other diseases of the nervous system. In male child no death case had found for unspecified poisoning.

Prematurity has surpassed malnutrition as the biggest cause of newborn fatalities worldwide, with over 1 million deaths per year. Preterm birth rates are rising over the world, accounting for 35 percent of all neonatal deaths; it is the second-leading cause of death among children under the age of five, after pneumonia⁷.

Table I: Female Child mortality according to disease burden

| Disease | Sep'20- Nov'20 | Dec'20- Feb'21 | Mar'21- May'21 | Jun'21- Aug'21 | Total | |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|--------------|
| Septicaemia | 1 | 1 | 1 | 0 | 3(4.41%) | |
| Anaemias | 0 | 0 | 1 | 0 | 1(1.47%) | |
| Pneumonia | 3 | 2 | 2 | 0 | 7(10.29%) | |
| Prematurity | 3 | 1 | 4 | 9 | 17(25%) | N= 68 |
| Low birth weight | 1 | 1 | 0 | 2 | 4(5.88%) | |
| Intrauterine hypoxia and birth asphyxia | 8 | 5 | 9 | 7 | 29(42.64%) | |
| Congenital malformations of the heart | 1 | 4 | 0 | 1 | 6(8.82%) | |
| Other and unspecified poisoning | 0 | 0 | 0 | 1 | 1(1.47%) | |
| Meningitis | 0 | 0 | 0 | 0 | 0(00%) | |
| Other diseases of the nervous system | 0 | 0 | 0 | 0 | 0(00%) | |

Table II: Male Child mortality according to disease burden

| Disease | Sep'20- Nov'20 | Dec'20- Feb'21 | Mar'21- May'21 | Jun'21- Aug'21 | Total | |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------|
| Septicaemia | 1 | 1 | 1 | 3 | 6(6.74%) | |
| Anaemias | 0 | 0 | 1 | 0 | 1(1.12%) | |
| Pneumonia | 1 | 0 | 3 | 0 | 4(4.49%) | |
| Prematurity | 4 | 10 | 7 | 9 | 30(33.70%) | N=89 |
| Low birth weight | 0 | 1 | 0 | 1 | 2(2.24%) | |
| Intrauterine hypoxia and birth asphyxia | 11 | 5 | 16 | 8 | 40(44.94%) | |
| Congenital malformations of the heart | 0 | 1 | 0 | 2 | 3(3.37%) | |
| Other and unspecified poisoning | 0 | 0 | 0 | 0 | 0(0%) | |
| Meningitis | 0 | 0 | 0 | 1 | 1(1.12%) | |
| Other diseases of the nervous system | 0 | 1 | 1 | 0 | 2(2.24%) | |

Table III shows the child mortality scenario of Bangladesh for last 20 years.

Child mortality of Bangladesh is decreasing from 2000 to 2021. In 2000 annual child

mortality rate was 64.37 Deaths per 1000 Live Births with Annual % Change -4.4% and it fall 23.672 Deaths per 1000 Live Births with Annual % Change -4.28 in 2021⁸.

Table 1: Bangladesh Infant Mortality Rate 2000-2021

| YEAR | DEATHS PER 1000 LIVE BIRTHS | ANNUAL % CHANGE |
|------|-----------------------------|-----------------|
| 2000 | 64.37 | -4.4 |
| 2001 | 61.406 | -4.6 |
| 2002 | 58.441 | -4.83 |
| 2003 | 55.476 | -5.07 |
| 2004 | 53.044 | -4.38 |
| 2005 | 50.612 | -4.58 |
| 2006 | 48.179 | -4.81 |
| 2007 | 45.747 | -5.05 |
| 2008 | 43.315 | -5.32 |

| | | |
|------|--------|-------|
| 2009 | 41.283 | -4.69 |
| 2010 | 39.251 | -4.92 |
| 2011 | 37.218 | -5.18 |
| 2012 | 35.186 | -5.46 |
| 2013 | 33.154 | -5.78 |
| 2014 | 31.892 | -3.81 |
| 2015 | 30.631 | -3.95 |
| 2016 | 29.369 | -4.12 |
| 2017 | 28.108 | -4.29 |
| 2018 | 26.846 | -4.49 |
| 2019 | 25.788 | -3.94 |
| 2020 | 24.73 | -4.1 |
| 2021 | 23.672 | -4.28 |

Source: 'https://www.macrotrends.net/countries/BGD/bangladesh/infant-mortality-rate'>Bangladesh Infant Mortality Rate 1950-2021.www.macrotrends.net.Retrieved 2021-11-19

Error! Reference source not found. shows the graphical scenario of child mortality scenario of Bangladesh for last 20 years (2000-2021).

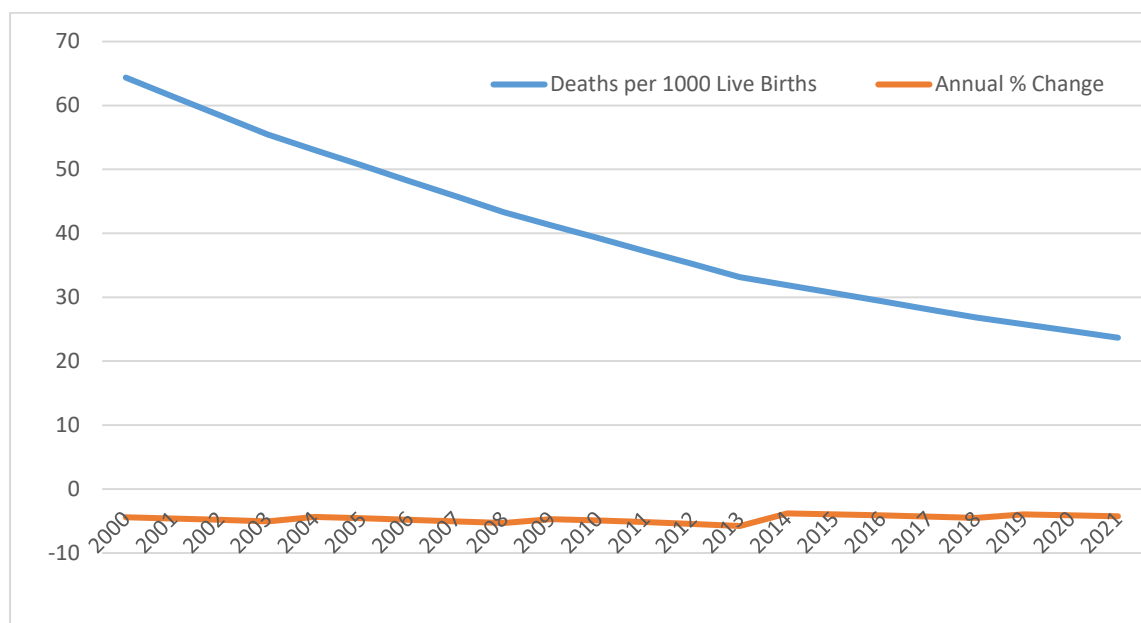


Figure 1: Bangladesh Infant Mortality Rate 2000-2021

Source: 'https://www.macrotrends.net/countries/BGD/bangladesh/infant-mortality-rate'>Bangladesh Infant Mortality Rate 1950-2021.www.macrotrends.net.Retrieved 2021-11-19

DISCUSSION:

The proposed SDG target for child mortality aims to eliminate preventable deaths of newborns and children under the age of five by 2030, with all countries aiming to reduce neonatal mortality to at least 12 deaths per 1,000 live births and under-5 mortality to at least 25 deaths per 1,000 live births. Over the past fifty years, Bangladesh's child mortality rate has

moderated, falling from 244.68 deaths per thousand live births in 1971 to 28.95 deaths per thousand live births in 2020¹⁰. Bangladesh's current infant mortality rate in 2021 is 23.672 deaths per 1000 live births, a 4.28% decrease from 2020. Bangladesh's infant mortality rate in 2020 was 24.730 deaths per 1000 live births, a 4.1% decrease from 2019⁸. The majority of the death cases

among 68 females were related to intrauterine hypoxia and birth asphyxia, while the same causes of mortality were reported in 89 males. In both cases, the highest number of fatality cases were identified between March 21 and May 21, indicating that it is rainy season. Child mortality of Bangladesh is decreasing from 2000 to 2021. In 2000 annual child mortality rate was 64.37 Deaths per 1000 Live Births with Annual % Change -4.4% and it fall 23.672 Deaths per 1000 Live Births with Annual % Change -4.28 in 2021.

CONCLUSION:

Bangladesh has made substantial progress in achieving Millennium Development Goals 4. Since 1990, child mortality has dropped considerably, with an estimated 57 percent decline in child mortality. Bangladesh's pace of lowering child death is much too rapid, and it is hoped that if this trend continues, Bangladesh would reach the SDG target of less than 12 child mortality by 2030.

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