

Chlorhexidine Coverage for Newborn Umbilical Cord Care in Bangladesh and Nepal

Background

Reducing neonatal mortality is a pressing global health issue. In 2022, it was estimated that there were 2.3 million deaths among children under one month old (UNIGME, 2023). Infection is among the leading causes of neonatal mortality, including omphalitis, which is an infection of the umbilical cord. Hygienic cord care is an important means of preventing newborn infections and death. In 2022, the World Health Organization (WHO) recommended chlorhexidine for newborn umbilical cord care for the first week of life in settings where potentially harmful substances are often applied. In other settings, clean and dry cord care is being promoted (WHO, 2022). This policy brief summarizes findings from a paper by Singh et al. (2024), which looked at coverage and factors associated with receipt of chlorhexidine for newborn umbilical cord care in Bangladesh and Nepal.



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Countries Included in this Assessment

Bangladesh and Nepal were chosen for this analysis because they have long-standing policies promoting chlorhexidine for newborn umbilical cord care and have population-level data available. In 2011, Nepal became the first country to promote chlorhexidine for newborn umbilical cord care, and a scale-up phase began in 2014 (USAID, 2015; JSI, 2017). Bangladesh's policy began in 2014 and was initially focused on health facilities (HNN, 2019). In both countries, a single dose of chlorhexidine application after birth is promoted (Callaghan-Koru et al., 2019; Zaman et al., 2021), unlike the WHO policy, which indicates that chlorhexidine should be applied for the first week of life (WHO, 2022). Neonatal mortality in both Bangladesh and Nepal currently stands at 16 neonatal deaths per 1,000 live births (UNIGME, 2023).

Methods

This study used data from the 2017–2018 Bangladesh Demographic and Health Survey (DHS) and the 2016 Nepal DHS. We restricted our sample to women of reproductive age who had a live birth in the past year. Our sample included 1,690 mother-infant pairs in Bangladesh and 961 mother-infant pairs in Nepal. The outcome variable was receipt of chlorhexidine after birth (yes/no). The independent variables were classified into socioeconomic, biologic, and healthcare factors. The socioeconomic factors included maternal education, wealth index, religion, urban/rural residence, and subnational level residence. The biological variables were maternal age, parity of the child, and biological sex of the child. The healthcare-related variables were four or more antenatal care (ANC) visits, health facility delivery, cesarean section, application of a harmful substance to the cord, and application of another nonharmful substance to the cord (excluding chlorhexidine).

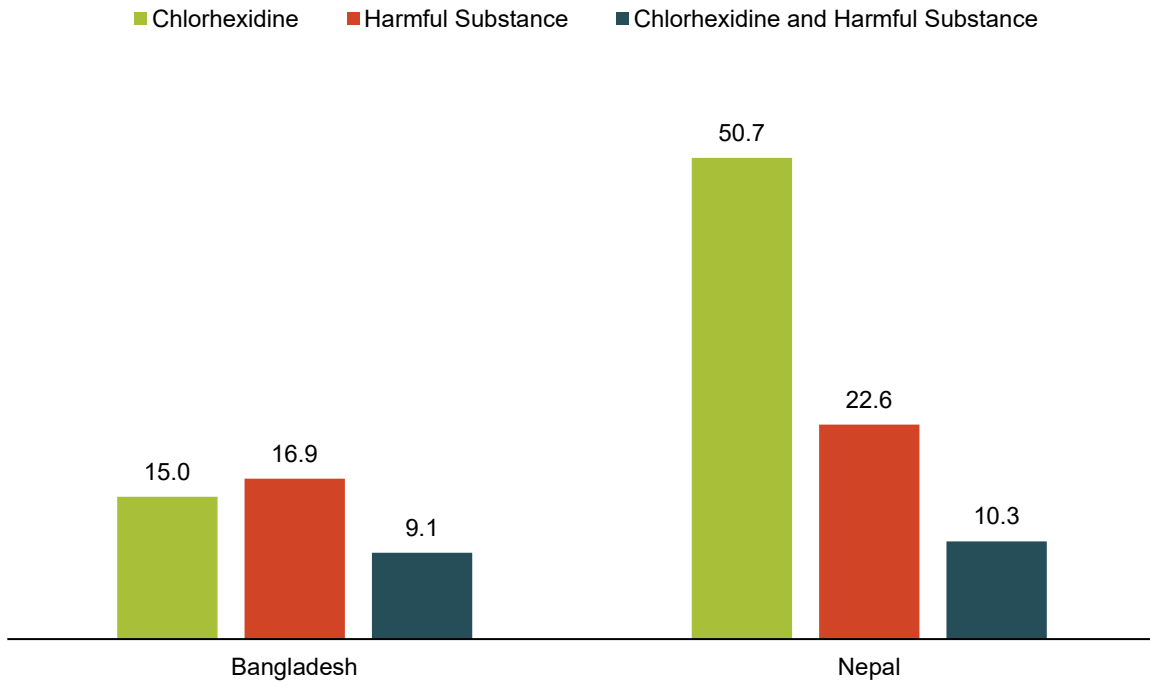
Descriptive, bivariate, and multivariable analyses were conducted separately for each country. Analyses were conducted using Stata 17.



Key Results

In Figure 1, we present descriptive data for newborns receiving chlorhexidine, a harmful substance, and both chlorhexidine and a harmful substance. In Bangladesh, 15% of newborns received chlorhexidine, 16.9% had a harmful substance applied, and 9.1% received both. In Nepal, 50.7% of newborns received chlorhexidine, 22.6% had a harmful substance applied, and 10.3% received both.

Figure 1. Percentages of newborns receiving either chlorhexidine, a harmful substance, or both in Bangladesh and Nepal



The multivariable regression analyses yielded some key findings, as summarized in Table 1. Health facility delivery was significantly and positively associated with receipt of chlorhexidine in both countries (Bangladesh: OR=2.39, $p=0.002$; Nepal: OR=4.79, $p=0.000$). Newborns born by cesarean section had an increased odds (64%) of receiving chlorhexidine compared to those born vaginally in Bangladesh (OR=1.64, $p=0.029$). Having four or more ANC visits was associated with the receipt of chlorhexidine in Nepal (OR=2.39, $p=0.000$). Another nonharmful substance being applied to the umbilical cord was significantly and positively associated with the receipt of chlorhexidine for newborns in Bangladesh (OR=1.49, $p=0.025$), while the application of a harmful substance was negatively and significantly associated with the receipt of chlorhexidine for newborns in Nepal (0.46, $p=0.001$). Wealth was not significant for Bangladesh, but newborns in the highest wealth quintiles were significantly less likely to receive chlorhexidine than those born in the lowest wealth quintile (richer: OR=0.38, $p=0.001$; richest: OR=0.46, $p=0.020$).



Table 1. Multivariable logistic regression for receipt of chlorhexidine controlling for key variables

| Variables | Bangladesh (OR, p value) | Nepal (OR, p value) |
|---|-----------------------------|------------------------|
| Wealth | | |
| Poorest | Ref | Ref |
| Poorer | 1.11 (0.678) | 0.84 (0.497) |
| Middle | 1.23 (0.455) | 1.02 (0.937) |
| Richer | 1.08 (0.783) | 0.38 (0.001) |
| Richest | 1.35 (0.327) | 0.46 (0.020) |
| Four or more ANC visits | | |
| <4 | Ref | Ref |
| 4+ | 0.86 (0.399) | 2.39 (0.000) |
| Health facility delivery | | |
| Non-health facility | Ref | Ref |
| Health facility | 2.39 (0.002) | 4.79 (0.000) |
| C-section delivery | | |
| No | Ref | Ref |
| Yes | 1.64 (0.029) | 1.19 (0.590) |
| Other nonharmful substance applied | | |
| No | Ref | |
| Yes | 1.49 (0.025) | N/A |
| Harmful substance applied | | |
| No | Ref | Ref |
| Yes | 0.96 (0.889) | 0.46 (0.001) |

Note: The analysis also controlled for maternal age at birth, parity, gender of the child, mother's highest level of education, residence (urban/rural), religion, and subnational levels.

Policy Implications

Given the significant association between health facility delivery and receipt of chlorhexidine, it is important for countries to think about community-based approaches for reaching newborns not born in a health facility. Wealthier newborns were not more likely to receive this intervention. Thus, chlorhexidine for newborn care may have the potential to be an equitable intervention. More research is needed on why some newborns are still receiving a harmful substance or both a harmful substance and chlorhexidine.



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