

The State of Essential Newborn Care by Delivery Location in Bangladesh

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Abstract *Introduction* Essential newborn care (ENC) around the time of birth is critical in improving neonatal survival. There is currently a gap in our knowledge of the use of ENC by place of delivery in Bangladesh. This study assesses the provision of ENC and examines the odds of newborns receiving ENC by different levels of delivery care in Bangladesh. *Methods* Descriptive statistics and logistic regressions were performed on ENC practices from the 2011 Bangladesh Demographic and Health Survey dataset. ENC practices included nonapplication of substances to the cord; application of antiseptic to the cord; drying newborn within 5 min; wrapping newborn within 5 min; delaying first bath until the first 72 h; and breastfeeding within 1 h. Key predictors included home delivery with a lay attendant, delivery with primary healthcare services and delivery with higher-level healthcare services. *Results* Coverage of ENC practices was low. Women who delivered with primary and higher-level healthcare services generally reported greater odds of their newborns receiving recommended ENC than women who had home delivery with a lay attendant, the referent category. However, the odds of delayed first bath until 72 h and breastfeeding within 1 h were not statistically different for newborns who were delivered with primary healthcare services. *Discussion* These findings have significant public health implications as primary healthcare facilities are the first point of entry into the healthcare system. Provision of ENC, particularly delayed first bath until 72 h

and breastfeeding within 1 h, should be encouraged for all healthy mother-newborn pairs in Bangladesh.

Keywords Essential newborn care (ENC) · Thermal care · Breastfeeding · Institutional delivery · Primary healthcare

Significance

The mainstream intervention approach for improving ENC in Bangladesh has mostly been community-based, targeting deliveries occurring at home. Two main types of community-based interventions have been implemented: home visits by trained community health workers and women's groups to promote behavior change. Studies of these interventions most frequently reported positive improvements in appropriate feeding, thermal care and cord care. This study examines ENC use and odds of newborns receiving ENC by different levels of delivery care and highlights specific ENC practices such as delayed first bath and breastfeeding within 1 h that need more emphasis in primary and higher-level healthcare facilities.

Introduction

Essential newborn care (ENC), defined as care provided soon after birth, is critical in improving neonatal survival (World Health Organization [WHO] 2014). ENC practices at or immediately after birth include newborns receiving hygienic cord care during delivery to prevent infection, adequate thermal protection after delivery via delayed bathing, immediate drying and wrapping and skin-to-skin contact to prevent hypothermia and immediate breastfeeding

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because of the many benefits including colostrum (Partnership for Maternal, Newborn & Child Health 2011).

Mainstream interventions for improving ENC in Bangladesh have mostly been community-based, targeting deliveries occurring at home (Azad et al. 2010; Baqui et al. 2008; Darmstadt et al. 2010; Fottrell et al. 2013; Rahman et al. 2015, 2011a; Sloan et al. 2008; Syed et al. 2006), due to the high proportion of home deliveries assisted by unskilled birth attendants (Barnett et al. 2006; Choudhury et al. 2012; Fronczak et al. 2007; Moran et al. 2009; National Institute of Population Research and Training [NIPORT], Associates, & ICF International 2013; Pagel et al. 2014; Rahman et al. 2011b) and prevailing cultural beliefs about newborn care (Choudhury et al. 2012; Fronczak et al. 2007; Moran et al. 2009; Rahman et al. 2011b; Winch et al. 2005). The proportion of unskilled delivery among home births was as high as 96% in 2011 (NIPORT et al. 2013). The literature reports several unsafe newborn care practices routinely performed by traditional birth attendants, such as unsterile cord cutting, application of substances to the cord, leaving the newborn wet and unwrapped and bathing the newborn early (Choudhury et al. 2012; Darmstadt et al. 2006; Moran et al. 2009; Winch et al. 2005). In addition, the cultural belief that mothers and newborns need to be cleansed from evil spirits often leads to behaviors, such as restricting the mobility of the mother and the newborn in their home and preventing outsiders from visiting them (Winch et al. 2005), that increase the risk of neonatal mortality and morbidity (Choudhury et al. 2012; Darmstadt et al. 2006; Moran et al. 2009; Winch et al. 2005).

Studies of community-based interventions in Bangladesh have reported some success in overcoming these barriers and improving ENC practices at home (Azad et al. 2010; Baqui et al. 2008; Darmstadt et al. 2010; Fottrell et al. 2013; Rahman et al. 2015, 2011a; Sloan et al. 2008; Syed et al. 2006). Two main types of community-based interventions have been implemented, one focused on home visits by trained community health workers (Azad et al. 2010; Baqui et al. 2008; Darmstadt et al. 2010; Rahman et al. 2015, 2011a; Sloan et al. 2008; Syed et al. 2006), and the other on working with women's groups to promote behavior change (Azad et al. 2010; Fottrell et al. 2013). For both types of interventions, the use of recommended ENC practices at or immediately after birth showed improvement in the intervention arms compared to the control arms of receiving usual care (Azad et al. 2010; Baqui et al. 2008; Darmstadt et al. 2010; Fottrell et al. 2013; Rahman et al. 2015, 2011a; Sloan et al. 2008; Syed et al. 2006). These studies most frequently reported positive improvements in the areas of appropriate feeding, thermal care and cord care (Azad et al. 2010; Baqui et al. 2008; Darmstadt et al. 2010; Fottrell et al. 2013; Rahman et al. 2015, 2011a; Sloan et al. 2008; Syed et al. 2006).

The current body of literature seems to be lacking, however, in assessments of ENC practices in health facilities. Some community-based interventions did include trainings for facility-based providers, but their impact on ENC practices is not reported (Azad et al. 2010; Fottrell et al. 2013; Rahman et al. 2015, 2011a).

To date, only a small number of studies describe the current state of ENC practices in health facilities in South Asia, particularly Bangladesh (Crowe et al. 2015; Hoque et al. 2012; Pagel et al. 2014; Rubayet et al. 2012). Pagel et al. (2014) notes that the implementation of ENC practices in health facilities across study areas in rural South Asia, including Bangladesh, is not universal. Reporting of recommended breastfeeding practices and thermal care was either low or moderate among facility deliveries in Bangladesh (Pagel et al. 2014). The proportions of women reporting immediate breastfeeding within 1 h and immediate wiping within 10 min among facility deliveries were 40% and 66%, respectively (Pagel et al. 2014). The proportion of women reporting delayed bathing for at least 6 h was much higher at 98% (Pagel et al. 2014). However, this measure, along with wiping within 10 min, is more lenient than the corresponding recommendations, which are wiping within 5 min and delayed bathing for at least 72 h (NIPORT et al. 2013).

Low and inconsistent use of ENC practices in health facilities poses a serious concern as the proportion of facility deliveries rises in Bangladesh, as it did from 2004, when the proportion was 12%, to 2011, when it had risen to 29% (NIPORT et al. 2013). As increasing facility delivery coverage remains a national priority (NIPORT, MEASURE Evaluation, & International Centre for Diarrhoeal Disease Research, Bangladesh 2012; Ministry of Health and Family Welfare [MHFW] 2011), it is important that ENC practices in health facilities receive just as much attention as ENC practices at home. This study therefore has the following objectives: (1) assessing the use of ENC practices performed at or immediately after birth and (2) examining the odds of newborns receiving ENC by three levels of delivery care (home delivery with a lay attendant, delivery with primary healthcare services and delivery with higher-level healthcare services) in Bangladesh.

Methods

Data and Sample

Data came from the 2011 Bangladesh Demographic and Health Survey (BDHS). A detailed description of the sampling method can be found elsewhere (NIPORT et al. 2013). This study only included women who had given birth in the year prior to the time of the survey ($n = 1853$).

This study received “Not Human Subjects Research” status by the University of North Carolina at Chapel Hill Institutional Review Board.

Descriptive and Regression Analyses

Descriptive statistics and Chi square tests were performed on demographic (Table 1) and outcome variables (Table 2) stratified by level of delivery care. Three levels of delivery care are defined: home delivery with a lay attendant, delivery with primary healthcare services and delivery with higher-level healthcare services. Demographic variables

included women’s age, women’s education, women’s parity, household wealth, urban or rural residence and women’s employment. Household wealth was constructed using household asset data via principal components analysis (NIPORT et al. 2013). Urban residence was defined as living in a capital city, a city with a population of over 1 million, a city with a population of over 50,000 or another urban town. Rural residence was defined as living in a countryside (United States Agency for International Development [USAID] & MEASURE Evaluation/ICF International 2013). Women’s employment was assessed according to whether the respondent was working outside the

Table 1 Characteristics of the sample by level of delivery care

	Total ^a		Level of delivery care ^b					
			Home delivery with lay attendant		Delivery with primary healthcare		Delivery with higher-level healthcare	
	n	% or Mean ± SD	n	% or Mean ± SD	n	% or Mean ± SD	n	% or Mean ± SD
Age ^c	1810	23.37 ± 5.37	1139	23.47 ± 5.59	196	22.31** ± 4.78	475	23.57 ± 5.04
Education								***
No education	588	32.49%	476	41.79%	41	20.92%	71	14.95%
Primary education	973	53.76%	603	52.94%	118	60.20%	252	53.05%
Secondary education or higher	249	13.76%	60	5.27%	37	18.88%	152	32.00%
Parity								***
1	697	38.51%	361	31.69%	96	48.98%	240	50.53%
2	520	28.73%	318	27.92%	65	33.16%	137	28.84%
3	309	17.07%	214	18.79%	23	11.73%	72	15.16%
4+	284	15.69%	246	21.60%	12	6.12%	26	5.47%
Wealth								***
Poorest	391	21.60%	336	29.50%	24	12.24%	31	6.53%
Poorer	336	18.56%	261	22.91%	25	12.76%	50	10.53%
Middle	353	19.50%	236	20.72%	33	16.84%	84	17.68%
Richer	381	21.05%	193	16.94%	60	30.61%	128	26.95%
Richest	349	19.28%	113	9.92%	54	27.55%	182	38.32%
Residence								***
Urban	539	29.78%	238	20.90%	94	47.96%	207	43.58%
Rural	1271	70.22%	901	79.10%	102	52.04%	268	56.42%
Employment								
No	1717	94.86%	1091	95.79%	182	92.86%	444	93.47%
Yes	93	5.14%	48	4.21%	14	7.14%	31	6.53%
Caesarean sections								***
No	1464	80.88%	1139	100.00%	154	78.57%	171	36.00%
Yes	346	19.12%	0	0.00%	42	21.43%	304	64.00%

The table includes sample from regression on breastfeeding within 1 h because it contained the largest number of observations out of all regression samples

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^aColumns within a categorical variable sum to 100%

^bChi-square tests were conducted for all categorical variables

^cA t-test was conducted for age where home delivery with lay attendant was used as a reference for the other two categories

Table 2 Use of immediate essential newborn care practices by level of delivery care

	Total ^a		Level of delivery care ^b					
			Home delivery with lay attendant		Delivery with primary healthcare		Delivery with higher-level healthcare	
	n	% or Mean ± SD	n	% or Mean ± SD	n	% or Mean ± SD	n	% or Mean ± SD
Application of substances to the cord								***
No	748	54.48%	644	57.97%	54	42.86%	50	36.76%
Yes	625	45.52%	467	42.03%	72	57.14%	86	63.24%
Application of antiseptic to the cord ^c								***
No	476	76.28%	385	82.62%	47	65.28%	44	51.16%
Yes	148	23.72%	81	17.38%	25	34.72%	42	48.84%
Drying newborn within 5 min								***
No	658	45.44%	563	49.82%	54	35.76%	41	24.55%
Yes	790	54.56%	567	50.18%	97	64.24%	126	75.45%
Wrapping newborn within 5 min								***
No	949	65.45%	777	68.64%	83	54.97%	89	53.29%
Yes	501	34.55%	355	31.36%	68	45.03%	78	46.71%
Delayed first bath until after the first 72 h								***
No	1030	72.23%	845	76.13%	102	67.11%	83	50.61%
Yes	396	27.77%	265	23.87%	50	32.89%	81	49.39%
Breastfeeding within 1 h								***
No	931	51.44%	546	47.94%	99	50.51%	286	60.21%
Yes	879	48.56%	593	52.06%	97	49.49%	189	39.79%
All immediate ENC practices ^d								**
No	1283	96.76%	1048	97.49%	115	94.26%	120	93.02%
Yes	43	3.24%	27	2.51%	7	5.74%	9	6.98%

The table includes sample from regression on breastfeeding within 1 h because it contained the largest number of observations out of all regression samples

*p < 0.05; **p < 0.01; ***p < 0.001

^aColumns within a categorical variable sum to 100%

^bChi-square tests were conducted for all categorical variables

^c“No” responses indicate that the respondents applied other substances to the cord such as antibiotics, spirit/alcohol, mustard oil with garlic, chewed rice, turmeric juice/powder, ginger juice, shidur, boric powder, gentian violet, talcum powder, ash/cow dung, heat, mustard oil and other unknown substances

^dAll immediate ENC practices include nonapplication of substances to the cord or application of antiseptic to the cord, drying newborn within 5 min, wrapping newborn within 5 min, delayed first bath until after the first 72 h and breastfeeding within 1 h

home at the time of the survey. Outcome variables included recommended ENC practices at or immediately after birth such as nonapplication of substances to the cord, application of antiseptic to the cord, drying the newborn within 5 min, wrapping the newborn within 5 min, delaying the newborn’s first bath until after the first 72 h of delivery and breastfeeding within 1 h (MHFW 2009; NIPORT et al. 2013). All of the ENC questions except breastfeeding within 1 h were only asked to women who had vaginal births (NIPORT et al. 2013). Women who had deliveries by caesarean sections were not asked these questions.

The key predictor variable was created based on levels of delivery care. The first category, home delivery with a lay attendant, consists of women who delivered with birth attendants without formal medical training. The second category, delivery with primary healthcare services, consists of women who delivered at home with skilled birth attendants (doctors, nurses, midwives, paramedics, family welfare visitors, community skilled birth attendants and/or medical assistants) and women who delivered at NGO clinics, health and family welfare centers or upazila (Bangladeshi administrative unit) health complexes. This is because the government of Bangladesh not only emphasizes delivering

at health facilities but also promotes delivering with a skilled birth attendant at home (MHFW 2011; NIPORT et al. 2012). The final category, delivery with higher-level healthcare services, consists of women who delivered at government hospitals, district hospitals, maternal and child welfare centers, private hospitals or special medical colleges.

Weighted logistic regression analyses (adjusting for sampling weights and clustering) were performed on each of the outcome variables separately except application of antiseptic to the cord. An unweighted logistic regression analysis was performed for application of antiseptic to the cord because of stratum with a single sampling unit. Adjusted odds ratios (aORs) are reported in Table 3. All outcome variables were recoded as binary variables with “1” indicating compliance with recommended practice and “0” indicating noncompliance. Tables 1 and 2 were based on a regression sample with breastfeeding within 1 h as the outcome because it was the largest sample (n=1810) among all regression samples. Covariates for the regression models included all of the demographic and predictor variables aforementioned as well as antenatal visits during pregnancy. For breastfeeding within 1 h, delivery by caesarean section was also included as a covariate. Last, all of the included covariates were assessed for multicollinearity, and high levels of multicollinearity were not detected.

Results

The mean age was highest for women who delivered with higher-level healthcare services (24 years). As for education, the proportion of women with no education was highest among those who had home delivery with a lay attendant (42%). The proportion of women with secondary education or higher, on the other hand, was highest among those who delivered with higher-level healthcare services (32%).

High proportions of women who delivered with primary or higher-level healthcare services had a parity of one or two while women who had home delivery with a lay attendant had comparable proportions across parities. In addition, proportions of richer and richest women among those who delivered with primary or higher-level healthcare services were higher than the proportions among those who had home delivery with a lay attendant. As for residence, the majority of women who had home delivery with a lay attendant lived in rural areas. For women who delivered with primary or higher-level healthcare services, the proportions of urban and rural residence were close to even. Employment was generally low for all women in the study, and the majority of caesarean sections were performed with higher-level healthcare services as expected.

Table 3 Weighted logistic regression of essential newborn care practices

	Nonapplication of substances to cord		Application of antiseptic to cord ^a		Drying newborn within 5 min		Wrapping newborn within 5 min		Delayed first bath until after the first 72 h		Breastfeeding within 1 h	
	aOR (95% CI)	p-val	aOR (95% CI)	p-val	aOR (95% CI)	p-val	aOR (95% CI)	p-val	aOR (95% CI)	p-val	aOR (95% CI)	p-val
Level of delivery care^b												
Home delivery with lay attendant (ref)	-	-	-	-	-	-	-	-	-	-	-	-
Delivery with primary healthcare	0.57 (0.37–0.88)	0.012	2.68 (1.49–4.79)	0.001	1.78 (1.16–2.73)	0.009	1.79 (1.17–2.73)	0.007	1.19 (0.74–1.93)	0.470	1.02 (0.71–1.48)	0.900
Delivery with higher-level healthcare	0.47 (0.30–0.74)	0.001	4.60 (2.70–7.82)	0.000	2.98 (1.86–4.77)	0.000	1.64 (1.07–2.50)	0.023	2.80 (1.83–4.28)	0.000	1.34 (0.94–1.91)	0.110

^aThe logistic regression for application of antiseptic to cord was not weighted

^bAll odds ratios (except those for breastfeeding within 1 h) are adjusted for number of antenatal visits, women's age, women's education, parity, women's employment, wealth and residence. Odds ratios for breastfeeding within 1 h were also adjusted for caesarean sections

Compared to home deliveries with lay attendants, deliveries with primary or higher-level healthcare services had higher use of most recommended ENC practices. The only exceptions were application of substances to the cord and breastfeeding within 1 h. Higher-level healthcare services had the lowest proportion of nonapplication of substances to the cord and the lowest proportion of breastfeeding within 1 h. The proportions for all recommended ENC practices were generally low across all three categories. Only 3% of the sample reported that all immediate ENC practices were performed.

The odds that women who delivered with primary and higher-level healthcare services would report that no substance was applied to the cord were half the odds reported for women who had home delivery with a lay attendant (aORs of 0.57 and 0.47, respectively)—the referent category for all aORs reported hereafter. For application of antiseptic to the cord, women who delivered with primary healthcare services had over two and a half times the odds (aOR=2.68) of having antiseptic applied to the cord. Women who delivered with higher-level healthcare services reported even larger odds (aOR=4.60) of doing so.

This pattern was also evident for drying and wrapping the newborn within 5 min. Women who delivered with primary healthcare services had nearly twice the odds for both outcomes, aORs of 1.78 and 1.79, respectively. Women who delivered with higher-level healthcare services reported nearly three times the odds for drying the newborn within 5 min (aOR=2.98) and over one and a half times the odds for wrapping the newborn within 5 min (aOR=1.64).

The odds of delaying the newborn's first bath were nearly three times greater for women who delivered with higher-level healthcare services (aOR=2.80). The odds of breastfeeding within 1 h were also greater for women who delivered with higher-level healthcare services but were not statistically significant (aOR=1.34, $p=0.110$). For women who delivered with primary healthcare services, the aORs for delaying first bath and breastfeeding within 1 h were not statistically significant with large p -values (aOR=1.19, $p=0.470$; aOR=1.02, $p=0.900$).

Discussion

In recent years, the gap in ENC practices in health facilities has been highlighted by a few studies (Crowe et al. 2015; Hoque et al. 2012; Pagel et al. 2014; Rubayet et al. 2012). Because increasing facility delivery coverage is an essential means of reducing maternal and newborn mortality in Bangladesh (MHFW 2011; NIPORT et al. 2012), it is important that providers at health facilities have the

capacity to provide high-quality ENC. As expected, women who delivered with primary and higher-level healthcare services had greater odds of reporting compliance with most recommended ENC practices than women who had home delivery with a lay attendant. The most interesting findings were the exceptions in which there were no statistically significant differences in ENC practices between home delivery with a lay attendant and delivery with primary or higher-level healthcare services.

Ideally, newborns delivered by primary and higher-level healthcare services would have significantly higher odds of receiving delayed first bath and breastfeeding within 1 h than their counterparts who were delivered by a lay attendant at home. There could be many possible explanations for why this was not the case in our study. One explanation concerning delayed first bath is that some healthcare providers may be unaware of the potential harm early bathing can pose to newborns.

As for breastfeeding within 1 h, a plausible explanation for the insignificant aORs could be that a large volume of patients come to higher-level health facilities for serious pregnancy complications (MHFW 2011). These conditions may not enable women to initiate breastfeeding soon after delivery. However, the logistic regression model adjusted for caesarean sections to control for the effect of complicated births on low breastfeeding. Hence, the statistical insignificance of the aORs may be a true representation of how breastfeeding levels following home delivery with a lay attendant compare with those following delivery with primary and higher-level healthcare services.

These findings have significant public health implications, as primary healthcare services are meant to be the first point of contact with the healthcare system for hard-to-reach populations (MHFW 2011). Since the Bangladesh Ministry of Health and Family Welfare (2009) promotes the use of recommended ENC practices among all of their healthcare staff, a reassessment of primary healthcare providers' knowledge, beliefs and attitudes could be a key strategy moving forward. In addition, ensuring that the facilities have an adequate procurement of necessary supplies and equipment for performing ENC is crucial. Without basic supplies such as clean and dry towels, cord clamps and blades or scissors, performing some ENC practices would not be possible even with correct provider knowledge, beliefs and attitudes.

Another interesting finding was the pattern regarding application of substances to the cord. Women who delivered with primary and higher-level healthcare services had lower odds of not applying any substances to the cord than women who had home delivery with a lay attendant. This may be partially explained by the fact that women who delivered with primary and higher-level health services had much higher odds of applying antiseptic to the cord than

women who had home delivery with a lay attendant. As of 2013, the WHO recommends not applying any substances to the cord for facility deliveries (WHO 2013). However, using 4% chlorhexidine can still be useful and is sometimes encouraged in resource-limited facilities where unhygienic deliveries may be common (Karumbi et al. 2013). This study cannot determine with the 2011 BDHS data whether 4% chlorhexidine, as opposed to other types of antiseptic, is primarily being used in higher-level health facilities.

Finally, many recommended ENC practices had low levels of use. In fact, the use of all recommended ENC practices was low for both delivery with primary healthcare services and higher-level healthcare services. The low use of all recommended ENC practices indicates that although past interventions have had some success in improving ENC practices in their respective program areas (Azad et al. 2010; Baqui et al. 2008; Darmstadt et al. 2010; Fot-trell et al. 2013; Rahman et al. 2015, 2011a; Sloan et al. 2008; Syed et al. 2006), more work needs to be done to increase coverage overall.

Improved overall use of ENC practices will help to reduce the burden of neonatal mortality in Bangladesh. In the period between 1990 and 2013, neonatal mortality declined from 55 deaths per 1000 live births to 24 deaths per 1000 live births (You et al. 2014). Despite such a substantial decline, it actually represents an increase in the share of neonatal mortality among under-5 mortality (You et al. 2014). Advocating for universal coverage of ENC practices in primary and higher-level healthcare facilities can expedite the rate of decline for neonatal mortality.

There are a few limitations to the study. The only ENC question asked to women with a caesarean section was on breastfeeding within 1 h. Interpretation of findings for other ENC outcomes therefore should be limited to women who had vaginal births. This study also did not include maternal and neonatal complications as covariates in the analysis model because data were not available.

Noninclusion of maternal and neonatal complications as covariates may be important for several reasons. Women who experienced severe complications during delivery may not accurately recall the events that occurred during delivery. In addition, newborns with severe complications might be separated from their mothers immediately following delivery for further care and treatment, which can limit ENC practices that require interaction between the mothers and newborns. Addressing severe complications may also interfere with the healthcare providers' ability to follow routine ENC recommendations. For these reasons, authors speculate that ENC use for newborns delivered with no or mild complications might be higher than for newborns delivered with severe complications. Selecting out women with caesarean delivery for most of the outcomes means that the aORs may actually have been inflated.

Even for normal deliveries, recall bias may still exist due to the demanding nature of a birthing event. For example, Stanton et al. (2013) compared women's recall of events that occurred during birth and the immediate postpartum period to direct observation data and found that ENC indicators such as immediate newborn wrapping, breastfeeding within 1 h and newborn bathing within 1 h did not meet the necessary validity criteria for adequate accuracy. Blanc et al. (2016), using similar methods, also found that skin-to-skin placement of the newborn, breastfeeding within 1 h and immediate drying did not meet the necessary validity criteria. Both studies further suggest that the findings of this study should be interpreted carefully.

Despite its limitations, this study offers important insights for decision makers in Bangladesh. It challenges the notion that use of ENC practices is generally high for newborns delivered in health facilities. It also highlights specific ENC practices that need more emphasis in primary and higher-level healthcare facilities. As the coverage of facility delivery continues to increase, ensuring a high level of ENC use in health facilities will be the key to maintaining the momentum of decreasing neonatal mortality.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflicts of interest.

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