

# Factors Associated with Post-Natal Care Utilization among the Women of Reproductive age Group: Evidence from Bangladesh Demographic and Health Survey 2017–18

Israt Tahira Sheba<sup>1</sup> , Abdur Razzaque Sarker<sup>2</sup> , and Afrida Tasnim<sup>1</sup>

## Abstract

**Introduction:** Postnatal period is a crucial stage of illness for mothers and their newborn children. Lack of post-natal care (PNC) services during this period is lifethreatening for both the mother and the babies. This study aims at examining the associated factors of PNC utilization among the mothers to explore the opportunities to accelerate it.

**Methods:** This study utilized the latest data from Bangladesh Demographic and Health Survey (BDHS) 2017–18, a nationally representative survey. A weighted sample of 5043 Bangladeshi women who gave birth three years prior to the survey was studied. Bivariate and multivariate analyses were performed to identify the underlying factors associated with the utilization of PNC.

**Results:** Around 63% women sought PNC from any kind of provider within 24 h to 42 days of the delivery among whom more than 48% received it from medically trained providers. Together with several sociodemographic factors- administrative division, place of residence, educational level, employment status, wealth status, some maternal factors such as- antenatal care (ANC) visits, place and mode of delivery- played a significant role in utilizing PNC services from trained providers.

**Conclusion:** To further improve utilization of post-natal care, national and local level action plans should be introduced to promote health facility delivery irrespective of their place of residence. In the meantime, PNC awareness campaigns, intervention and economic empowerment programs targeting mothers from the poorest quintile needs to be implemented, particularly those who are unable to attend at least four ANC visits, and have accessibility issues to education.

## Keywords

reproductive age women, maternal health, PNC, Bangladesh, BDHS

## Introduction

Despite having noteworthy accomplishments in reducing maternal death in the last two decades, globally about 295,000 women die from complications related to pregnancy, of which most of them occurred in developing countries including Bangladesh.<sup>1</sup> Most of the causes of maternal mortality are due to excessive bleeding, which often occurs after childbirth, postpartum infections, prolonged labor, and unsafe abortion.<sup>2</sup> Postnatal care (PNC) for the new mother and her child is crucial to treat any future complications emerging from the child delivery and to provide the mother with important health information.<sup>3</sup> Bangladesh, located in South Asia and being a part of the Least Developing Countries (LDCs), witnessed around 5100 maternal death due to pregnancy and related complications in the recent year<sup>1</sup>; more than 50% of

which could have been prevented by ensuring proper care in the post-partum period starting about an hour after the delivery of the placenta and includes the following six weeks.<sup>4,5</sup>

According to the recommendation of the World Health Organization (WHO), all mothers and newborns should receive postnatal care (PNC) within the first 24 h of birth and they should also receive at least three additional postnatal

<sup>1</sup> Institute of Health Economics, University of Dhaka, Dhaka, Bangladesh

<sup>2</sup> Health Economics and Financing Research, Population Studies Division, Bangladesh Institute of Development Studies (BIDS), Dhaka, Bangladesh

### Corresponding Author:

Israt Tahira Sheba, Institute of Health Economics, University of Dhaka, 4th Floor, Arts Building, Dhaka-1205, Bangladesh.

Email: [israttahira.ihe@du.ac.bd](mailto:israttahira.ihe@du.ac.bd)



check-ups within 42 days of the birth.<sup>5,6</sup> Circumventing routine postnatal check-ups can pose a major challenge to safe motherhood resulting in post-partum hemorrhage, eclampsia, puerperal genital infection, thromboembolic disease, difficulties in breastfeeding, and psychological problems (baby blues).<sup>4</sup> Globally around 30% of maternal deaths occur during the post-partum period<sup>7</sup>; while in Bangladesh mothers are enduring more than 68% of deaths in the post-partum period mostly (31%) caused by post-partum hemorrhage<sup>8</sup> which has shed light on the perilous consequences of inadequate utilization of PNC. Such figures can create a major hindrance in reaching the maternal mortality target of fewer than 70 deaths per 100,000 live births by 2030 (which is a major indicator of the third UN Sustainable Development Goal (SDG)<sup>9</sup>), while also delaying the country's progress towards achieving Universal Health Coverage by 2030.<sup>10</sup>

Comprehending the importance of adequate utilization of PNC, the Government of Bangladesh is aspiring to achieve 80% postnatal care coverage within 48h of the delivery from a medically trained provider by 2025 and 100% by 2030.<sup>11</sup> Therefore, it is imperative to focus on the factors associated with the utilization of PNC among the women of Bangladesh to inform the policymakers to be concerned of. An ample of studies highlighted the association between PNC utilization and various factors such as socioeconomic factors (educational level, employment status, and economic status of individuals),<sup>3,12–24</sup> demographic characteristics (administrative division, place of residence, and mother's age at birth),<sup>3,12,13,19–22,25,26</sup> and birth-related factors (antenatal care visits and, place and mode of delivery).<sup>3,13,16,18,19,21,22,24,27–35</sup> Although, a body of literature in Bangladesh have focused on post-natal care services of mothers from the perspectives of different region,<sup>36–38</sup> income level<sup>39</sup> or age,<sup>12</sup> a dearth of studies using recent nationally representative data in this topic is still dominant. Furthermore most of the studies focused on early utilization of PNC<sup>13</sup>; whereas the condition of the mother can worsen at any time during the post-partum period which makes the entire period of PNC highly crucial for maintaining maternal well-being.<sup>4</sup> To make a proper understanding of the various demand-side factors associated with PNC, this study utilized recent nationally representative data. The findings from the study will contribute developing up-to-date evidence for the policymakers and other stakeholders to design more effective interventions needed to accelerate the utilization of PNC and improving maternal health in Bangladesh.

## Materials and Methods

### Study Design and Settings

The study was conducted among Bangladeshi mothers and we used the latest Bangladesh Demographic and Health Survey (BDHS) 2017–18 data, which is a nationally representative cross-sectional household survey designed to obtain demographic and health indicators. The survey was implemented

from October 2017 to March 2018, under the National Institute of Population Research and Training (NIPORT) of the Ministry of Health and Family Welfare covering all 8 administrative divisions of Bangladesh. The survey design adopted a two-stage stratified cluster sampling procedure to select households. The survey selected 675 enumeration areas (EAs) in the first stage and conducted household listing for each EA in both rural and urban areas. Consistently, an average of 30 households were selected systematically from each EA in the second stage. The detailed method, sampling procedure, survey design, instruments, measuring system, data validity, reliability, and quality control are described elsewhere.<sup>40</sup>

### Population and Sample Size

A structured questionnaire was administered by trained and experienced interviewers, and 20,127 ever-married reproductive (15–49 years) women who had childbirth in the last 3 years prior to the survey were interviewed to capture socio-economic, demographic, and health care utilization data at the household level. Data regarding the most recent live birth were collected in the cases of women with a history of giving more than one live birth which made the total number of samples to be 5051. Disregarding the missing values, a weighted sample of 5043 mothers was included in the analysis.

### Outcome Variables

This study focused on three outcome variables: first, outcomes related to post-natal care utilization of mother aged 15 to 49 years for the last birth in the last 3 years (coded into “1” if utilized the care within the first 24 h and 42 days of delivery and “0” in case of the opposite); second, timing for PNC visits/checkups was defined into three categories- as the majority of maternal and newborn deaths occur during the first few hours and days after birth,<sup>5</sup> it was coded as of visited within first 24 h, 2–6 days and 7–42 days and third, the health care seeking behavior for PNC utilization of mother was coded into “Trained Health Care Providers” (qualified doctor, nurse/midwife/paramedic, family welfare visitor, community skilled birth attendant, community health care provider, health assistant, family welfare assistant, trained traditional birth attendant, NGO workers were considered as trained health workers) and “Untrained Health Care Providers” (untrained traditional birth attendant, unqualified doctor and others).

### Explanatory Variables

Different independent variables including socio-demographic and type of delivery assistance were focused on to explain the influencing factors of PNC utilization. Divisional distribution, urban-rural classification, mother's age at birth (coded into 15–19 years, 20–24 years, 25–29 years, 30–34 years, and 35–49 years), and educational status of both respondent and

her husband (categorized as “No education”, “Primary level”, “Secondary level” and “Higher”) were included in this study. In addition to these, the mother’s occupation was categorized as “Homemaker/ no formal occupation”, “Agriculture related employment” (landowner, farmer, agricultural worker, fisherman, poultry raising, cattle raising, home-based manufacturing), and “Professional”. Moreover, the wealth index of the participants was categorized as “poorest,” “poorer,” “middle,” “richer,” and “richest” and access to media was recorded as the frequency of reading newspapers, listening to the radio, and watching TV (categorized as “Yes” if they had access to anyone these media at least once in a week; and “No” otherwise).

Other variables included utilization of antenatal care (ANC) (categorized as “No ANC”, “1 to 3 ANC” and “4 and above”), birth order of child (coded into four-category as the first order, second-third order, fourth-fifth order, sixth and more births), and mode of delivery which was categorized into “Normal Vaginal Delivery (NVD) and “Cesarean Section”. Again, place of delivery was coded into “Respondent’s home”, “Public hospital” (public hospital, district hospital, maternal and child welfare center, Upazila health complex, Upazila health and family welfare center, other public sector and community clinic), “Private hospital/clinic”, and “NGO and Others”. If the respondent confronted at least one challenge to access health care (e.g., not getting permission to go, not getting the money needed for the treatment, distance to a health facility or not wanting to go alone), then the variable perceived difficulty to access health care was coded into “1” (facing at least one problem); otherwise, it was “0” (facing no problem).

### Statistical Analysis

Descriptive analysis such as frequency distribution as well as cross-tabulation was applied for calculating the prevalence of PNC utilization focusing on important variables. A Chi-square test of association was applied to test the statistical significance of bivariate distributions of dependent variables across independent variables. To determine the factor affecting PNC utilization and health care-seeking behavior, two logistic regression analyses have been used- model I presenting the factors affecting the utilization of PNC and model II capturing the variables working behind healthcare-seeking behavior for PNC utilization. The results were presented in terms of adjusted odds ratios (AORs) with a 95% confidence interval (CI) and statistical significance was considered at a  $P$ -value of  $<.05$  in all analyses. The variance inflation factor test was employed to detect the multicollinearity in the regression model. All statistical analysis was done using the statistical package Stata/SE 14 software.

## Results

### Background Characteristics of the Participants

Table 1 illustrates the background characteristics of 5043 respondents in the study. More than half of the women

(63.2%) utilized post-natal care from any sort of health care provider. The result showed that most of the respondents (25.6%) were from Dhaka division and majority (35.2%) belonged to the age group of 20–24 years. The lion part of the women (73.2%) belonged to rural area with majority having no formal occupation (60.8%); whereas, most of the respondents’ husbands (79.8%) had professional employment. Almost half of the respondents (49%) had passed the secondary level while 34% of their husbands had the same educational qualification. Almost an equal portion of participants belonged to each quintile of the wealth index and the majority of them (65.7%) had exposure to some form of media. Almost half of the mothers (47%) attended 4 or more antenatal care visits although 65.7% of them faced some sort of challenges to access health care. Almost 67% of mothers had normal delivery and 50% of the women had their delivery done at home.

### Utilization of Post-Natal Care Across Background Characters

Table 2 picturizes the percentage of women utilizing PNC services from both trained and untrained providers from different backgrounds. Utilization of PNC was higher among the mothers from Mymensingh division (69.7%) followed by the mothers from Chattogram division (69.6%). The rural and the middle-aged (30–34 years) mothers utilized more PNC; while the mothers having secondary and higher education utilized less PNC (56.7%). Women who were engaged in agriculture-related work frequently utilized PNC (70.5%); whereas women from the richer quintile were more vulnerable to using PNC services. Further, women having home delivery and also who did not pay any ANC visit utilized more PNC.

In the case of timing for PNC check-ups, the frequency varied by different factors (see Table 2). Within the first 24 h after the delivery, the majority of the women (31.3%) from the poorest quintile utilized PNC; whereas, the richest participants utilized PNC within 7–42 days after the delivery. Mothers who delivered at home had a higher percentage (99%) of utilizing PNC within the first 24 h than their counterparts who availed institutional facilities; the majority of the participants (73.3%) who had their check-up after 7–42 days, availed the private facilities. Women undergoing cesarean section delivery mostly had their PNC check-ups within 7–42 days (84%), while women utilizing PNC within the earliest period (24 h) experienced NVD. In addition to these, utilizing PNC during different time spans varied by residential and divisional disparities, educational qualification, occupation, birth order of the child and perceived difficulties to access health care.

### Health Care Seeking Behavior of PNC

In Figure 1, the health care-seeking behavior is illustrated. Among the total prevalence (3186), 48.3% (CI = 47.3, 49.3) of respondents visited the medically trained provider to utilize post-natal care within 24 h to 42 days after the delivery. If

**Table 1.** Socio-Demographic and Maternal Characteristics of Women (n = 5043).

Characteristic	Frequency (n)	Percent (%)	Characteristic	Frequency (n)	Percent (%)
PNC utilization			Husband's Occupation		
No	1857	36.8	Not working	36	0.7
Yes	3186	63.2	Agriculture-related employment	966	19.4
Division			Professional employment	3963	79.8
Barisal	288	5.7	Not known	6	0.1
Chattogram	1066	21.2	Wealth Index		
Dhaka	1291	25.6	Poorest	1042	20.6
Khulna	464	9.2	Poorer	1036	20.5
Mymensingh	431	8.5	Middle	967	19.2
Rajshahi	586	11.6	Richer	1015	20.2
Rangpur	534	10.6	Richest	983	19.5
Sylhet	383	7.6	Media Exposure		
Type of residence			Yes	3313	65.7
Urban	1351	26.8	No	1730	34.3
Rural	3692	73.2	Perceived difficulty to access health care		
Mother's age (years)			At least one problem	3312	65.7
15–19	904	17.9	No problem	1731	34.3
20–24	1776	35.2	ANC attendance		
25–29	1306	25.9	No visit	405	8.0
30–34	762	15.1	1 to 3	2269	45.0
35–49	295	5.9	4 and above	2369	47.0
Highest level of education			Place of delivery		
No education	318	6.3	Home	2516	49.9
Primary	1395	27.6	Public facility	721	14.3
Secondary	2471	49.0	Private facility	1595	31.6
Higher	859	17.1	NGO and others	211	4.2
Husbands' highest level of education			Mode of delivery		
No education	680	13.6	NVD	3368	66.8
Primary	1677	33.7	Caesarean section	1675	33.2
Secondary	1694	34.0	Birth order		
Higher	915	18.4	First	1928	38.2
Not known	14	0.3	Second or third	2498	49.5
Mother's Occupation			Fourth or fifth	517	10.3
Homemaker/No formal occupation	3065	60.8	Sixth or more	100	2.0
Agriculture-related employment	1430	28.4			
Professional employment	546	10.8			

the socioeconomic condition is considered, mothers from the poor groups (first 3 quintiles) mostly sought treatment from untrained PNC providers, whereas utilization of care from the trained provider is the highest (30.2%) among the mothers from the richest quintile. The figure also reveals the fact that mothers who sought care from untrained providers mostly (33.4%) belonged to the poorest quintile.

### Factors Associated with PNC Utilization

The factors that are closely related to the prevalence of PNC utilization and the health care seeking behavior are demonstrated in Table 3. From the binary logistic model, we found that divisional and residential variation, educational qualification and occupation of the respondents, economic status and other maternal characteristics (ANC visits, delivery mode, and

place) played a significant role to influence the mothers for utilizing PNC and that also from a trained provider. The result showed that the mothers from Chattogram (aOR = 2.14, 95% CI = 1.73, 2.64), Rangpur (aOR = 1.64, 95% CI = 1.25, 2.16), Sylhet (aOR = 1.54, 95% CI = 1.15, 2.08), and Mymensingh (aOR = 1.45, 95% CI = 1.09, 1.92) were more likely to seek PNC than the mothers from the capital city, Dhaka. In the case of seeking treatment from trained providers, the respondents from the Barisal division had higher odds (aOR = 1.61, 95% CI = 1.08, 2.4); although the mothers from the Rajshahi division were 32% less likely to visit the trained PNC provider (aOR = 0.68, 95% CI = 0.47, 0.97). The respondents from urban area were more prone to utilize PNC (aOR = 1.35, 95% CI = 1.13, 1.62) and also from the trained provider (aOR = 1.69, 95% CI = 1.33, 2.15) than their counterpart from rural area. Women passing the secondary and higher level of

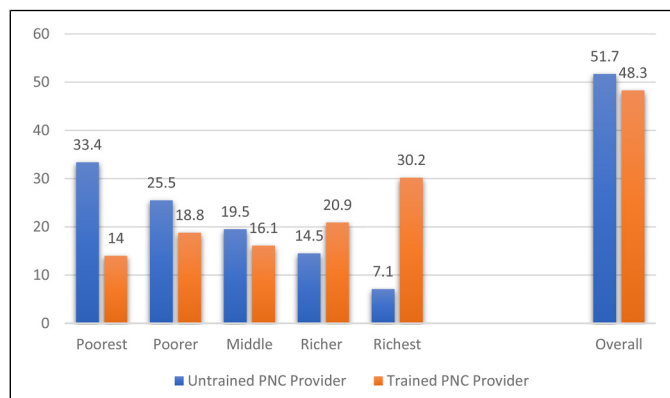
**Table 2.** Percentage Distribution of Women by Utilization of Postnatal Care.

Characteristic	Mothers utilizing PNC		Timing for PNC check-up			p-value
	%	p-value	Within the first 24 h	Within 2–6 days	Within 7–42 days	
	%		%	%	%	
<b>Division</b>						
Barisal	64.2	<.001	6.8	4.6	3.5	<.001
Chattogram	69.6		23.5	24.2	22.9	
Dhaka	56.4		19.9	30.8	28.1	
Khulna	57.7		7.5	6.8	10.7	
Mymensingh	69.7		11.2	4.3	6.1	
Rajshahi	58.1		9.7	9.4	13.7	
Rangpur	68		12.3	10.8	9.4	
Sylhet	67.7		9.1	9.1	5.6	
<b>Type of residence</b>						
Urban	61	.243	19.5	32.4	40.5	<.001
Rural	64		80.5	67.6	59.5	
<b>Mother's age (years)</b>						
15–19	61	.063	17.7	17.4	16.5	.055
20–24	62.4		33.9	32.8	37.3	
25–29	62.9		25.9	34.1	23.2	
30–34	67.5		16.2	13.1	17.1	
35–49	64.8		6.3	2.6	5.9	
<b>Highest level of education</b>						
No education	71.2	<.001	8.7	5.5	3.5	<.001
Primary	69.7		37.6	19.3	15.4	
Secondary	60.7		46.1	48.2	49.2	
Higher	56.7		7.6	27	31.9	
<b>Husbands' highest level of education</b>						
No education	72	<.001	19.2	9.9	7.7	<.001
Primary	66.5		41.6	30	21.4	
Secondary	60		30.8	31.4	36.6	
Higher	55.5		8.1	28.3	33.9	
Not known	68.4		0.3	0.4	0.4	
<b>Mother's Occupation</b>						
Homemaker/No formal occupation	59.5	<.001	51.7	71.1	68.4	<.001
Agriculture-related employment	70.5		37.6	20	19.1	
Professional employment	64.7		10.7	8.9	12.5	
<b>Husband's Occupation</b>						
Not working	37.7	<.001	0.4	0.4	0.6	<.001
Agriculture-related employment	68.3		25.6	10.4	11.4	
Professional employment	62		73.9	89.2	88	
Not known	54.7		0.1	0	0	
<b>Wealth Index</b>						
Poorest	73.6	<.001	31.3	10.6	9.1	<.001
Poorer	68.6		25.3	23	14.9	
Middle	58.8		19.3	13.5	15.3	
Richer	55.1		15.5	27.4	20.7	
Richest	59.1		8.6	25.5	40	
<b>Media Exposure</b>						
Yes	59.2	<.001	53.2	69.9	80	<.001
No	70.9		46.8	30.1	20	
<b>ANC attendance</b>						
No visit	72.4	<.001	12.7	1.6	2	<.001
1 to 3	63.1		52.3	39	28	
4 and above	61.7		34	59.4	70	

(continued)

**Table 2.** (continued)

Characteristic	Mothers utilizing PNC		Timing for PNC check-up			p-value
	%	p-value	Within the first 24 h	Within 2–6 days	Within 7–42 days	
Place of delivery						
Home	85.3	<.001	97	27.4	2	<.001
Public facility	28.1		0.7	18	17.9	
Private facility	46.4		1.3	43.7	73.3	
NGO and others	46.5		1	10.9	6.8	
Mode of delivery						
NVD	70	<.001	99	54.4	16	<.001
Caesarean section	49.4		1	45.6	84	
Birth order						
First	59.2	<.001	30.4	42.6	48.3	<.001
Second or third	64.2		52	47.5	46.3	
Fourth or fifth	69.9		14.2	9.5	4.6	
Sixth or more	79.8		3.4	0.4	0.8	
Perceived difficulty to access health care						
At least one problem	64.6	<.001	72.4	57.4	55.8	<.001
No problem	60.4		27.6	42.6	44.2	

**Figure 1.** Proportion of PNC utilization among women across wealth quintile.

education had higher likelihood of receiving treatment from trained PNC providers than women with lower or no educational qualification (aOR = 1.76, 95% CI = 1.17, 2.66, and aOR = 2.46, 95% CI = 1.48, 4.11). The study also found that mothers engaged in agricultural-related employment were 1.37 times more likely to receive PNC and had 1.27 times higher odds to receive that treatment from trained providers than the mothers with no formal occupation. If the economic status is considered, mothers from the richest quintile were 86% more likely to seek PNC from trained providers than the mothers from the poorest quintile; while the odds of the richer mothers for the same purpose was 1.39 (95% CI = 1.01, 1.92).

During the pregnancy period, the mothers who paid optimal number of antenatal care visits (4 and above) were 2.48 times more likely to utilize post-natal care than the mothers who

had no visit at all. In the case of receiving treatment from trained providers, they (paying ANC visits 4 and above) were 67% more likely than their counterparts to pay no visit. In the case of utilizing PNC from any sort of provider, the women who had home delivery had the highest odds of doing it than those having institutional delivery (aOR = 29.53, 95% CI = 23.21, 37.57). However, the result turned in an opposite direction when the trained providers were considered. Women having delivery at home were the least inclined to avail PNC services from the trained health care providers than the mothers having institutional deliveries (aOR = 0.15, 95% CI = 0.09, 0.24).

## Discussion

Utilizing post-natal care from a medically trained provider can prevent severe complications during the post-partum period by detecting and providing proper treatment to the mothers resulting in reduction of maternal morbidity. Nevertheless, the prevalence of PNC is still quite low in Bangladesh. This study made an effort to identify the underlying factors causing the low prevalence of PNC among mothers in Bangladesh using the latest nationally representative data.

During our analysis of BDHS 2017–18 data, we discovered that nearly half of the women utilized PNC from medically trained providers within 42 days of the delivery which is almost similar to the findings of the national survey within 2 days of the delivery (52%).<sup>40</sup> This figure is higher to some extent than the prevalence reported in BDHS 2014 (34%).<sup>41</sup> Though the prevalence has risen over the years, this figure is not so impressive compared to other neighboring countries such as India (65%),<sup>18</sup> Myanmar (68%),<sup>42</sup> Nepal (59%),<sup>43</sup> Indonesia (78.5%)<sup>34</sup> and African countries such as Benin

**Table 3.** Factors Associated with post-Natal Care Utilization among Mothers who Gave Birth in the 3 Years Preceding the Survey (BDHS 2017-18) in Bangladesh.

Variables	Binary logistic regression	
	Model I Any care	Model II Trained health care provider
	Adjusted OR (95% CI)	Adjusted OR (95% CI)
<b>Division</b>		
Dhaka (ref)	1	1
Barisal	1.14 (0.82, 1.58)	1.61** (1.08, 2.4)
Chattogram	2.14*** (1.73, 2.64)	0.99 (0.76, 1.31)
Khulna	1.28* (0.98, 1.67)	0.98 (0.68, 1.43)
Mymensingh	1.45** (1.09, 1.92)	0.92 (0.64, 1.31)
Rajshahi	1.08 (0.85, 1.38)	0.68** (0.47, 0.97)
Rangpur	1.64*** (1.25, 2.16)	1.06 (0.75, 1.50)
Sylhet	1.54*** (1.15, 2.08)	1.04 (0.72, 1.51)
<b>Type of residence</b>		
Rural (ref)	1	1
Urban	1.35*** (1.13, 1.62)	1.69*** (1.33, 2.15)
<b>Mother's age (years)</b>		
15–19 (ref)	1	1
20–24	1.10 (0.89, 1.35)	0.87 (0.66, 1.16)
25–29	1.00 (0.78, 1.29)	1.10 (0.78, 1.55)
30–34	1.28 (0.95, 1.73)	1.11 (0.74, 1.66)
35–49	1.01 (0.68, 1.51)	1.47 (0.87, 2.48)
<b>Highest level of education</b>		
No education (ref)	1	1
Primary	1.13 (0.81, 1.58)	1.29 (0.87, 1.92)
Secondary	1.07 (0.76, 1.50)	1.76*** (1.17, 2.66)
Higher	1.28 (0.86, 1.90)	2.46*** (1.48, 4.11)
<b>Husbands' highest level of education</b>		
No education (ref)	1	1
Primary	0.87 (0.68, 1.11)	1.05 (0.80, 1.38)
Secondary	0.86 (0.66, 1.11)	0.94 (0.69, 1.27)
Higher	0.82 (0.60, 1.11)	1.03 (0.69, 1.54)
<b>Mother's Occupation</b>		
Homemaker/No formal occupation (ref)	1	1
Agriculture-related employment	1.37*** (1.15, 1.64)	1.27** (1.02, 1.57)
Professional employment	1.14 (0.91, 1.43)	1.09 (0.81, 1.48)
<b>Husband's Occupation</b>		
Not working (ref)	1	1
Agriculture-related employment	1.73 (0.78, 3.85)	0.31 (0.07, 1.44)
Professional employment	1.84 (0.84, 4.01)	0.40 (0.09, 1.83)
<b>Wealth Index</b>		
Poorest (ref)	1	1
Poorer	1.05 (0.83, 1.337)	1.33** (1.02, 1.73)
Middle	.76** (0.60, 0.98)	1.12 (0.83, 1.50)
Richer	.78* (0.60, 1.02)	1.39** (1.01, 1.92)
Richest	1.16 (0.85, 1.58)	1.86*** (1.25, 2.78)
<b>Media Exposure</b>		
No (ref)	1	1
Yes	0.84** (0.70, 1.00)	1.13 (0.92, 1.40)
<b>ANC attendance</b>		
No visit (ref)	1	1
1 to 3	1.52*** (1.14, 2.02)	1.38* (0.99, 1.94)
4 and above	2.48*** (1.83, 3.36)	1.67*** (1.17, 2.39)

(continued)

Table 3. (continued)

	Binary logistic regression	
	Model I Any care	Model II Trained health care provider
Place of delivery		
Public facility (ref)	1	1
Private facility	1.39*** (1.12, 1.74)	1.15 (0.67, 1.20)
NGO and others	2.13*** (1.52, 2.98)	0.64 (0.33, 1.27)
Home	29.53*** (23.21, 37.57)	0.15*** (0.09, 0.24)
Mode of delivery		
NVD (ref)	1	1
Caesarean section	2.90*** (2.33, 3.61)	2.72*** (1.64, 4.50)
Birth order		
Sixth or more (ref)	1	1
Fourth or fifth	0.86 (0.47, 1.58)	0.88 (0.48, 1.62)
Second or third	0.88 (0.48, 1.61)	1.01 (0.55, 1.84)
First	1.01 (0.53, 1.90)	1.26 (0.65, 2.43)
Perceived difficulty to access health care		
No problem (ref)	1	1
At least one problem	0.99 (0.85, 1.15)	0.97 (0.80, 1.18)

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$ .

(68%)<sup>44</sup> and Zambia (63%).<sup>35</sup> While some other African countries such as Nigeria,<sup>19</sup> Ethiopia,<sup>3</sup> Rwanda,<sup>45</sup> and Kenya<sup>46</sup> have a lower prevalence of PNC than Bangladesh. Such distinctions can be a reflection of the variation in country-specific factors and, also the strength of the health care system providing maternal and child care.

The results of the multivariate analysis of the study indicated the following factors as correlates of PNC utilization in Bangladesh: variation in administrative divisions and place of residence, women's educational level and employment status, wealth status, ANC attendance, place of delivery, mode of delivery and exposure to media. From our analysis, it was observed that compared to the capital city Dhaka, all other divisions performed better regarding utilizing PNC from any provider- trained or untrained; while the scenario was different when only trained provider was considered. This wide range of variation in utilization of PNC across the administrative divisions is evident in several studies conducted earlier.<sup>13,20,25</sup> Existing disparity in availability of and accessibility to health facilities and also the quality of health services in the divisions can be the possible reasons for working behind this.

The study also revealed that the mothers from the urban area had higher odds of utilizing PNC within 42 days of the delivery-irrespective of the type of providers. This finding is consistent with an ample of studies- conducted both in the national and international context.<sup>3,12,19-22,26,38</sup> In rural areas, distance to the nearest health facilities might be a major hindrance in accessing health care services which have been validated by many studies.<sup>12</sup> Moreover, lack of improved electricity, transportation, water and sanitation services, and

access to health promotion programmes often prevent mothers in rural areas from utilizing adequate PNC services.

Our participants completing the secondary and higher level of education were more prone to receive PNC from provider who are medically trained. This finding is in agreement with the evidence from several South Asian and African Countries.<sup>14,15,19-24,27,28</sup> This kind of association can be explained by the fact that educated women are expected to realize the risk of not utilizing PNC resulting in improved health-seeking behavior. Additionally, knowledge and information on the availability of health care services influence educated women to attain and preserve better health. Completing the secondary or higher level of education may empower women with higher socioeconomic status and enable them to take decisions independently regarding any health care service utilization.

This study also demonstrated that women engaged in agricultural-related employment were more likely to utilize PNC than their counterparts who were not employed in any sector. Another study conducted in Uganda using Demographic and Health survey data from 2016 also supports this finding.<sup>24</sup> In Bangladesh, 65% farm labor force is constituted by women and more than 70% of female workers are engaged in the agricultural sector.<sup>47,48</sup> This huge participation of women in such activities empower them with a more secure position in society by improving their socioeconomic status which resulted in their independence in decision-making while taking any care from the trained provider.<sup>49</sup> Indeed, the power of decision making often comes from achieving education influencing women to utilize PNC services which is also associated with women's autonomy and control over resources.



Several studies from different countries revealed that mothers from rich households are more inclined to avail PNC services from trained providers which is also an indication of comparatively lower utilization among mothers from poor households.<sup>3,12,13,16,18–23,50</sup> Our study also echoes similar findings in the case of PNC utilization among Bangladeshi mothers. This might be due to their dependency on the out-of-pocket cost for availing healthcare which is excessively high in Bangladesh. Indeed, it was observed that women from the wealthier index belong to households who can afford the medical and non medical cost of PNC. Allocating only 5.4% of the total budget for the health sector which is less than 1% of gross domestic product (GDP) share, compels the people of Bangladesh to bear around 74% of health care costs from their pocket.<sup>51,52</sup> This huge burden of health care costs also justifies the hypothesis that poor families are unable to afford the additional cost resulting from using services from qualified healthcare providers.

This study highlighted that the mothers who had exposure to any kind of media such as radio, television, or newspaper were less inclined to avail PNC from any kind of providers irrespective of their qualification compared to their counterparts who were not exposed. This result differs from the study conducted in Uganda,<sup>24</sup> Ethiopia,<sup>16</sup> Nigeria,<sup>17</sup> and Malawi<sup>53</sup> where only qualified providers were considered. This counterintuitive incidence can be explained by the fact that highly educated women who are already aware of the seeking behavior are more likely to be exposed to media.<sup>54</sup>

If the enabling factors are considered, the mothers who had optimum ANC visits (four or more) had higher odds of receiving a PNC checkup than their counterparts who had fewer visits, which is validated by the previous findings of India,<sup>18</sup> Pakistan,<sup>21</sup> Nepal,<sup>22</sup> Ethiopia,<sup>3,16,27,29</sup> Nigeria,<sup>19</sup> and Uganda.<sup>24</sup> A possible explanation of this finding is that exposure of pregnant women to counseling and knowledge during ANC visits about the health risk of the post-partum period encourage them to utilize adequate PNC services which keep them at a beneficial position irrespective of their socioeconomic status.

When only the medically trained providers of PNC were considered, the findings of the study revealed that women having delivery at home were less likely to utilize PNC compared to the mothers who had institutional delivery, which was completely different from the result of other studies where the type of providers were not being accounted for. This interesting finding resonates with the results of several previous studies to some extent.<sup>3,13,19,22,24,27–32,34,35</sup> In Bangladesh almost 50% of the delivery is done at home in the presence of a traditional birth attendant and nearest relatives which poses a great challenge for the mother to utilize PNC from trained providers.<sup>40</sup> Alternatively, institutional delivery provides more opportunities for the mothers to pursue knowledge about the importance, accessibility, and availability of PNC utilization as they had to stay in the facility for a significant duration of time.<sup>55</sup> Moreover, this finding also made it obvious that women who had cesarean section delivery at

different facilities had higher odds of receiving PNC from trained providers within 42 days of the delivery. Studies conducted in India,<sup>18</sup> Ethiopia<sup>32</sup> and Tanzania<sup>33</sup> also validate these findings. The mothers having cesarean section delivery are more prone to face complications that can be mitigated by required follow-up services resulting in improved health care-seeking behavior.<sup>56,57</sup>

There are several limitations of this study. The study was based on cross-sectional data, which failed to establish a causal relationship. All information related to the PNC services was provided by mothers which makes it subjective. Further, the self-report system of the participants makes this study suffer from recall bias. The BDHS dataset lacks the queries about the numbering and the contents of PNC recommended by WHO which can be pointed as another limitation. However, the current study has used high quality, nationally representative household survey data from both the urban and rural areas, which is the strength of this study.

## Conclusion

This study observed more than half of the women sought PNC from various health care providers within 24 h to 42 days of the child's delivery while about 48% of mothers received PNC services from medically trained providers. The findings of the study accentuate the importance of reinforcing the health system and improving the maternal care services focusing especially on women who are from rural areas, have lower than secondary level of education, receive no ANC visit, deprived of institutional delivery, and from the lowest wealth quintile having no employment status. Apart from paying special attention to educate the women, national and local level action plans should be materialized to strengthen the health facilities to provide quality maternal care involving ANC, delivery care, and PNC services. To attain the targets and objectives of Bangladesh National Strategy for Maternal Health 2019–2030 in reality, PNC services should be made accessible to all women in need irrespective of their socio-economic status; thus, opening the door towards achieving UHC within 2030 by reducing maternal morbidity and improving overall maternal health and well-being in Bangladesh.

## Author's Note

The study analyzed a publicly available DHS data set by taking consent from the MEASURE DHS program office. DHS followed standardized data collection procedures. According to the DHS, written informed consent was obtained from women enrolled in the survey.

## Acknowledgments

We are grateful to Measure DHS for allowing us access to the 2017–18 DHS dataset for Bangladesh.

## Authors' Contributions

All the authors conceptualized and designed the study. All of them were involved in data analysis, interpretation, and writing of the

manuscript. Finally, all of them critically read and reviewed the manuscript before giving final approval for publication.

### Availability of Data and Materials

The dataset (BDHS 2017-18) used in this study is publicly available at the DHS website: ([https://dhsprogram.com/data/dataset/Bangladesh\\_Standard-DHS\\_2017.cfm?flag=0](https://dhsprogram.com/data/dataset/Bangladesh_Standard-DHS_2017.cfm?flag=0))

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article

### ORCID iDs

Israt Tahira Sheba  <https://orcid.org/0000-0003-4682-2088>

Abdur Razzaque Sarker  <https://orcid.org/0000-0002-2022-7590>

### References

1. WHO, UNICEF, UNFPA, WBG, UN. World Health Organization. (2019). Trends in Maternal Mortality 2000 to 2017: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. World Health Organization. Available from: <https://Apps.Who.Int/Iris/Handle/10665>. 2017.
2. Say L, Chou D, Gemmill A, et al. Global causes of maternal death: A WHO systematic analysis. *Lancet Glob Heal*. 2014;2(6):323-333. doi:10.1016/S2214-109X(14)70227-X
3. Chaka EE, Abdurahman AA, Nedjat S, Majdzadeh R. Utilization and determinants of postnatal care services in Ethiopia: A systematic review and meta-analysis. *Ethiop J Health Sci*. 2019;29(1):935-944. doi:10.4314/ejhs.v29i1.16
4. World Health Organization. Safe motherhood -postpartum care of the mother and newborn: A practical guide. Vol. 53. 1998.
5. World Health Organization (WHO). Postnatal care of the mother and newborn 2013. World Heal Organ. Published online 2013:1-72. [http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649_eng.pdf)
6. World Health Organization, Special Programme of Research D. WHO recommendations on maternal and newborn care for a positive postnatal experience. 2022.
7. Kassebaum NJ, Bertozzi-Villa A, Coggeshall MS, et al. Global, regional, and national levels and causes of maternal mortality during 1990-2013: A systematic analysis for the global burden of disease study 2013. *Lancet*. 2014;384(9947):980-1004. doi:10.1016/S0140-6736(14)60696-6
8. Ahmed S, Ahsan KZ, Curtis S, et al. Bangladesh maternal mortality and health care survey 2016 final report. 2019. <https://www.cpc.unc.edu/measure/publications/tr-12-87>
9. The United Nations. The sustainable development goals report. 2019. <https://unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf>
10. World Health Organisation. Global monitoring report on universal health coverage. World Bank. Published online 2021.
11. Directorate General of Health Services (DGHS), Directorate General of Family Planning (DGFP). Bangladesh national strategy for maternal health 2019-2030. Published online 2019. [http://dgnm.portal.gov.bd/sites/default/files/files/dgnm.portal.gov.bd/page/18c15f9c\\_9267\\_44a7\\_ad2b\\_65affc9d43b3/2021-06-24-11-27-702ae9eea176d87572b7dbbf566e9262.pdf](http://dgnm.portal.gov.bd/sites/default/files/files/dgnm.portal.gov.bd/page/18c15f9c_9267_44a7_ad2b_65affc9d43b3/2021-06-24-11-27-702ae9eea176d87572b7dbbf566e9262.pdf)
12. Mosiur Rahman M, Haque SE, Sarwar Zahan M. Factors affecting the utilisation of postpartum care among young mothers in Bangladesh. *Heal Soc Care Community*. 2011;19(2):138-147. doi:10.1111/j.1365-2524.2010.00953.x
13. Aziz S, Basit A, Sultana S, Homer CSE, Vogel JP. Inequalities in women's utilization of postnatal care services in Bangladesh from 2004 to 2017. *Sci Rep*. 2022;12(1):1-11. doi:10.1038/s41598-022-06672-z
14. Akibu M, Tsegaye W, Megersa T, Nurgi S. Prevalence and determinants of complete postnatal care service utilization in Northern Shoa, Ethiopia. *J Pregnancy*. 2018;2018:1-7. doi:10.1155/2018/8625437
15. Singh PK, Rai RK, Alagarajan M, Singh L. Determinants of maternity care services utilization among married adolescents in rural India. *PLoS One*. 2012;7(2):1-14. doi:10.1371/journal.pone.0031666
16. Ayele BG, Woldu MA, Gebrehiwot HW, et al. Magnitude and determinants for place of postnatal care utilization among mothers who delivered at home in Ethiopia: A multinomial analysis from the 2016 Ethiopian demographic health survey. *Reprod Health*. 2019;16(1):1-10. doi:10.1186/s12978-019-0818-2
17. Agho KE, Ezeh OK, Issaka AI, Enoma AI, Baines S, Renzaho AMN. Population attributable risk estimates for factors associated with non-use of postnatal care services among women in Nigeria. *BMJ Open*. 2016;6(7):1-8. doi:10.1136/bmjopen-2015-010493
18. Krishnamoorthy Y, Majella MG. Determinants of postnatal care coverage among mothers and new-borns in India: Evidence from a nationally representative survey. *Int J Health Plann Manage*. 2021;36(4):1276-1286. doi:10.1002/hpm.3179
19. Somefun OD, Ibisomi L. Determinants of postnatal care non-utilization among women in Nigeria. *BMC Res Notes*. 2016;9(1):1-11. doi:10.1186/s13104-015-1823-3
20. Mazharul I, Masud MS. Health care seeking behaviour during pregnancy, delivery and the postnatal period in Bangladesh: Assessing the compliance with WHO recommendations. *Midwifery*. 2018;63:8-16. doi:10.1016/j.midw.2018.04.021
21. Yunus A, Iqbal S, Munawar R, et al. Determinants of postnatal care services utilization in Pakistan- insights from Pakistan demographic and health survey (PDHS) 2006-07. *Middle East J Sci Res*. 2013;18(10):1440-1447. doi:10.5829/idosi.mejrs.2013.18.10.12418
22. Khanal V, Adhikari M, Karkee R, Gavidia T. Factors associated with the utilisation of postnatal care services among the mothers of Nepal: Analysis of Nepal Demographic and Health Survey 2011. *BMC Womens Health*. 2014;14(19):1-13. doi:10.1186/1472-6874-14-19
23. Mon AS, Phyu MK, Thinkhamrop W, Thinkhamrop B. Utilization of full postnatal care services among rural Myanmar women and

- its determinants: A cross-sectional study [version 1; peer review: 3 approved]. *F1000Res*. 2018;7(0):1-15. doi:10.12688/F1000RESEARCH.15561.1
24. Ndugga P, Namiyonga NK, Sebuwufu D. Determinants of early postnatal care attendance: Analysis of the 2016 Uganda demographic and health survey. *BMC Pregnancy Childbirth*. 2020;20(1):1-14. doi:10.1186/s12884-020-02866-3
  25. Hajizadeh M, Alam N, Nandi A. Social inequalities in the utilization of maternal care in Bangladesh: Have they widened or narrowed in recent years? *Int J Equity Health*. 2014;13(1):1-11. doi:10.1186/s12939-014-0120-4
  26. Khan MN, Kumar P, Rahman MM, Islam Mondal MN, Islam MM. Inequalities in utilization of maternal reproductive health care services in Urban Bangladesh: A population-based study. *SAGE Open*. 2020;10(1):1-9. doi:10.1177/2158244020914394
  27. Dadi LS, Berhane M, Ahmed Y, et al. Maternal and newborn health services utilization in Jimma Zone, Southwest Ethiopia: A community based cross-sectional study. *BMC Pregnancy Childbirth*. 2019;19(1):1-13. doi:10.1186/s12884-019-2335-2
  28. Sagawa J, Kabagenyi A, Turyasingura G, Mwale SE. Determinants of postnatal care service utilization among mothers of Mangochi district, Malawi: A community-based cross-sectional study. *BMC Pregnancy Childbirth*. 2021;21(1):1-11. doi:10.1186/s12884-021-04061-4
  29. Abuka Abebo T, Jember Tesfaye D. Postnatal care utilization and associated factors among women of reproductive age group in Halaba Kulito Town, Southern Ethiopia. *Arch Public Heal*. 2018;76(1):1-10. doi:10.1186/s13690-018-0256-6
  30. Tesfahun F, Worku W, Mazengiya F, Kifle M. Knowledge, perception and utilization of postnatal care of mothers in Gondar Zuria District, Ethiopia: A cross-sectional study. *Matern Child Health J*. 2014;18(10):2341-2351. doi:10.1007/s10995-014-1474-3
  31. Fekadu GA, Ambaw F, Kidanie SA. Facility delivery and postnatal care services use among mothers who attended four or more antenatal care visits in Ethiopia: Further analysis of the 2016 demographic and health survey. *BMC Pregnancy Childbirth*. 2019;19(1):64.
  32. Ayele B, Woldu M, Gebrehiwot H, et al. Do mothers who delivered at health facilities return to health facilities for postnatal care follow-up? A multilevel analysis of the 2016 Ethiopian demographic and health survey. *PLoS One*. 2021;16(4 April):1-14. doi:10.1371/journal.pone.0249793
  33. Mohan D, LeFevre AE, George A, et al. Analysis of dropout across the continuum of maternal health care in Tanzania: Findings from a cross-sectional household survey. *Health Policy Plan*. 2017;32(6):791-799. doi:10.1093/heapol/czx005
  34. Sebayang SK, Has EMM, Hadisyatmana S, Efendi F, Astutik E, Kuswanto H. Utilization of postnatal care service in Indonesia and its association with women's empowerment: An analysis of 2017 Indonesian demographic health survey data. *Matern Child Health J*. 2022;26(3):545-555. doi:10.1007/s10995-021-03324-y
  35. Chungu C, Makasa M, Chola M, Jacobs CN. Place of delivery associated with postnatal care utilization among childbearing women in Zambia. *Front Public Heal*. 2018;6(April):1-7. doi:10.3389/fpubh.2018.00094
  36. Nili NY. Postnatal care services and factors affecting its utilization in slum areas of Dhaka city. *IMC J Med Sci*. 2020;13(2):53-58. doi:10.3329/imejms.v13i2.45287
  37. Shahjahan M, Chowdhury HA, Al-Hadhrami AY, Harun GD. Antenatal and postnatal care practices among mothers in rural Bangladesh: A community based cross-sectional study. *Midwifery*. 2017;52:42-48. doi:10.1016/j.midw.2017.05.011
  38. Amin R, Shah NM, Becker S. Socioeconomic factors differentiating maternal and child health-seeking behavior in rural Bangladesh: A cross-sectional analysis. *Int J Equity Health*. 2010;9:1-11. doi:10.1186/1475-9276-9-9
  39. Choudhury N, Ahmed SM. Maternal care practices among the ultra poor households in rural Bangladesh: A qualitative exploratory study. *BMC Pregnancy Childbirth*. 2011;11:1-8. doi:10.1186/1471-2393-11-15
  40. National Institute of Population Research and Training (NIPORT), ICF International. Bangladesh demographic and health survey 2017–18. Published online 2020:1–511.
  41. National Institute of Population Research and Training - NIPORT/ Bangladesh, Mitra and Associates and II. Bangladesh Demographic and Health Survey 2014. 2016.
  42. MOHS, ICF. Myanmar Demographic and Health Survey 2015–16. Myanmar Demogr Heal Surv. Published online 2017:1–37. <https://dhsprogram.com/publications/publication-fr324-dhs-final-reports.cfm%0Ahttps://dhsprogram.com/pubs/pdf/FR324/FR324.pdf>
  43. Kumar Aryal K, Sharma SK, Nath Khanal M, et al. Maternal health care in Nepal: Trends and determinants ministry of health and population. 2018. <https://dhsprogram.com/pubs/pdf/FA118/FA118.pdf>
  44. Dansou J, Adekunle AO, Arowojolu AO. Factors associated with antenatal care services utilisation patterns among reproductive age women in Benin republic: An analysis of 2011/2012 Benin republic's demographic and health survey data. *Niger Postgrad Med J*. 2017;24(2):67-74. doi:10.4103/npmj.npmj\_16\_17
  45. Rwabufigiri BN, Mukamurigo J, Thomson DR, Hedt-Gautier BL, Semasaka JPS. Factors associated with postnatal care utilisation in Rwanda: A secondary analysis of 2010 demographic and health survey data. *BMC Pregnancy Childbirth*. 2016;16(1):1-8. doi:10.1186/s12884-016-0913-0
  46. Nzioki JM, Onyango RO, Ombaka JH. Socio-Demographic factors influencing maternal and child health service utilization in Mwingi; A rural semi-arid district in Kenya. *Am J Public Heal Res*. 2015;3(1):21-30. doi:10.12691/ajphr-3-1-4
  47. Ahmad R. Women twice as active as men in farm activities. Dhaka Tribune. <https://archive.dhakatribune.com/bangladesh/agriculture/2020/12/03/women-twice-as-active-as-men-in-farm-activities>. Published 2020.
  48. Ahmed HU. Women's contribution to agriculture. The Financial Express. <https://thefinancialexpress.com.bd/views/womens-contribution-to-agriculture-1535127549>. Published 2018.
  49. Chakma K, Ruba UB. Role of Bangladeshi women in diverse agricultural production: A review. *Eur J Agric Food Sci*. 2021;3(3):1-5. doi:10.24018/ejfood.2021.3.3.284
  50. BGMEA. What awaits RMG industry in 2022. Appar Story. Published online 2022:6–9. <https://www.bgmea.com.bd/uploads/newsletters/appare-story-january-february-2022.pdf>

51. Huque R, Hasan T. Health sector must focus more on budget implementation. *The Financial Express*. <https://thefinancialexpress.com.bd/views/health-sector-must-focus-more-on-budget-implementation-1625755694>. Published 2021.
52. World Bank. Out-of-pocket expenditure (% of current health expenditure) - Cameroon. World Health Organization Global Health Expenditure database. Published 2019. <https://data.worldbank.org/indicator/SH.XPD.OOPC.CH.ZS%0Ahttps://data.worldbank.org/indicator/SH.XPD.OOPC.CH.ZS?locations=ID>
53. Zamawe COF, Banda M, Dube AN. The impact of a community driven mass media campaign on the utilisation of maternal health care services in rural Malawi. *BMC Pregnancy Childbirth*. 2016;16(1):1-9. doi:10.1186/s12884-016-0816-0
54. Fatema K, Lariscy JT. Mass media exposure and maternal health-care utilization in South Asia. *SSM - Popul Heal*. 2020;11:100614. doi:10.1016/j.ssmph.2020.100614
55. Gebeyehu Workineh Y. Factors affecting utilization of postnatal care service in Amhara Region, Jabitena District, Ethiopia. *Sci J Public Heal*. 2014;2(3):169. doi:10.11648/j.sjph.20140203.15
56. Fantaye C, Melkamu G, Makeda S. Postnatal care service utilization and associated factors among mothers who delivered in Shebo Sombo Woreda, Jimma Zone, Ethiopia. *Int J Women's Heal Wellness*. 2018;4(2):1-7. doi:10.23937/2474-1353/1510078
57. Mohan D, Gupta S, LeFevre A, Bazant E, Killewo J, Baqui AH. Determinants of postnatal care use at health facilities in rural Tanzania: Multilevel analysis of a household survey. *BMC Pregnancy Childbirth*. 2015;15(1):1-10. doi:10.1186/s12884-015-0717-7

### Author Biographies

**Israt Tahira Sheba** is a lecturer of Health Economics at the Institute of Health Economics, University of Dhaka. She completed her master's degree in Health Economics from the University of Dhaka.

**Abdur Razzaque Sarker**, Health Economist research fellow at Bangladesh Institute of Development Studies (BIDS), obtained his PhD degree from University of Strathclyde, United Kingdom on Health Economics and Management Science.

**Afrida Tasnim** is a lecturer of Health Economics at the Institute of Health Economics, University of Dhaka. She completed her master's degree in Health Economics from the University of Dhaka.