



Bangladesh Maternal Mortality and Health Care Survey 2016

Preliminary Report



**BANGLADESH MATERNAL MORTALITY AND HEALTH CARE SURVEY
(BMMS) 2016**

Preliminary Report

**National Institute of Population Research and Training
International Centre for Diarrhoeal Disease Research, Bangladesh
MEASURE Evaluation**

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Government of the People's Republic of Bangladesh
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Information about the BMMS 2016 may be obtained from NIPORT, 13/1 Sheikh Shaheb Bazar, Azimpur, Dhaka 1205, Bangladesh (Telephone: 02-5861-1206; Web: www.niport.gov.bd).

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Foreword

Bangladesh Maternal Mortality and Health Care Survey (BMMS) 2016 is the third national survey designed to estimate the national maternal mortality ratio (MMR) in Bangladesh. The survey also aims to identify causes of maternal and non-maternal deaths to adult women and to provide health care utilization information including women's experience with antenatal, delivery, postnatal, emergency obstetric care and family planning.

The MMR in Bangladesh declined between 2001 and 2010 but has now stalled. The MMR estimate from the BMMS 2016 is 196 maternal deaths per 100,000 live births, almost identical to the estimate of BMMS 2010. Hemorrhage and eclampsia account for 55 percent of maternal deaths. The risk of dying from these causes remained unchanged between BMMS 2010 and BMMS 2016.

Considerable progress has been made in increasing the utilization of key maternal health services in Bangladesh. The percentage of births in health facilities increased from 23 percent in BMMS 2010 to 47 percent in BMMS 2016. The percentage of women receiving the complete continuum of maternity care (antenatal care, delivery care, and postnatal care from medically trained providers) has increased significantly from 19 percent in 2010, and to 43 percent in 2016. Seeking facility-based care for reported maternal complications has also increased from 29 percent to 46 percent between 2010 and 2016. However, delivery by C-section in Bangladesh is increasing at an alarming rate and substantially exceed WHO recommendations. C-section delivery increased from 12 percent in 2010 to 31 percent in 2016.

The information and interpretations presented in this report will be instrumental in determining strategic directions for the fourth Health, Population, and Nutrition Sector Program (4th HPNSP) and global commitment for Sustainable Development Goals (SDGs). This report presents the preliminary results for the major findings of the survey. More comprehensive report with policy implications of the findings will be published later.

BMMS 2016 has been conducted successfully due to the dedicated support and involvement of a large number of individuals and institutions. I am deeply indebted and grateful to all those who contributed to BMMS 2016. Because of their efforts, data could be made available in a timely fashion. I would like to put on record my sincere appreciation for the members of Stakeholder Advisory Committee and Technical Working Group, field staff, the data processing team, and particularly the survey respondents. I am thankful to MEASURE Evaluation, USA, icddr,b and USAID, Bangladesh for their technical assistance at every stages of survey. I sincerely extend my thanks to Mitra and Associates, and ACPR for completing the data collection on time. Government of Bangladesh, USAID and DFID funded BMMS 2016 and we acknowledge their contributions in accomplishing the entire survey.

(Rownaq Jahan)

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ABBREVIATIONS

ACPR	Associates for Community and Population Research
AMTSL	active management of the third stage of labor
ANC	antenatal care
ASFR	age-specific fertility rate
ASMMR	age-specific maternal mortality ratio
BEmOC	basic emergency obstetric care
BHFS	Bangladesh health facility survey
BMMS	Bangladesh Maternal Mortality and Health Care Survey
C-section	Cesarean section
CEmOC	comprehensive emergency obstetric care
CSBA	community skilled birth attendant
DC	delivery care
FWA	family welfare assistant
FWV	family welfare visitor
GFR	general fertility rate
HA	health assistant
HPNSDP	Health, Population and Nutrition Sector Development Program
HPNSP	Health, Population, Nutrition Sector Program
iccdr,b	International Centre for Diarrhoeal Disease Research, Bangladesh
MA	medical assistant
MDG	Millennium Development Goal
MMEIG	United Nations Maternal Mortality Estimation Inter-Agency Group
MMR	maternal mortality ratio
MOHFW	Ministry of Health and Family Welfare
NIPORT	The National Institute of Population Research and Training
NGO	nongovernmental organization
PNC	postnatal care
PRMR	pregnancy related mortality ratio
SACMO	sub-assistant community medical officer
SDG	sustainable development goal
UNDP	The United Nations Development Program
USAID	United States Agency for International Development

SECTION 1: BACKGROUND

INTRODUCTION

The Government of Bangladesh is committed to achieving its targets for Millennium Development Goal (MDG) 5: reducing the maternal mortality ratio (MMR) to 143 deaths per 100,000 live births by 2015 and increasing skilled attendance at birth to 50 percent by 2015 (United Nations Development Program [UNDP], 2015). The decline in MMR between 2001 and 2010 indicates remarkable progress. This progress is linked to fertility reduction, access to qualified maternal health care, and overall care seeking during the antenatal period and during delivery (UNDP, 2015). With the MDGs phasing out and the Sustainable Development Goals (United Nations, 2015) phasing in, the 4th Health, Population and Nutrition Sector Program 2017–2022 has set the target of reaching an MMR of 105 per 100,000 live births in 2022 (Ministry of Health and Family Welfare, 2017). Within this context, the 2016 Bangladesh Maternal Mortality and Health Care Survey (BMMS 2016) was carried out to assess how well the country is progressing toward these targets.

The BMMS 2016 was an activity under the Operational Plan of Training, Research and Development of the National Institute of Population Research and Training (NIPORT) under the Health, Population and Nutrition Sector Development Program (HPNSDP) 2011–2016 (Ministry of Health and Family Welfare, 2011).

The BMMS 2016 had the following objectives:

- Estimate the national level MMR in Bangladesh
- Identify the specific causes of maternal and non-maternal deaths among adult women
- Assess the pattern of antenatal, delivery, and postnatal care practices
- Assess maternal complications experience and care seeking
- Estimate childhood mortality rates
- Measure the level of selected maternal morbidities (obstetric fistula and pelvic organ prolapse)
- Provide district level socioeconomic, demographic, family planning and health care utilization indicators

Methodology

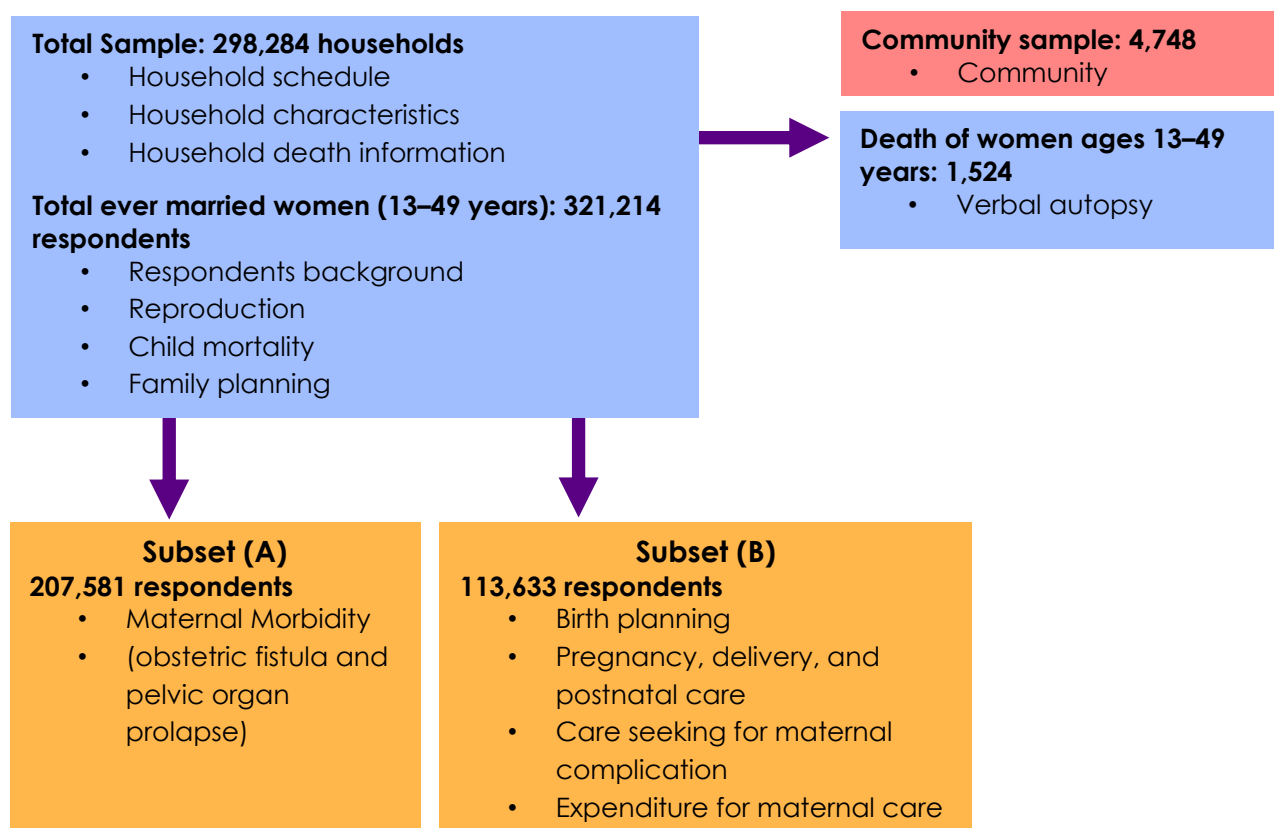
The BMMS 2016 sample size was designed to estimate the MMR with a similar level of relative precision to the estimate obtained in the 2010 BMMS, assuming that the MDG target of 143 per 100,000 live births had been met.

The BMMS 2016 used a multistage sampling procedure, using sampling frames derived from the 2011 census (Bangladesh Bureau of Statistics, 2011). In the first stage, wards and unions were used as the primary sample units in urban and rural areas, respectively. The second stage of sampling involved selecting two *mohallas* in each ward selected in the first stage and two mouzas in each union selected in the first stage.

Each selected *mohalla* and mouza was segmented into clusters, and one of these was selected from each selected *mohalla* and mouza. A total of 1,922 urban and 2,826 rural clusters were selected, for a total of 4,748 clusters overall. Of these clusters, 4,739 were successfully interviewed. Sixty-five households were randomly selected in each cluster to receive a household questionnaire. All ever-married women of these

households received a women’s questionnaire. In addition, the women of 42 of these households were randomly assigned to receive a subset of questionnaire A, and the women of the remaining 23 households were assigned to receive a subset of questionnaire B. The sample segregation of BMMS 2016 is presented below:

Figure 1.1. BMMS 2016 sample segregation



Survey Sample

Table 1.1 shows response rates for the survey. A total of 306,961 households were selected for the sample, and out of those, 298,284 households were successfully interviewed (a household response rate of 99 percent).

A total of 335,896 ever-married women ages 13–49 were eligible for the interview, of whom 321,214 were successfully interviewed (a response rate of 96 percent).

Table 1.1. Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Bangladesh 2016			
Result	Residence		Total
	Urban	Rural	
Household interviews			
Household selected	123,988	182,973	306,961
Household occupied	121,144	179,842	300,986
Household interviewed	119,726	178,558	298,284
Household response rate	98.8	99.3	99.1
Individual interviews with women age 13–49			
Eligible women	134,801	201,095	335,896
Eligible women interviewed	129,249	191,965	321,214
Eligible women response rate	95.9	95.5	95.6

Questionnaires

The survey employed six questionnaires, each based on the 2010 BMMS questionnaire design, in order to insure maximum comparability with 2010 estimates.

The Household Questionnaire gathered information on the age, sex, and education among all usual household members and the environmental circumstances of the household (household materials, water sources, etc.) and household ownership of assets. The household questionnaire asked about any deaths of household members in the five years preceding the survey, to identify adult female deaths (ages 13–49 years).

The Women’s Questionnaire gathered information on respondents’ background, reproduction, child mortality, and family planning from 321,214 ever-married women (weighted) ages 13–49 years.

The Subset A Questionnaire was used to gather data from 207,581 eligible women (weighted) concerning their maternal morbidity—focusing on obstetric fistula and pelvic organ prolapse.

The Subset B Questionnaire was used to gather data from 113,633 eligible women (weighted) concerning the following:

- Birth planning
- Pregnancy, delivery, and postnatal care
- Care seeking for maternal complication
- Expenditure for maternal care

The Verbal Autopsy Questionnaire was used to collect information on causes of death for all female adult deaths in the household in the three years preceding the survey. The questionnaire included both structured (pre-coded questions) and unstructured (open-ended) questions, which were answered by the most knowledgeable member of the household.

The Community Questionnaire was used to collect data on the socioeconomic condition of the community as well as data on the accessibility and availability of health and family planning services. One community questionnaire was completed for each selected cluster. Subsequently, this questionnaire was supplied to the interviewer teams for the main survey for identifying the specific sources of services used by respondents.

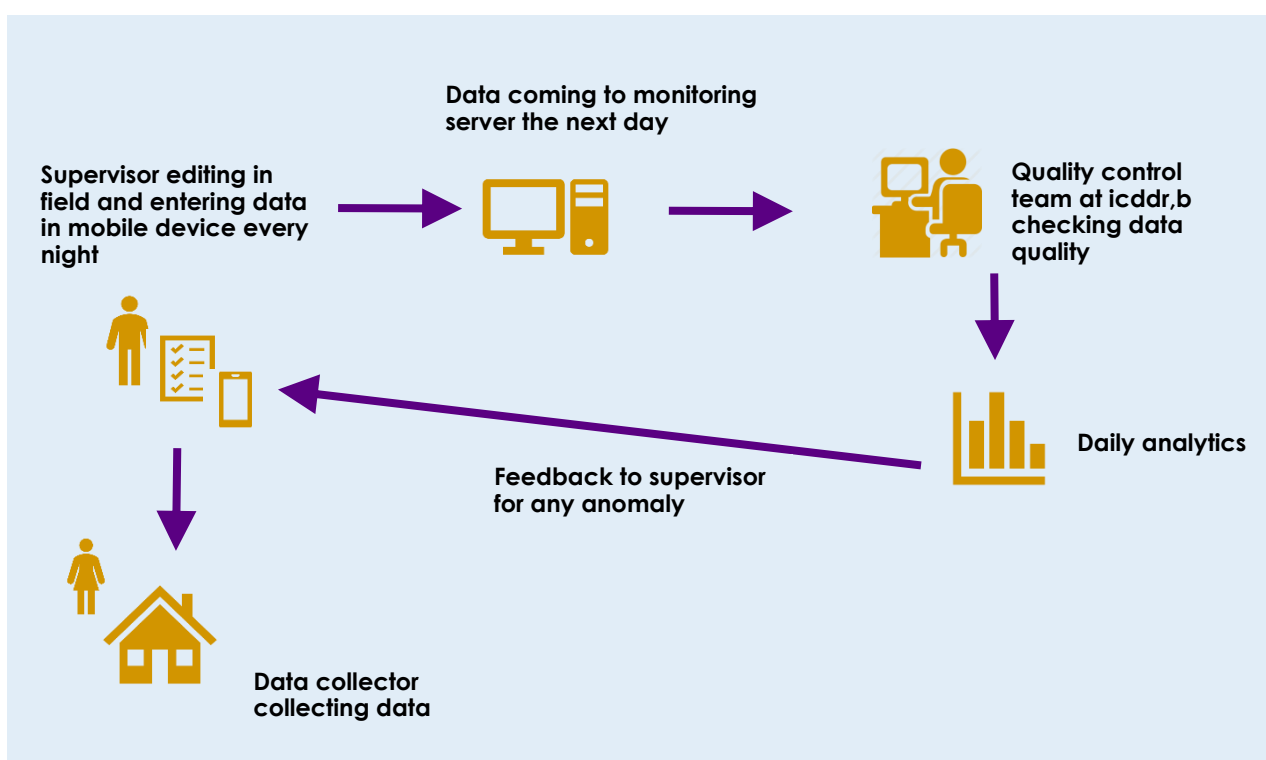
Fieldwork

Field data collection started on 22 August 2016 and was completed on 10 February 2017. The survey was carried out by 90 interviewing teams in six phases. All interviewers were trained for 23 days. Each data-collection team consisted of one male supervisor, one female editor, and five female interviewers.

Quality Control

The data-collection agencies for BMMS 2016 fielded quality control teams to check on the fieldwork and ensure the quality of the data. The National Institute of Population Research and Training also deployed seven, and the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) deployed three, quality control teams to monitor and observe the interviewer activities to ensure data quality. The MEASURE Evaluation team visited at least eight clusters in each phase to observe the quality of data collection. In addition, icddr,b developed a mobile dashboard for real-time data monitoring. The schematic diagram of the mobile monitoring system used in BMMS 2016 is presented below:

Figure 1.2. Quality control pathway using mobile device and dashboard



The BMMS 2016 technical working group also monitored the data coming from the field through different computer-based consistency checks. Feedback was given to teams through a debriefing session after each phase of the survey, to improve the quality of data.

Implementing Organizations

The 2016 Bangladesh Maternal Mortality and Health Care Survey was conducted under the authority of NIPORT of the Ministry of Health and Family Welfare. MEASURE Evaluation and icddr,b provided technical assistance in all phases of the survey. Moreover, two local research firms (Mitra and Associates and Associates for Community and Population Research) were employed for field data collection, data editing, and data entry.

Funding Sources

BMMS 2016 was funded by the Government of People's Republic of Bangladesh, the United States Agency for International Development, and the Department for International Development.

SECTION 2: BACKGROUND CHARACTERISTICS

SUMMARY

- In 2016, 10 percent of ever-married women who responded to the survey were 15–19 years old, compared to 15 percent in 2001. The proportion of ever-married women ages 35–49 increased from 32 percent, in BMMS 2001, to 37 percent, in BMMS 2016. The change in age of women who responded to the survey, between BMMS 2010 and BMMS 2016, was very slight.
- The level of education of women continues to increase. In the past six years, the proportion of ever-married women ages 15–49 with no education decreased from 34 percent to 21 percent, while the proportion who attended secondary school has increased from 36 percent to 47 percent.
- The economic status of Bangladeshi households continues to improve. Three indicators reflect this improvement. Between 2010 and 2016, the number of households that had electricity, access to improved toilet, and non-*kacha* dwelling walls increased from 55 to 79 percent, 60 to 83 percent, and 67 to 85 percent, respectively. Poor households (those in the bottom two wealth quintiles) also had substantial improvements in these indicators in the past six years.
- Nearly all households (94 percent) own a mobile phone. In 2010, two in three households had a mobile phone.

Table 2.1. Household population by age, sex, and residence

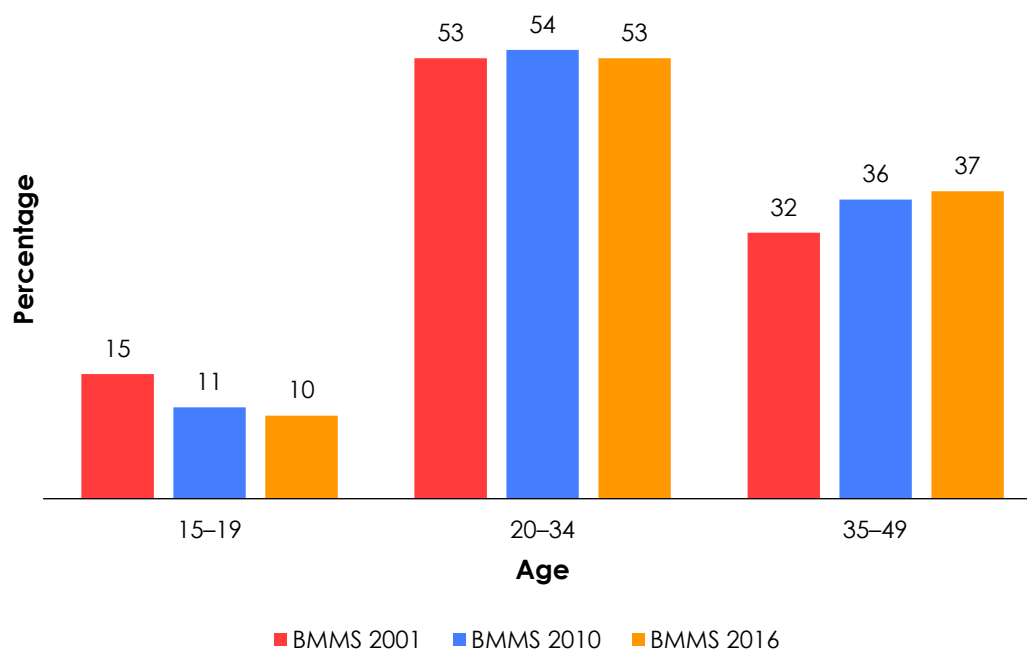
Percentage distribution of the de facto household population by five-year age groups, according to sex and residence, Bangladesh 2016									
Age group	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0–4	10.3	9.6	9.9	11.1	10.0	10.5	10.9	9.9	10.4
5–9	10.6	9.9	10.2	11.7	10.5	11.1	11.4	10.3	10.8
10–14	10.9	10.3	10.6	12.0	11.3	11.6	11.7	11.0	11.3
15–19	9.9	11.5	10.7	9.8	10.9	10.4	9.8	11.1	10.5
20–24	7.6	10.9	9.3	6.7	9.7	8.2	6.9	10.0	8.5
25–29	8.7	10.1	9.4	7.1	8.8	8.0	7.5	9.1	8.4
30–34	7.6	8.5	8.0	6.2	7.7	6.9	6.6	7.9	7.2
35–39	7.8	7.0	7.4	6.8	6.3	6.5	7.1	6.5	6.8
40–44	5.9	5.5	5.7	5.2	5.4	5.3	5.4	5.4	5.4
45–49	5.4	5.3	5.4	4.9	5.8	5.4	5.1	5.6	5.4
50–54	4.1	1.8	2.9	4.2	1.7	2.9	4.1	1.7	2.9
55–59	3.0	3.1	3.1	3.3	3.6	3.5	3.2	3.4	3.3
60–64	2.9	2.6	2.8	3.4	3.2	3.3	3.3	3.0	3.1
65–69	2.0	1.5	1.7	2.5	1.8	2.2	2.4	1.8	2.1
70–74	1.6	1.1	1.4	2.4	1.5	1.9	2.2	1.4	1.8
75–79	0.7	0.5	0.6	1.1	0.6	0.8	1.0	0.6	0.8
80+	0.9	1.0	1.0	1.6	1.4	1.5	1.4	1.3	1.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	176,027	184,407	360,435	450,495	488,007	938,502	626,523	672,414	1,298,937

- In 2016, almost one-third of the de facto household population (33 percent) were under 15 years of age, and six percent were age 65 or over (Table 2.1).
- In 2010, 35 percent of the population were under age 15, and five percent were age 65 or above—indicating that the Bangladesh population is slowly aging.

Table 2.2. Background characteristics of respondents

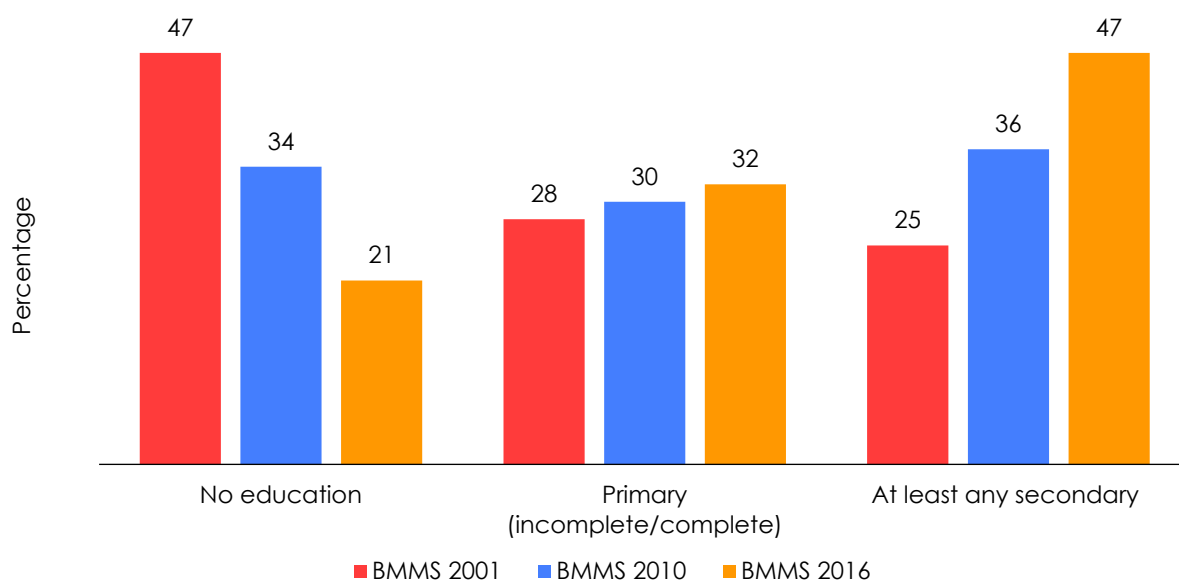
Percentage distribution of ever-married women ages 15–49 by selected background characteristics, Bangladesh, 2016			
Background characteristic	Weighted percentage	Number of women	
		Weighted	Unweighted
Age			
15–19	10.1	31,933	30,890
20–24	18.0	56,748	55,553
25–29	18.4	57,970	57,266
30–34	16.5	51,935	52,173
35–39	13.6	42,721	43,475
40–44	11.5	36,111	36,840
45–49	11.8	37,219	38,490
Residence			
Urban	28.1	88,323	126,833
Rural	71.9	226,314	187,854
Division			
Barisal	5.5	17,355	28,143
Chittagong	19.0	59,674	49,607
Dhaka	26.9	84,551	55,716
Khulna	11.4	35,744	40,621
Mymensingh	7.6	23,770	30,719
Rajshahi	12.8	40,160	42,526
Rangpur	11.4	35,899	40,195
Sylhet	5.6	17,484	27,160
Educational attainment			
No education	20.7	64,981	63,304
Primary incomplete	18.1	57,058	55,822
Primary complete	14.1	44,500	44,695
Secondary incomplete	31.2	98,061	97,062
Secondary complete or higher	15.9	50,037	53,804
Marital status			
Currently married	93.9	295,402	295,209
Separated	1.0	3,209	3,090
Deserted	0.4	1,327	1,262
Divorced	1.1	3,304	3,256
Widowed	3.6	11,395	11,870
Total	100.0	314,637	314,687

Figure 2.1. Trends in age of ever-married women who responded, BMMS 2001, 2010 and 2016



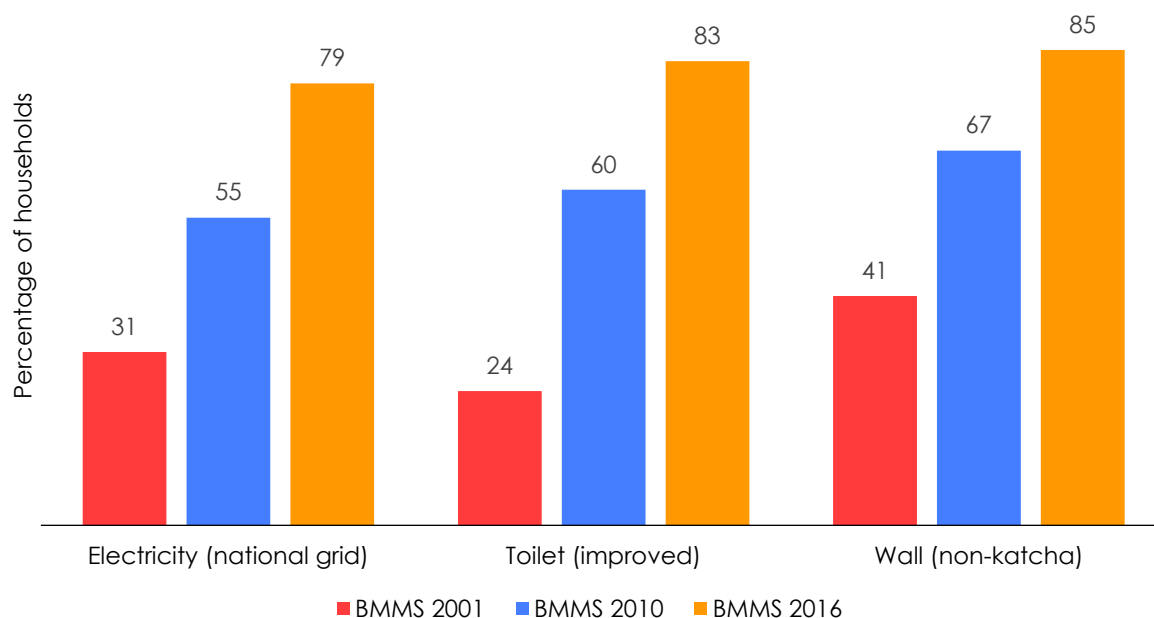
- Ever-married women ages 15–49 years who responded to BMMS 2016 were slightly older compared to the BMMS 2001 respondents, reflecting the shift in overall age structure of the population towards the older age group. In BMMS 2016, 10 percent of the respondents were 15–19 years old, compared to 15 percent in BMMS 2001. On the other hand, the percentage of respondents ages 35–49 was higher in BMMS 2010 (37 percent), compared to BMMS 2001 (32 percent) (Table 2.2, Figure 2.1).
- Dhaka constituted the largest proportion of the sample (27 percent) followed by Chittagong (19 percent).

Figure 2.2. Trends in respondents' education (ever-married women ages 15–49), BMMS 2001, 2010, and 2016



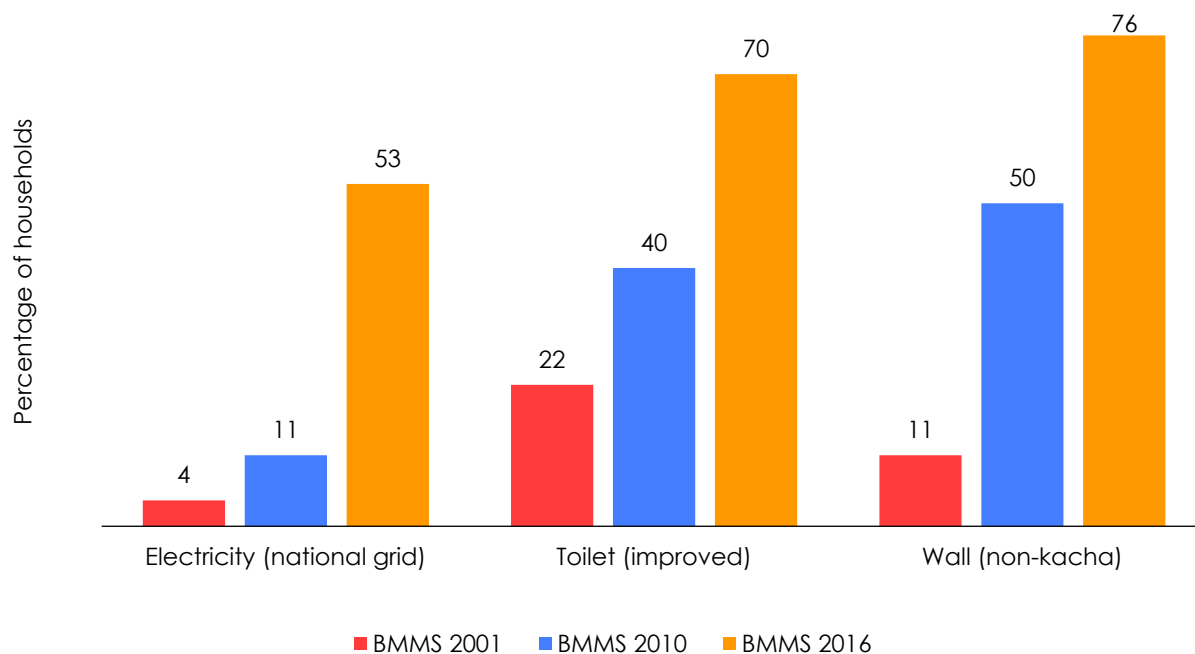
- The proportion of ever-married women respondents with no education decreased from 34 percent to 21 percent between 2010 and 2016. In 2001, almost half of the respondents had no education (Figure 2.2).
- The proportion of respondents who attended secondary school has increased from 36 percent to 47 percent in the past six years.

Figure 2.3. Trends in household socioeconomic indicators: BMMS 2001, 2010, and 2016



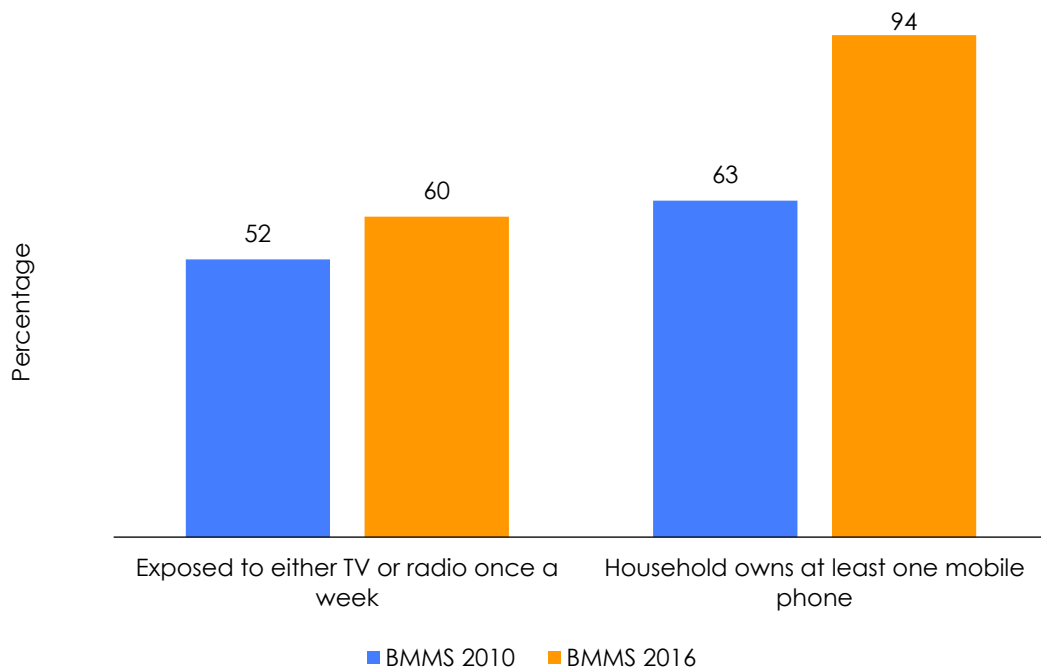
- Economic status of households increased markedly between BMMS 2001 and BMMS 2010. A similar trend continued between BMMS 2010 and BMMS 2016, which is reflected by three indicators: whether a household had electricity, an improved toilet, or the dwelling had non-*kacha* walls (Figure 2.3).
- Four out of five households in Bangladesh have access to electricity (national grid). During the past six years, the proportion of households that had electricity increased by 24 percentage points, from 55 percent in 2010 to 79 percent in 2016.
- A substantial proportion of Bangladeshi households (83 percent) now have access to an improved toilet facility.
- In BMMS 2016, most dwellings (85 percent) had non-*kacha* walls. In BMMS 2010, 67 percent—and in BMMS 2001, 41 percent—had non-*kacha* walls.

Figure 2.4. Trends in socioeconomic indicators among households in the two lowest wealth quintiles: BMMS 2001, 2010, and 2016



- The economic status of poor households (those in bottom two wealth quintiles) has also improved in the past six years.
- In 2016, more than half of poor households had access to electricity (national grid). In 2010, only one in ten poor household had electricity (Figure 2.4).
- Seven out of ten poor households now have access to improved toilets, compared to four out of ten households, six years ago.
- The quality of dwellings of poor households has also improved between 2010 and 2016, measured by whether the walls of the dwelling were non-*kacha*.

Figure 2.5. Access to communication channels: BMMS 2010 and 2016



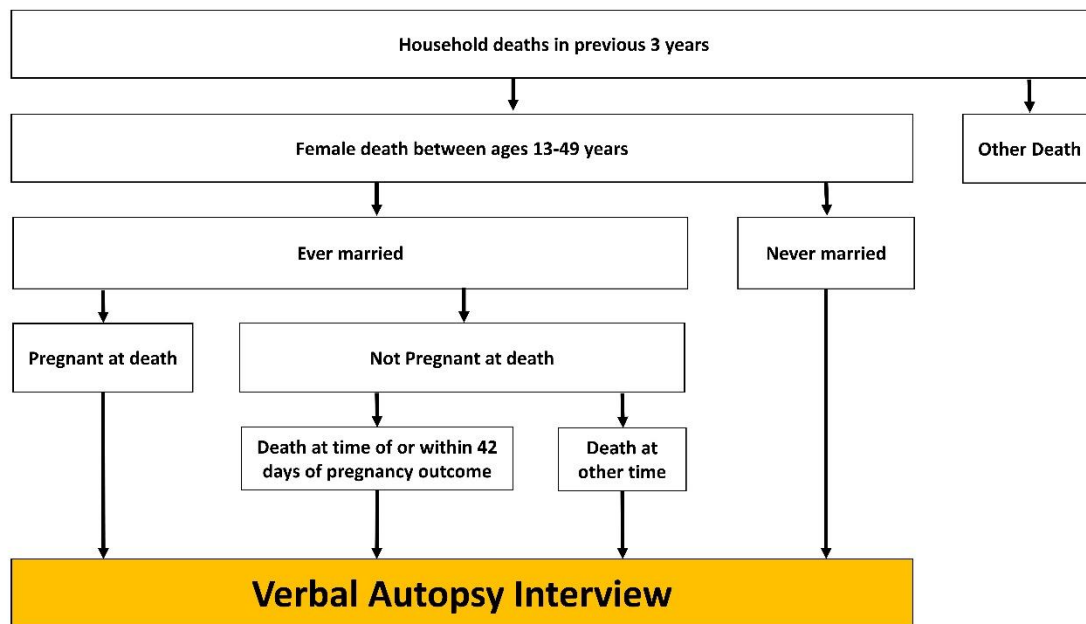
- Sixty percent of women who responded to the survey are exposed to either television or radio at least once a week. There was a slight increase in this exposure between 2010 and 2016 (Figure 2.5).
- Household ownership of a mobile phone has now become almost universal (94 percent). In 2010, 63 percent of households had a mobile phone.

SECTION 3: MATERNAL MORTALITY

SUMMARY

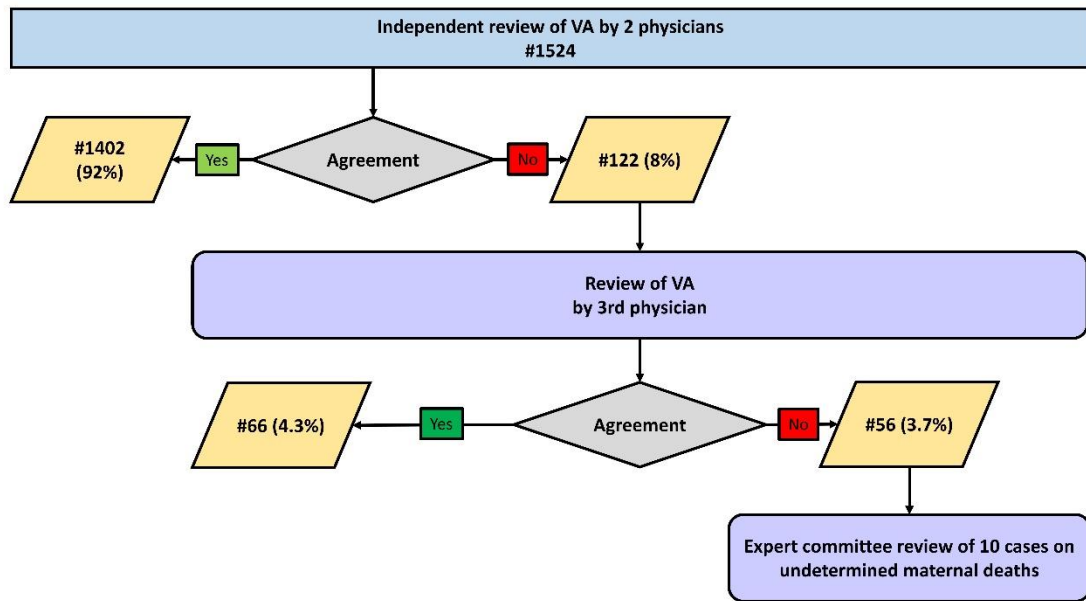
- The estimated maternal mortality ratio (MMR) in BMMS 2016 is 196 per 100,000 live births; this rate has remained almost unchanged in Bangladesh since 2010.
- Maternal mortality now accounts for around 13% of all adult female deaths, with no apparent change from the BMMS 2010 estimate (14%).
- For all age groups, the MMR was comparable between BMMS 2010 and BMMS 2016, except in the youngest age group (15–19 years), where it was higher in 2016.
- The risk of maternal death is high among first-time mothers (215 per 100,000 live births) as well as for parities 4 or higher.
- Hemorrhage was the most common cause of maternal mortality, followed by eclampsia, indirect causes, and abortion-related complications.
- Hemorrhage and eclampsia account for 54% of all maternal deaths in BMMS 2016, slightly higher than in BMMS 2010 (51%).
- The proportionate contribution of indirect causes of maternal death has declined from 35% in BMMS 2010 to 20% in BMMS 2016.
- The major causes of adult female deaths are cancers (24%), circulatory diseases (23%), and maternal (13%).

Figure 3.1. Verbal autopsy determinations



- The BMMS 2016 used the “household deaths” approach to measure maternal mortality. It used both a time of death and a verbal autopsy approach to identify pregnancy-related and maternal deaths, respectively, among deaths of women of reproductive age (13–49 years) reported by households in the three years preceding the survey.
- The Household Questionnaire included a section about deaths of residents of the household since October 2012.
- If any death was reported from a household, further details regarding the name, sex, age at death, and month and year of death were collected.
- Subsequent verbal autopsy interviews were conducted for all deaths reported among women ages 13–49 years at the time of death. However, the analysis presented here was limited to women ages 15–49 years. The interviews were conducted with the household member who knew the most about the deceased person.

Figure 3.2. The cause of death review process



- Cause of death was determined by physician review of the verbal autopsy questionnaire.
- Two physicians independently reviewed each case.
- If these physicians could not agree, the case was reviewed by a third physician.
- An expert committee of obstetricians helped assign a specific cause of maternal death when the physicians agreed that the death was maternal but could not reach consensus to assign a specific cause (#10). The remaining 46 non-maternal deaths for which consensus could not be reached were categorized as unclassified.
- The International Classification of Diseases Revision 10 was used to assign causes of death.

Maternal Mortality in Bangladesh: Levels and Causes

Table 3.1. Pregnancy-related mortality ratios per 100,000 live births in the three years preceding the survey, by maternal age, Bangladesh, 2016

	Mortality						Age-specific fertility rate (ASFR) and age-specific PRMR	
	Exposure time (women years)	Deaths during pregnancy ¹	Deaths during delivery ¹	Deaths post-partum ¹	Total pregnancy-related deaths ¹	Pregnancy-related mortality rate ²	ASFR ³	ASPRMR ⁴
Maternal age								
15–19	221,051.023	12.626	1.610	18.821	33.057	0.150	0.104	143.611
20–24	190,825.590	7.040	3.715	24.790	35.546	0.186	0.147	126.706
25–29	176,606.936	16.144	3.571	16.991	36.706	0.208	0.109	191.508
30–34	150,600.872	12.108	5.206	16.469	33.783	0.224	0.058	383.598
35–39	123,488.496	11.231	1.487	11.813	24.531	0.199	0.022	919.535
40–44	110,372.538	2.159	0.000	0.989	3.148	0.029	0.005	606.970
45–49	86,298.287	1.501	0.000	0.000	1.501	0.017	0.001	2,031.243
General								
Total	1,059,243.740	62.809	15.589	89.873	168.271	0.157	2.227	-
GFR ⁵	-	-	-	-	-	-	0.076	-
PRMR ⁶	-	-	-	-	-	-	-	205.559 ⁷

Note: Information from the Household and Verbal Autopsy Questionnaire, considers de jure female household population in exposure, gets pregnancy-related deaths from a list of usual members who died in the three years before the survey and from the verbal autopsy questionnaire, and assumes the same fertility rates as de facto women interviewed.

¹ Deaths are weighted, hence, the number of deaths is not a round number.

² Deaths per 1,000

³ Births per women

⁴ Deaths per 100,000 live births

⁵ GFR=General fertility rate

⁶ PRMR=Pregnancy-related mortality ratio

⁷ 95% confidence interval: 169 to 244

- The overall pregnancy-related mortality ratio (PRMR) is 206 per 100,000 live births (95% confidence interval [CI]: 169–244) in BMMS 2016. This compares to 201 per 100,000 live births (95% CI: 160–245) in BMMS 2010.
- The PRMR among the youngest women (15–19 years) is higher in BMMS 2016 (144 deaths per 100,000 live births) than in BMMS 2010 (75 deaths per 100,000 live births).
- The lowest PRMR is among women ages 20–24 years (127 per 100,000 live births).
- The PRMR increases with age among women age 30 years or more, with the highest PRMR among women ages 45–49 (2031 per 100,000 live births).
- Although the pregnancy-related mortality ratio (deaths per 100,000 live births) has remained unchanged, the pregnancy-related mortality rate (deaths per 1,000 years of exposure) has declined by 11% between BMMS 2010 and BMMS 2016.

Table 3.2. Maternal mortality ratios per 100,000 live births in the three years preceding the survey, by maternal age, Bangladesh, 2016.

	Mortality						Age-specific fertility and age-specific MMR	
	Exposure time (women-years)	Deaths during pregnancy ¹	Deaths during delivery ¹	Deaths post-partum ¹	Total maternal deaths ¹	Maternal mortality rate ²	ASFR ³	ASMMR ⁴
Maternal age								
15–19	221,051.023	4.739	4.566	21.596	30.901	0.140	0.104	134.246
20–24	190,825.590	6.580	0.202	31.634	38.416	0.201	0.147	136.937
25–29	176,606.936	9.434	3.878	20.563	33.874	0.192	0.109	176.730
30–34	150,600.872	9.986	1.394	22.402	33.783	0.224	0.058	383.598
35–39	123,488.496	8.027	0.000	12.019	20.046	0.162	0.022	751.420
40–44	110,372.538	0.000	0.679	0.989	1.667	0.015	0.005	321.441
45–49	86,298.287	0.276	0.000	1.225	1.501	0.017	0.001	2,031.243
Total	1,059,243.740	39.042	10.718	110.427	160.188	0.149	2.227	-
GFR ⁵	-	-	-	-	-	-	0.076	-
MMR ⁶	-	-	-	-	-	-	-	195.862 ⁷

Note: information from the household and verbal autopsy questionnaires, considers de jure female household population in exposure, gets maternal deaths from listing with usual members who died in the three years before the survey and from verbal autopsy questionnaire, and assumes the same fertility rates as de facto women interviewed.

¹ Deaths are weighted, hence, the number of deaths is not a round number.

² Deaths per 1,000

³ Births per woman

⁴ Deaths per 100,000 live births

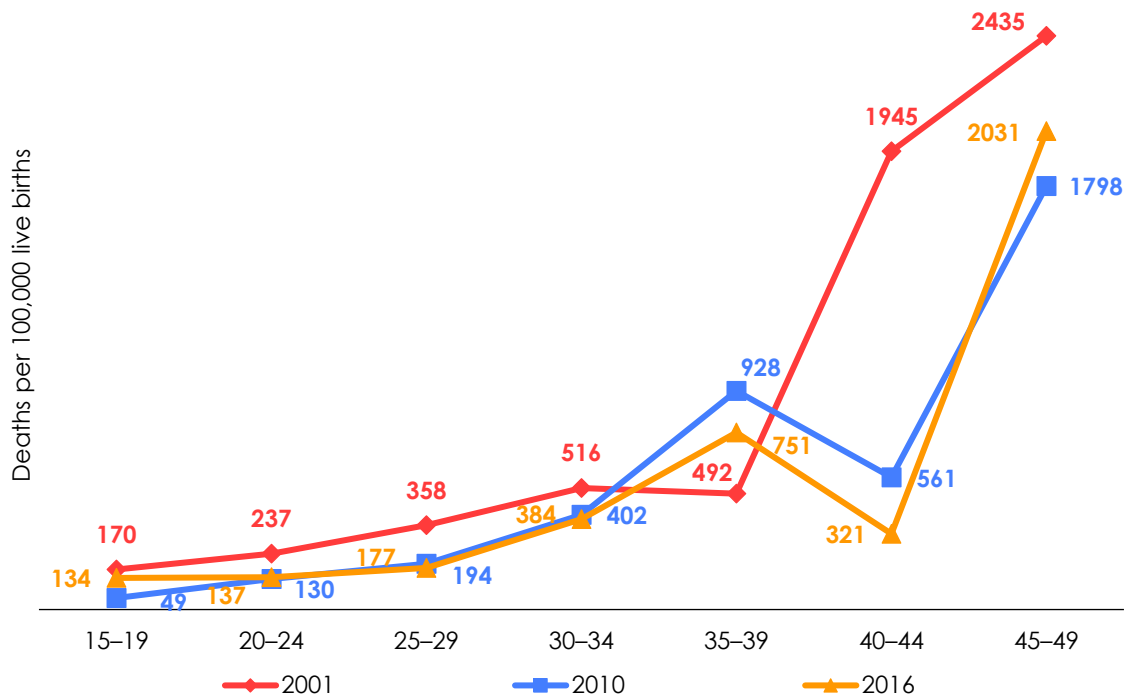
⁵ GFR = General fertility rate

⁶ MMR = Maternal mortality ratio

⁷ 95% confidence interval: 159 to 234

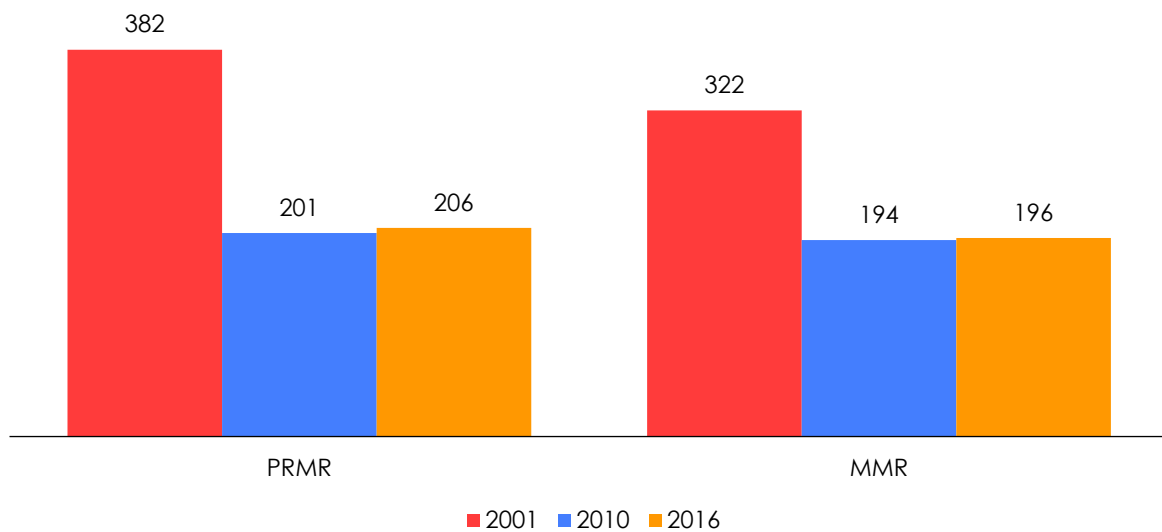
- The overall MMR is 196 per 100,000 live births (95% CI: 159–234) in BMMS 2016. This is similar to the BMMS 2010 estimate of 194 per 100,000 live births (95% CI: 153–236).
- The lowest MMR is among women ages 15–19 years (134 per 100,000 live births).
- The highest MMR is among women ages 45–49 (2031 per 100,000 live births).
- Although the MMR (per 100,000 live births) has remained unchanged, the maternal mortality rate (deaths per 1000 years of exposure) has declined by 12.5% between BMMS 2010 and BMMS 2016.

Figure 3.3. Age-specific maternal mortality ratios per 100,000 live births



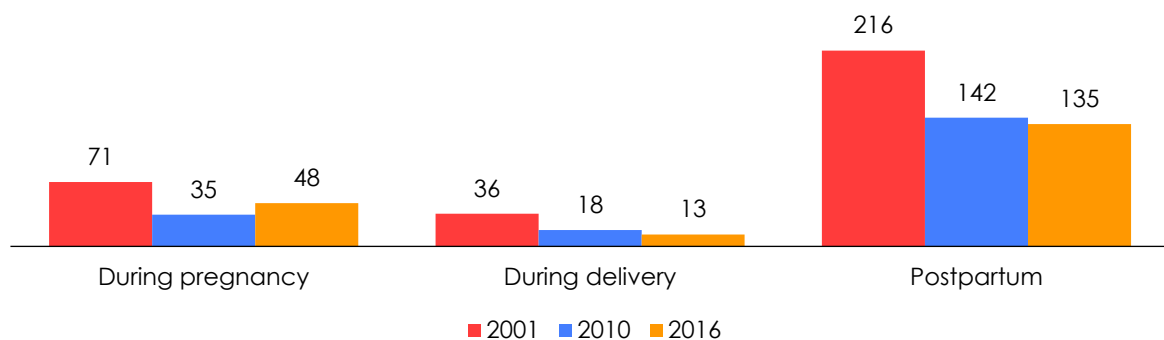
- MMR rises steeply with age, and the pattern is consistent in all three surveys (BMMS 2001, BMMS 2010, and BMMS 2016).
- At almost all ages, the MMR in BMMS 2010 and BMMS 2016 are similar and lower than in BMMS 2001.

Figure 3.4. Pregnancy-related maternal mortality ratio (PRMR) and maternal mortality ratio (MMR) (per 100,000 live births): Comparison between BMMS 2001, BMMS 2010, and BMMS 2016



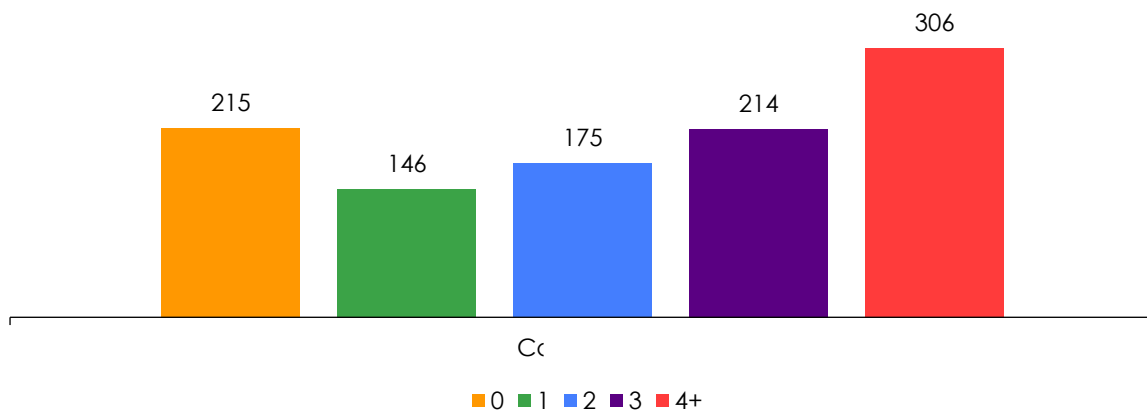
- Figure 3.4. Demonstrates the stagnation of both PRMR and MMR, between BMMS 2010 and BMMS 2016, after significant declines from BMMS 2001.

Figure 3.5. Maternal mortality ratios (MMR) (per 100,000 live births) by timing of death—during pregnancy, during delivery, and postpartum: Comparison between BMMS 2001, BMMS 2010, and BMMS 2016



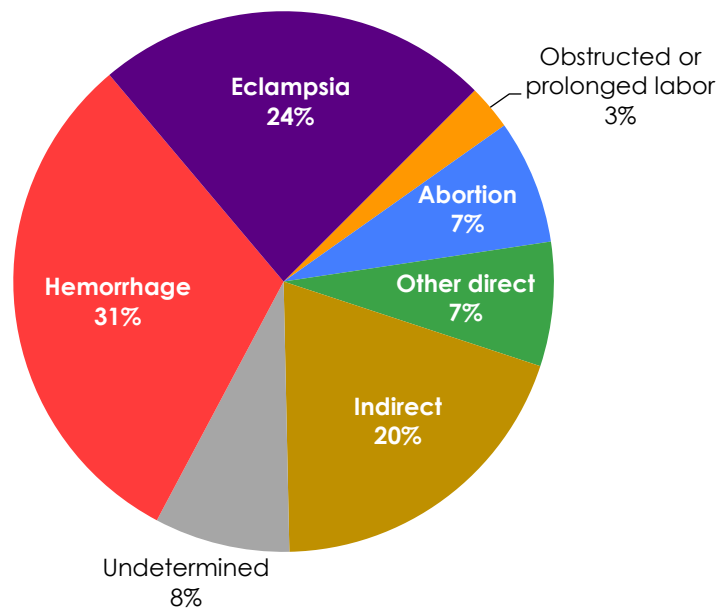
- The MMR is highest during the postpartum period. This pattern is consistent in BMMS 2001, BMMS 2010, and BMMS 2016.
- The MMR during the delivery and postpartum periods is slightly lower in BMMS 2016 compared to BMMS 2010.

Figure 3.6. Maternal Mortality Ratios (MMR) (per 100,000 live births) by previous parity, Bangladesh 2016



- The risk of maternal death is the highest among women with parity 4 or higher.
- The lowest risk of maternal death is among women who have had one previous live birth.

Figure 3.7. Percentage distribution of causes of maternal deaths, Bangladesh, 2016



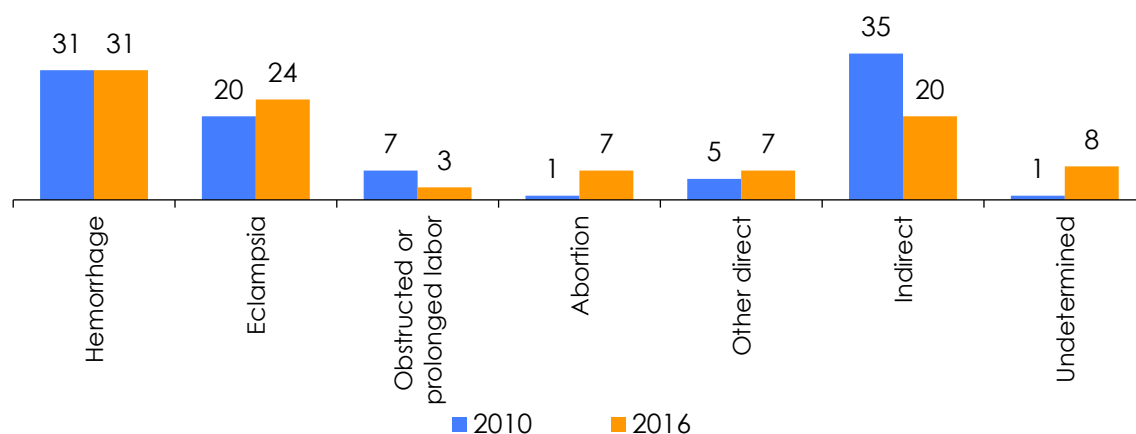
- Ante and postpartum hemorrhage (31%) and eclampsia and preeclampsia (24%) are the most common causes of maternal death, followed by indirect causes (20%), abortions (7%), and obstructed or prolonged labor (3%).
- One-fifth of the maternal deaths have indirect causes.

Table 3.3. Cause-specific maternal death rates for the three years before the survey, by age, Bangladesh 2016.

Maternal age	Exposure time (women-years)	Direct obstetric death ¹					Indirect obstetric death ¹	Undetermined maternal death ¹	Maternal mortality rate ¹
		Hemorrhage (ante- and postpartum)	Eclampsia	Obstructed/prolonged labor	Abortion-related death	Other direct			
15–19	221,051.023	0.023	0.049	0.011	0.000	0.020	0.024	0.013	0.140
20–24	190,825.590	0.060	0.056	0.000	0.019	0.018	0.033	0.015	0.201
25–29	176,606.936	0.057	0.025	0.005	0.011	0.024	0.045	0.025	0.192
30–34	150,600.872	0.086	0.047	0.009	0.027	0.000	0.035	0.019	0.224
35–39	123,488.496	0.062	0.042	0.000	0.007	0.000	0.051	0.000	0.162
40–44	110,372.538	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.015
45–49	86,298.287	0.000	0.000	0.000	0.014	0.000	0.003	0.000	0.017
Total	1,059,243.740	0.046	0.035	0.004	0.011	0.011	0.029	0.012	0.149

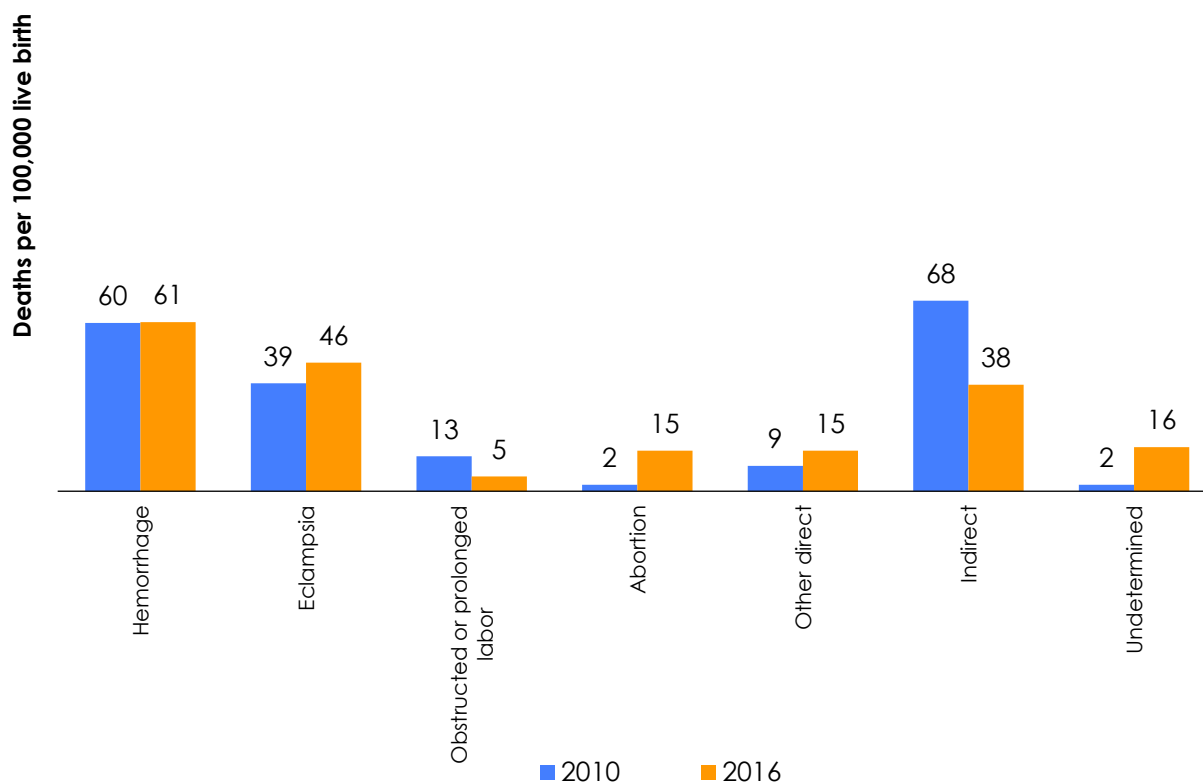
¹Deaths per 1,000 woman-years of exposure

Figure 3.8. Percentage distribution of causes of maternal deaths: Comparison between BMMS 2010 and BMMS 2016



- Ante and postpartum hemorrhage is an important cause of death among women ages 20–39 years, particularly among women 30–34 years old.
- Eclampsia/preeclampsia is an important cause of death among women younger than 40 years.
- Obstructed or prolonged labor was most common among the youngest women (15–19 years).
- Abortion-related deaths peaked among women 30–34 years old.
- Indirect obstetric causes were most common among women ages 25–39 years.

Figure 3.9. Cause-specific maternal mortality ratios: Comparison between BMMS 2010 and BMMS 2016



- The proportionate contribution of hemorrhage among all maternal deaths remained unchanged between BMMS 2010 and BMMS 2016. The cause-specific mortality ratios specific to hemorrhage also did not change between the two periods.
- The cause-specific mortality ratio due to indirect causes decreased from 68 per 100,000 live births in BMMS 2010 to 38 per 100,000 live births in BMMS 2016, resulting in a decrease in the proportionate contribution of indirect causes from 35% to 20% among all maternal deaths.
- The cause-specific mortality ratio due to eclampsia increased from 39 per 100,000 live births in BMMS 2010 to 46 per 100,000 live births in BMMS 2016; consequently, the proportionate contribution of eclampsia increased from 20% to 24% among all maternal deaths.
- The contribution of abortion as a cause of death increased between 2010 and 2016: The cause-specific mortality ratio increased from 2 to 15 per 100,000 live births, and the proportionate contribution increased from 1% to 7%.

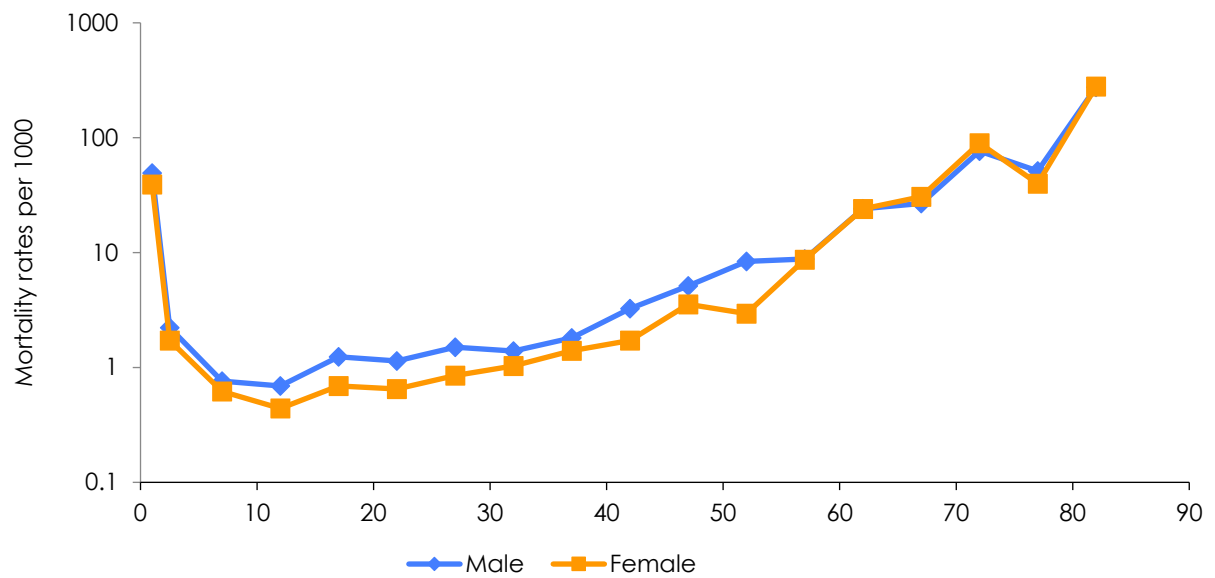
Overall Adult Mortality

Table 3.4. Age-specific mortality rates per person in the three years preceding the survey, by sex, Bangladesh, 2016

Age group	Male			Female		
	Deaths	Exposure	Mortality rates	Deaths	Exposure	Mortality rates
< 1	1,822.2	36,951.9	0.04931	1,415.9	36,118.3	0.03920
1-4	369.2	166,264.6	0.00222	278.1	161,885.2	0.00172
5-9	167.7	220,122.6	0.00076	132.8	213,423.1	0.00062
10-14	148.8	216,800.3	0.00069	96.3	217,082.2	0.00044
15-19	217.9	176,158.4	0.00124	152.8	221,051.0	0.00069
20-24	164.8	145,167.3	0.00114	123.9	190,825.6	0.00065
25-29	236.8	158,047.3	0.00150	150.1	176,606.9	0.00085
30-34	192.1	137,993.0	0.00139	154.7	150,600.9	0.00103
35-39	227.2	125,500.8	0.00181	172.4	123,488.5	0.00140
40-44	322.2	99,137.9	0.00325	190.2	110,372.5	0.00172
45-49	478.4	93,170.5	0.00513	306.0	86,298.3	0.00355
50-54	577.6	68,936.7	0.00838	161.0	54,780.0	0.00294
55-59	615.5	70,054.8	0.00879	716.2	82,444.7	0.00869
60-64	1,280.6	53,211.2	0.02407	1,207.5	50,224.4	0.02404
65-69	1,299.6	48,611.8	0.02673	1,070.8	34,993.2	0.03060
70-74	2,000.1	26,187.2	0.07638	1,517.6	16,899.6	0.08980
75-79	1,115.2	21,693.2	0.05141	723.4	18,163.4	0.03983
80+	4,209.5	15,305.3	0.27504	4,365.8	15,643.5	0.27908
Total						
Total	15,445.4	1,879,315.0	0.00822	12,935.8	1,960,901.4	0.00660
Probability of dying						
35q15	-	-	0.07440	-	-	0.04823

Note: Rates are based on data from the Household Questionnaire: deaths from the household listing in the three years before the survey.

Figure 3.10. Age-specific mortality rates in the three years preceding the survey, by sex, Bangladesh, 2016



- The risk of death is high in early childhood, dropping to a minimum at age 10–14 years and then rising steadily into old age.
- Mortality risk is higher among men than women at all ages below 60 years.

Figure 3.11. Age-specific (15–49 years) female mortality rates per 100,000, Bangladesh, 2016

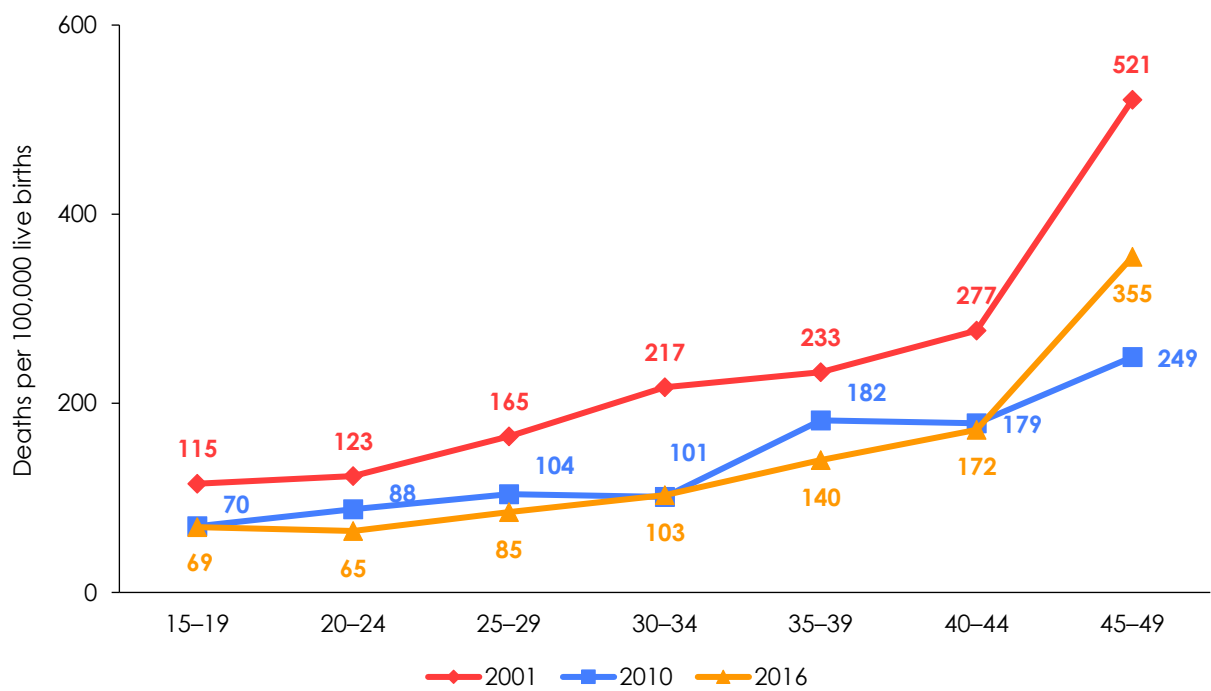
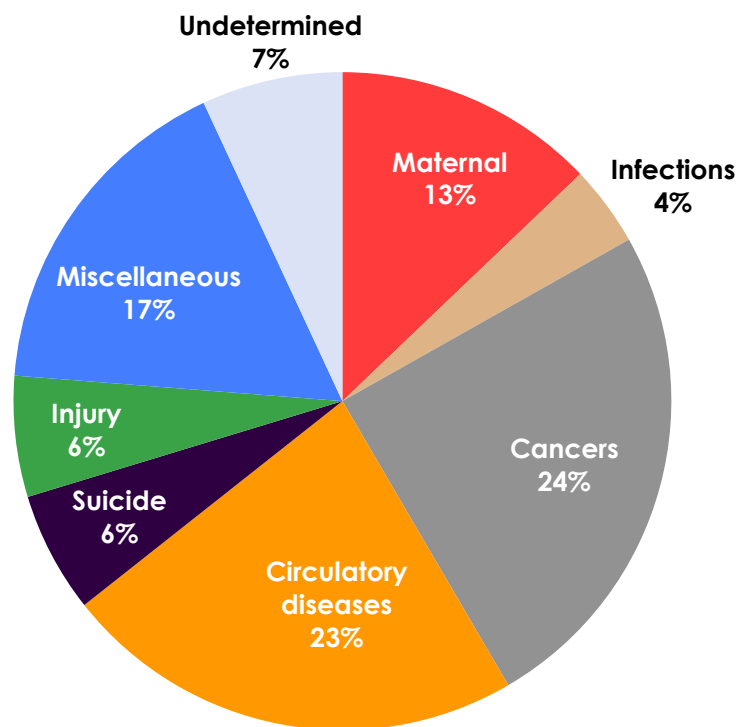


Figure 3.12. Percentage distribution of cause of death among women of reproductive age (15–49 years), Bangladesh, 2016



- Age-specific female mortality rate (per 100,000) increase with age.
- There are no differences in these mortality ratios between BMMS 2010 and BMMS 2016, although the ratios in 2010 and 2016 are substantially lower than the ratio in 2001 at all ages.

Table 3.5. Cause-specific mortality rates for the three years before the survey, by age, Bangladesh, 2016.

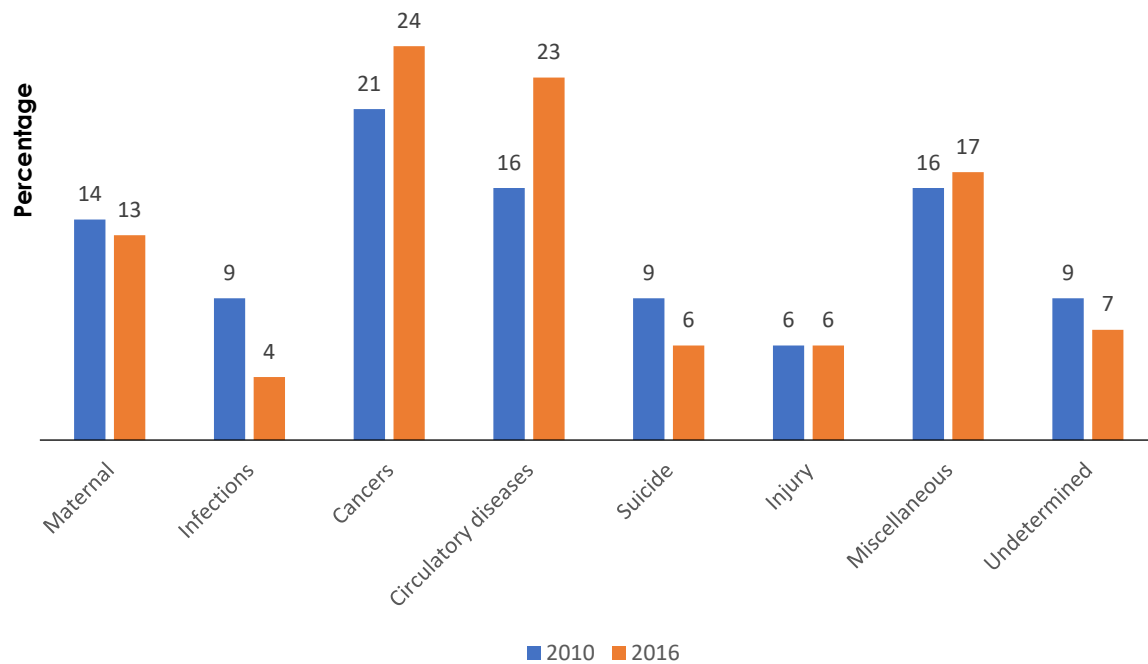
Age	Exposure time (women-years)	Maternal ¹	Infections ¹	Cancers ¹	Circulatory disease ¹	Suicide ¹	Other violent causes ¹	Miscellaneous causes ¹	Not classified ¹	Total ¹
15–19	221,051.023	0.145	0.037	0.063	0.061	0.124	0.058	0.132	0.067	0.686
20–24	190,825.590	0.201	0.026	0.055	0.109	0.070	0.059	0.100	0.018	0.639
25–29	176,606.936	0.192	0.048	0.129	0.082	0.069	0.079	0.154	0.095	0.848
30–34	150,600.872	0.230	0.026	0.278	0.177	0.025	0.032	0.176	0.082	1.025
35–39	123,488.496	0.162	0.069	0.362	0.404	0.074	0.062	0.220	0.040	1.392
40–44	110,372.538	0.026	0.082	0.617	0.504	0.045	0.082	0.288	0.075	1.719
45–49	86,298.287	0.017	0.053	1.223	1.190	0.035	0.135	0.629	0.256	3.537
Total	1,059,243.740	0.154	0.045	0.290	0.268	0.070	0.067	0.203	0.078	1.175

Note: Considers de jure female household population in exposure and gets cause-specific deaths from the verbal autopsy questionnaire

¹Deaths per 1,000 woman-years of exposure

- Cancers (24%) and circulatory diseases (23%) are the major causes of adult female deaths in Bangladesh, particularly among women ages 35 years and above.
- Around 13% of all adult female deaths (15–49 years) are due to maternal causes. Maternal deaths are most common among women ages 20–34 years.
- Injuries, infections, and suicide each account for less than 10% of adult female deaths. Suicide is the second most common cause of adult female deaths among women ages 15–19 years after maternal deaths.

Figure 3.13. Percentage distribution of cause of death among women of reproductive age (15–49 years): Comparison between BMMS 2010 and BMMS 2016



- The proportionate contributions of cancers and circulatory diseases among all adult female deaths are higher in BMMS 2016 compared to BMMS 2010.
- The proportionate contribution of maternal causes of deaths among all adult female deaths has largely remained unchanged.
- The proportionate contribution of infections and suicide are marginally lower in BMMS 2016 from the BMMS 2010 estimates.

SECTION 4: ANTENATAL CARE

SUMMARY

- Almost three in every four (74 percent) women received at least one antenatal care (ANC) visit from a medically trained provider. An additional nine percent of women received ANC from nonmedically trained providers only.
- In the past six years, the uptake of ANC from medically trained providers increased rapidly, by more than three percentage points per year.
- Thirty-seven percent of women received the recommended number of (4 or more) antenatal checkups during pregnancy. In 2010, 23 percent had received four or more ANC checkups.
- The private sector is now the most prominent source of ANC, both in urban and rural areas. Overall, 58 percent of ANC seekers went to the private sector to receive checkups, while 36 percent used the public sector. The prominence of the public sector as a source of ANC has declined between BMMS 2010 and 2016.
- A notable proportion of pregnant women (22 percent) were receiving ANC at home.
- Most women who received ANC were weighed (88 percent) and had their blood pressure measured (91 percent) during pregnancy. Four out of five pregnant women who had ANC had received an ultrasound. In comparison, women were less likely to have a blood test (63 percent) or urine test (68 percent) done during ANC.
- The percentage of women who had blood or urine tests done during ANC increased notably between BMMS 2010 and BMMS 2016, from 37 to 63 percent for blood test and from 50 to 68 percent for urine test.
- Antenatal care service use has become more equitable. In 2001, the richest women were 3.4 times more likely than the poorest to receive ANC from a medically trained provider; in 2016, this ratio has declined to 1.8.

Table 4.1. Antenatal care

Percentage distribution of women ages 15–49 who had a live birth in the three years preceding the survey, by ANC provider during pregnancy, for the most recent birth, and the percentage receiving antenatal care (ANC) from a medically trained provider, for the most recent birth, according to background characteristics, Bangladesh 2016												
Background characteristics	Medically trained provider						Percentage receiving:					
	Qualified doctor	Nurse/ midwife/ paramedic/ FWV	CSBA	MA/ SACMO	Community health worker ¹	Other	No one	Missing	Total	Any ANC	ANC from medically trained provider	Number of women
Mother's age at birth												
Below 15	56.9	11.0	0.0	0.0	14.2	0.5	17.3	0.0	100.0	82.7	68.0	182
15–19	69.8	5.8	0.2	0.2	8.8	0.7	14.3	0.1	100.0	85.6	76.0	7,307
20–24	69.9	5.2	0.2	0.2	7.7	0.4	16.4	0.1	100.0	83.5	75.5	9,080
25–29	68.6	5.4	0.2	0.2	8.0	0.7	16.8	0.2	100.0	83.1	74.3	6,503
30–34	66.9	4.1	0.4	0.1	9.1	0.7	18.6	0.1	100.0	81.4	71.6	3,043
35–39	61.8	3.0	0.2	0.0	8.3	0.6	25.8	0.2	100.0	74.0	65.0	840
40–44	45.4	5.1	0.0	0.0	11.4	0.0	38.1	0.0	100.0	61.9	50.5	163
45–49	*	*	*	*	*	*	*	*	*	*	*	14
Residence												
Urban	76.3	5.4	0.3	0.1	6.8	0.6	10.4	0.2	100.0	89.5	82.1	7,188
Rural	66.0	5.2	0.2	0.2	8.8	0.6	18.8	0.1	100.0	81.1	71.6	19,945
Division												
Barisal	58.8	4.5	0.1	0.3	8.8	0.4	27.2	0.0	100.0	72.8	63.7	1,525
Chittagong	70.5	7.2	0.3	0.2	4.2	0.9	16.6	0.1	100.0	83.3	78.2	6,261
Dhaka	73.6	4.4	0.1	0.1	7.8	0.7	13.0	0.2	100.0	86.9	78.3	6,862
Khulna	79.6	3.2	0.1	0.3	6.3	0.2	10.3	0.0	100.0	89.7	83.2	2,546
Mymensingh	55.7	4.4	0.4	0.1	14.9	0.9	23.5	0.1	100.0	76.4	60.7	2,273
Rajshahi	70.6	4.2	0.2	0.2	7.7	0.2	16.9	0.0	100.0	83.1	75.2	2,899
Rangpur	63.6	6.9	0.4	0.1	14.7	0.3	14.0	0.0	100.0	86.0	71.1	2,778
Sylhet	59.2	5.4	0.2	0.1	9.3	1.1	24.5	0.2	100.0	75.3	64.9	1,990

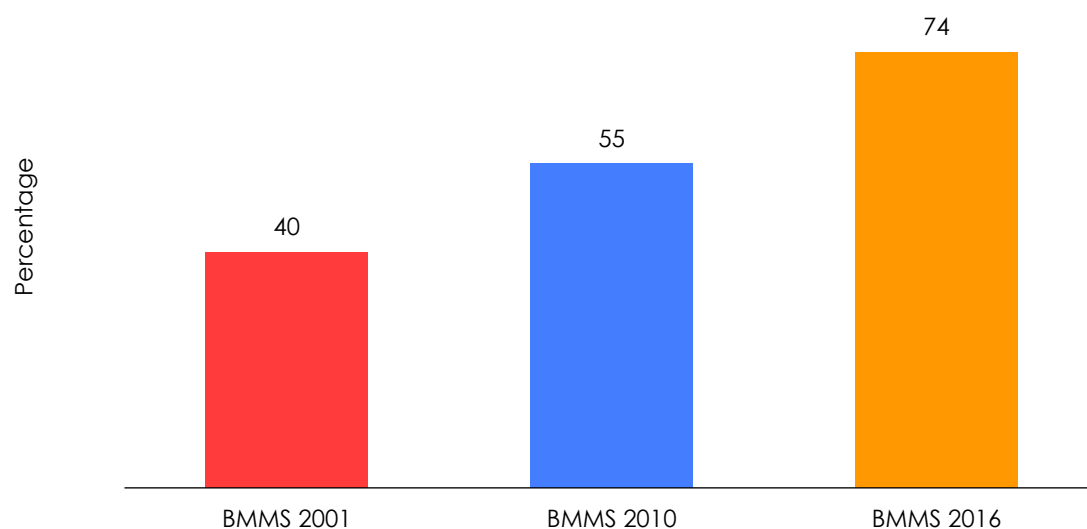
Percentage distribution of women ages 15–49 who had a live birth in the three years preceding the survey, by ANC provider during pregnancy, for the most recent birth, and the percentage receiving antenatal care (ANC) from a medically trained provider, for the most recent birth, according to background characteristics, Bangladesh 2016

Background characteristics	Medically trained provider								Total	Percentage receiving:		
	Qualified doctor	Nurse/ midwife/ paramedic/ FWV	CSBA	MA/ SACMO	Community health worker ¹	Other	No one	Missing		Any ANC	ANC from medically trained provider	Number of women
Mother's education												
No education	41.8	6.3	0.1	0.1	13.1	0.8	37.5	0.3	100.0	62.2	48.3	2,293
Primary incomplete	52.5	6.7	0.2	0.4	12.5	0.8	26.6	0.2	100.0	73.2	59.8	4,195
Primary complete	58.3	6.9	0.5	0.1	11.2	1.0	22.0	0.1	100.0	77.9	65.7	4,103
Secondary incomplete	73.8	5.0	0.3	0.2	7.2	0.5	13.0	0.1	100.0	86.9	79.2	11,064
Secondary complete/ higher	89.9	3.1	0.1	0.1	3.1	0.3	3.5	0.0	100.0	96.5	93.2	5,478
Wealth quintile												
Lowest	43.4	7.3	0.5	0.2	14.2	1.1	33.3	0.1	100.0	66.6	51.3	5,451
Second	60.0	5.9	0.3	0.2	10.5	0.6	22.3	0.1	100.0	77.6	66.4	5,513
Middle	72.8	5.1	0.2	0.1	7.3	0.4	13.9	0.1	100.0	86.0	78.3	5,350
Fourth	78.2	4.7	0.2	0.2	6.1	0.7	9.9	0.1	100.0	90.0	83.2	5,592
Highest	90.1	3.1	0.1	0.1	3.2	0.2	3.1	0.1	100.0	96.8	93.4	5,227
Total	68.7	5.3	0.2	0.2	8.3	0.6	16.6	0.1	100.0	83.3	74.4	27,133

Note: If more than one source of ANC was mentioned, only the provider with the highest qualification is considered in the tabulation.

¹Included community health care provider, health assistant (HA), family welfare assistance (FWA), and nongovernmental organization (NGO) health providers
FWV=family welfare visitor; CSBA = community skilled birth attendant; MA = medical assistant; SACMO = sub-assistant community medical officer.

Figure 4.1. Trends in ANC from a medically trained provider, BMMS 2001, 2010, and 2016



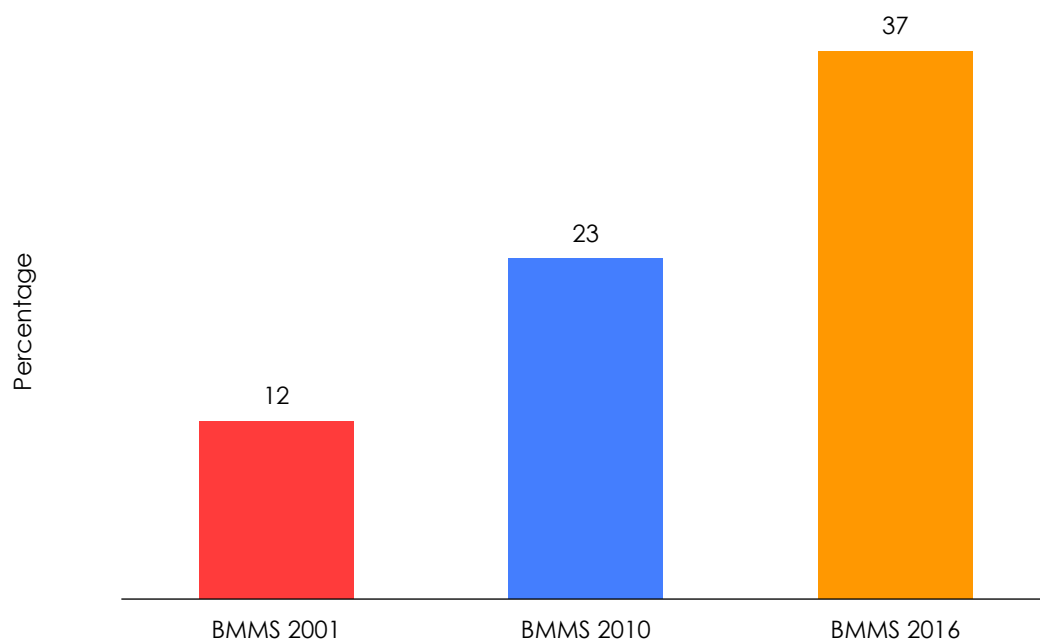
- Three out of four women sought ANC from a medically trained provider in 2016 (Figure 4.1).
- Women in the age group 15–24 are most likely to seek ANC from a medically trained provider (Table 4.1).
- The likelihood of receiving ANC from a medically trained provider was positively associated with women’s education and household wealth.
- A higher proportion of urban women (82 percent) sought ANC from a medically trained provider than their rural counterparts (72 percent).
- In the past six years, ANC from a medically trained provider increased by 3.1 percentage points per year. In comparison, between BMMS 2001 and BMMS 2010, the increase in ANC from a medically trained provider was slower, at 1.7 percentage points per year (Figure 4.1).

Table 4.2. Number of antenatal care visits and timing of first visit

Percentage distribution of women ages 15–49 who had a live birth in the three years preceding the survey by number of antenatal care visits for the most recent live birth and by the timing of first visit, according to residence, Bangladesh 2016			
Number and timing of ANC visits	Residence		Total
	Urban	Rural	
Number of ANC visits			
None	10.4	18.8	16.6
1	10.3	14.6	13.5
2	14.1	17.9	16.9
3	16.2	15.5	15.7
4+	48.8	33.1	37.2
Don't know/missing	0.1	0.1	0.1
Total	100.0	100.0	100.0
Median number of visits (for those with ANC)	3.8	3.0	3.3
Number of women	7,188	19,945	27,133
Number of months pregnant at time of first ANC visit			
No antenatal care	10.4	18.8	16.6
<4	39.4	25.9	29.4
4–5	28.7	26.2	26.8
6–7	15.2	20.1	18.8
8+	5.9	8.9	8.1
Don't know/missing	0.4	0.1	0.2
Total	100.0	100.0	100.0
Median months pregnant at first visit (for those with ANC)	3.9	4.7	4.5
Number of women with ANC ¹	6,435	16,182	22,617

¹ Includes those with missing response about ANC provider

Figure 4.2. Trends in women who receive four or more antenatal care visits, BMMS 2001, 2010, and 2016



- Thirty-seven percent of women are receiving the recommended four or more ANC visits during pregnancy.
- Almost half of urban women surveyed received at least four ANC visits, compared to one-third of rural women.
- In urban areas, women received their first ANC a bit earlier (3.9 months) than their rural counterparts (4.7 months).
- The percentage of women receiving four or more ANC increased by 14 percentage points in the past six years (Figure 4.2).

Table 4.3. Place of antenatal care

Among women ages 15-49 who had a live birth in the three years preceding the survey, the percentage who received antenatal care (ANC) during the pregnancy associated with the most recent birth, by place of ANC, according to background characteristics, Bangladesh 2016						
Background characteristics	Place of antenatal care ¹					Number of women (who received ANC)
	Home	Public sector	Private sector	NGO sector	Other	
Mother's age at birth						
Below 15	24.5	43.7	41.6	12.7	1.2	151
15-19	24.3	37.1	56.7	10.5	0.7	6,254
20-24	20.4	37.0	58.2	10.6	0.6	7,585
25-29	21.5	35.1	58.9	9.5	0.6	5,402
30-34	20.2	34.8	57.4	10.4	0.4	2,477
35-39	21.7	33.9	58.7	9.2	0.3	621
40-44	28.2	42.6	46.9	4.7	0.0	101
45-49	*	*	*	*	*	11
Birth order						
1	21.0	36.7	60.2	10.7	0.7	9,283
2-3	21.8	35.9	57.3	10.1	0.6	11,094
4-5	25.1	36.4	50.8	8.8	0.5	1,941
6+	26.2	41.5	40.1	9.8	0.6	284
Residence						
Urban	15.0	33.2	54.3	19.2	0.8	6,430
Rural	24.5	37.6	59.1	6.7	0.5	16,173
Division						
Barisal	19.4	45.0	48.6	5.4	0.1	1,111
Chittagong	11.7	28.4	64.9	10.5	1.0	5,214
Dhaka	12.9	31.2	60.6	13.0	0.7	5,961
Khulna	26.7	43.7	59.3	10.1	0.0	2,284
Mymensingh	38.5	38.1	49.9	8.1	0.3	1,737
Rajshahi	26.4	41.1	58.4	6.1	0.1	2,409
Rangpur	50.4	48.0	45.6	12.1	0.4	2,389
Sylhet	14.5	38.4	52.6	8.6	1.5	1,497
Mother's education						
No Education	28.7	36.8	40.5	14.7	1.2	1,427
Primary incomplete	27.1	41.7	44.2	11.4	0.5	3,071
Primary complete	24.7	39.2	49.1	11.1	1.0	3,197
Secondary incomplete	22.3	36.1	60.3	9.7	0.5	9,619
Secondary complete/higher	14.4	31.7	70.7	8.9	0.4	5,289
Wealth quintile						
Lowest	32.2	45.4	40.7	6.9	0.6	3,630
Second	30.8	41.5	52.2	8.4	0.4	4,277
Middle	23.4	39.1	59.0	8.3	0.7	4,602
Fourth	17.6	33.2	61.4	13.2	0.5	5,032
Highest	9.6	26.1	69.8	13.2	0.8	5,062
Total	21.8	36.3	57.7	10.3	0.6	22,603

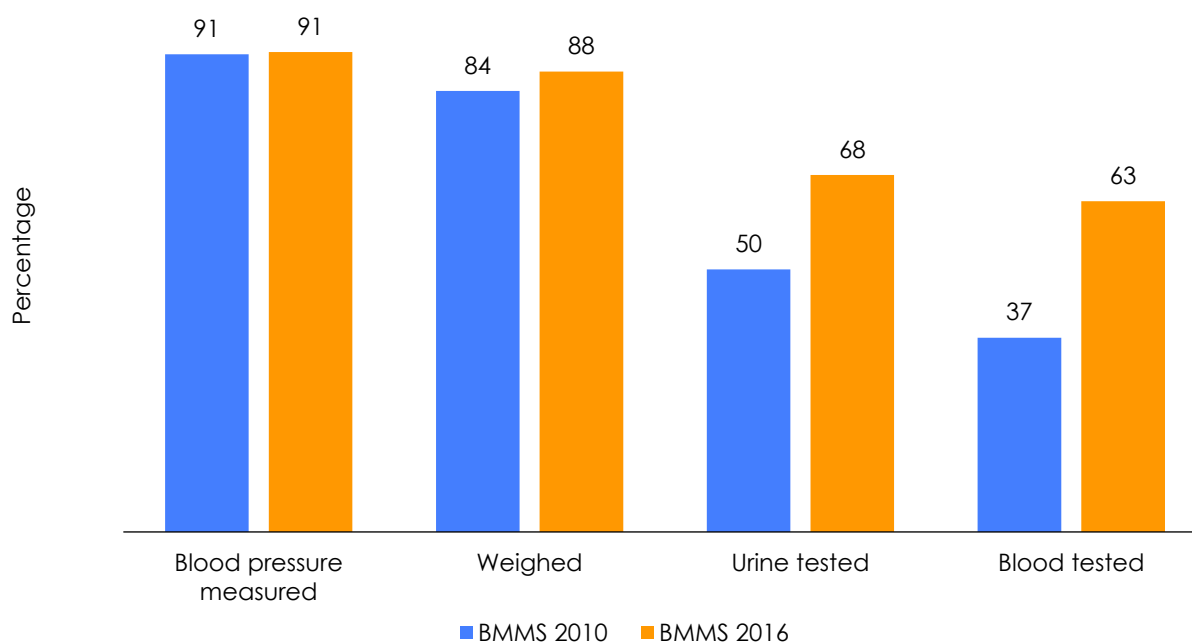
¹ Multiple responses possible

- The private sector is the most prominent source of ANC, both in urban and rural areas. Overall, almost three out of five women sought ANC from the private health sector (Table 4.3). Six years ago, the public sector was the most prominent source of ANC for rural women, and the private sector for urban women.
- Twenty-two percent of women received ANC at home; women in Rangpur Division are most likely to receive ANC at home (50 percent). The percentage of women who received ANC at home increased slightly since 2010.

Table 4.4. Components of antenatal care

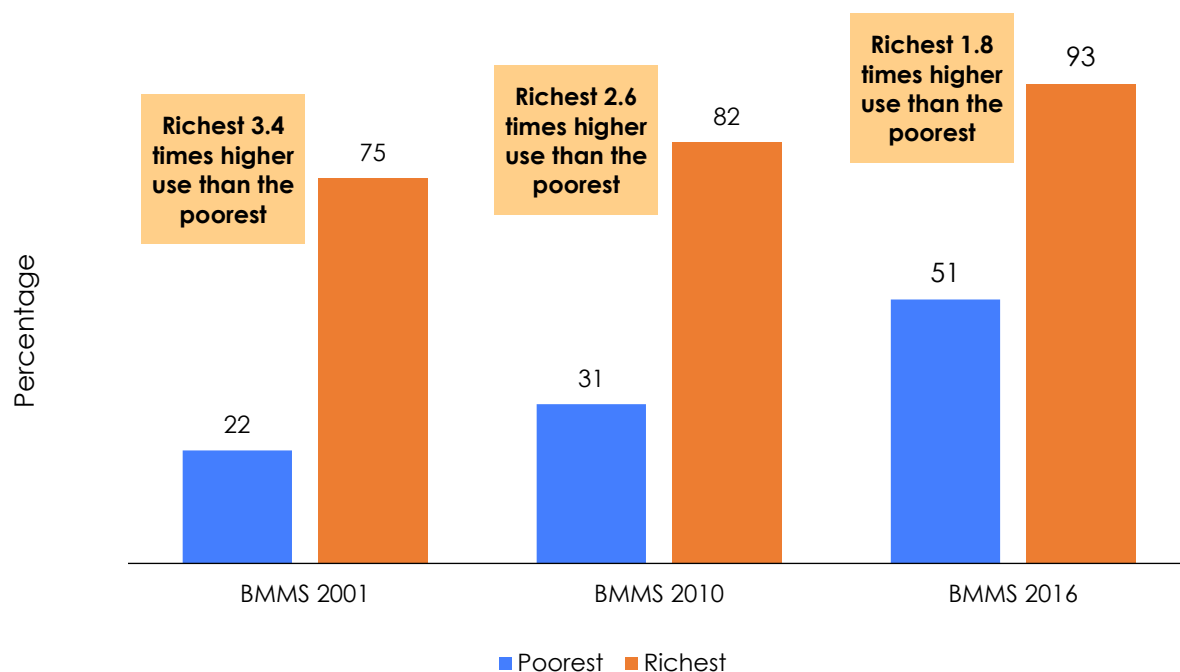
Percentage of women ages 15–49 with a live birth in the three years preceding the survey, who received specific antenatal care services for the most recent birth, according to background characteristics, Bangladesh 2016						
Background characteristics	Procedure performed during antenatal care					Number of women (who received ANC)
	Blood pressure measured	Urine tested	Blood test done	Weighed	Ultrasound	
Mother's age at birth						
Below 15	86.0	59.1	47.6	81.8	65.9	151
15–19	90.1	67.1	62.4	87.1	80.1	6,254
20–24	91.8	68.5	63.4	88.1	80.4	7,585
25–29	92.4	68.7	63.8	88.1	81.3	5,402
30–34	91.8	68.8	62.9	86.8	79.2	2,477
35–39	91.9	65.5	62.2	88.8	78.3	621
40–44	90.1	61.2	53.3	86.6	69.3	101
45–49	*	*	*	*	*	11
Birth order						
1	92.2	72.0	68.3	89.6	84.4	9,283
2–3	91.5	67.1	61.5	87.3	79.3	11,094
4–5	87.9	57.0	48.9	81.6	67.7	1,941
6+	87.6	51.5	40.3	81.3	62.3	284
Residence						
Urban	94.0	74.9	71.5	90.4	84.7	6,430
Rural	90.4	65.2	59.6	86.6	78.4	16,173
Division						
Barisal	93.5	68.1	64.3	89.2	74.8	1,111
Chittagong	90.3	71.6	65.9	87.3	79.6	5,214
Dhaka	90.3	71.4	68.6	87.1	87.5	5,961
Khulna	92.5	66.6	64.0	91.4	85.9	2,284
Mymensingh	93.7	61.1	52.7	83.8	70.4	1,737
Rajshahi	87.6	59.1	55.3	87.3	84.3	2,409
Rangpur	96.5	62.5	55.4	89.6	69.0	2,389
Sylhet	92.0	75.1	64.3	86.2	71.1	1,497
Mother's education						
No education	87.8	53.3	44.5	78.5	62.1	1,427
Primary incomplete	88.0	55.3	48.3	81.7	65.6	3,071
Primary complete	88.5	60.4	52.8	84.0	73.0	3,197
Secondary incomplete	91.2	68.1	63.1	88.3	82.8	9,619
Secondary complete/higher	96.4	83.8	82.4	94.7	93.2	5,289
Wealth quintile						
Lowest	89.1	52.5	43.3	81.0	57.6	3,630
Second	89.0	57.9	51.3	84.4	73.4	4,277
Middle	89.8	66.3	61.2	87.0	81.4	4,602
Fourth	92.2	72.0	68.1	89.2	87.0	5,032
Highest	95.8	85.2	83.5	94.2	94.2	5,062
Total	91.4	68.0	63.0	87.7	80.2	22,603

Figure 4.3. Trends in components of ANC, BMMS 2010 and 2016



- Most women (88 percent) were weighed and had blood pressure measured (91 percent) during pregnancy (Table 4.4).
- Eight out of ten women reported having ultrasound done during pregnancy (Table 4.4).
- Interestingly, urine or blood testing were less likely to be done during pregnancy than ultrasound. However, between BMMS 2010 and 2016, the percentage of women who had a urine or blood test increased considerably, from 50 to 68 percent for urine tests and 37 to 63 percent for blood tests (Figure 4.3).

Figure 4.4. Trends in ANC from a medically trained provider, by wealth quintile, BMMS 2001, 2010, and 2016



- The poor-rich inequity (measured by the ratio of ANC use among women in the poorest wealth quintile households to ANC use among women in the richest wealth quintile households) has been declining.
- In 2001, the richest women were 3.4 times more likely to receive ANC from a medically trained provider than the poorest; in 2016 the richest were 1.8 times more likely than the poorest to receive ANC. The absolute gap in ANC use between the richest and the poorest has also reduced between 2010 and 2016 (Figure 4.4).

SECTION 5: DELIVERY CARE

SUMMARY

- Bangladesh achieved the HPNSDP target of 50 percent of births attended by a medically trained provider by 2016.
- Delivery by trained providers increased from 27 percent in BMMS 2010 to 50 percent in BMMS 2016; the increase was predominantly caused by the rise in facility deliveries from 23 percent to 47 percent.
- Facility deliveries increased at a rate of four percentage points per year between 2010 and 2016 surveys. The increase in facility delivery was much slower (1.6 percentage points per year) between BMMS 2001 and BMMS 2010.
- Private health facilities account for 29 percent of all deliveries, while 14 percent and four percent of births now occur at government and NGO facilities, respectively. In 2010, the private and public health facilities accounted for similar percentages of deliveries, with 11 percent at private and 10 percent at public facilities. In 2016, deliveries at private facilities were more than two times higher than deliveries at public sector health facilities (29 percent versus 14 percent).
- Deliveries by Cesarean section (C-section) increased from 12 percent to 31 percent in the past six years.
- Thirty-one percent of all births are through C-section. Eighty-three percent of births in private facilities are by C-section. The proportion of births in government and NGO facilities that are by C-section is much lower: 35 percent in government and 39 percent in NGO facilities.
- The poor-rich inequity in use of facilities for delivery has declined; yet women in the richest quintile are 3.4 times more likely to deliver in a facility, compared to women in the poorest quintile. The absolute percentage difference in use of facility for delivery between the poorest and richest women is very large—54 percentage points.
- Birth planning among women who gave birth has improved between BMMS 2010 and BMMS 2016. Prearrangement of money for emergency by households increased from 35 percent in 2010 to 54 percent in 2016, while prearrangement of transport for emergency doubled from 10 percent in 2010 to 21 percent in 2016.

Table 5.1. Place of delivery

Background characteristics	Health facility					Total	Percentage delivered in a health facility ¹	Number of births
	Public	Private	NGO	Home	Other/missing			
Mother's age at birth								
Below 15	18.0	19.0	1.1	61.7	0.2	100.0	38.1	202
15-19	15.1	28.6	3.5	52.3	0.4	100.0	47.2	7,821
20-24	14.2	30.2	3.9	51.3	0.4	100.0	48.3	9,561
25-29	13.8	29.6	3.5	52.8	0.3	100.0	46.9	6,772
30-34	13.8	29.1	3.3	53.1	0.6	100.0	46.3	3,144
35-39	11.9	27.5	3.1	56.8	0.8	100.0	42.4	868
40-44	16.8	16.1	3.0	63.6	0.5	100.0	35.9	167
45-49	*	*	*	*	*	*	*	14
Birth order								
1	17.0	36.1	4.3	42.2	0.4	100.0	57.4	11,119
2-3	13.2	27.5	3.4	55.5	0.5	100.0	44.0	14,090
4-5	9.5	14.9	2.4	73.0	0.2	100.0	26.8	2,790
6+	9.9	9.4	2.0	78.5	0.2	100.0	21.3	549
Residence								
Urban	17.8	33.5	8.2	39.9	0.6	100.0	59.5	7,477
Rural	13.0	27.7	2.0	56.9	0.4	100.0	42.7	21,071
Division								
Barisal	11.1	21.0	1.6	66.3	0.0	100.0	33.7	1,598
Chittagong	10.5	27.0	4.1	57.6	0.8	100.0	41.7	6,609
Dhaka	14.4	37.4	5.6	42.1	0.5	100.0	57.4	7,145
Khulna	18.6	40.1	3.0	38.0	0.2	100.0	61.8	2,650
Mymensingh	11.7	18.5	1.5	68.0	0.3	100.0	31.7	2,416
Rajshahi	17.1	31.6	1.9	49.3	0.1	100.0	50.6	3,030
Rangpur	17.7	25.0	3.4	53.6	0.3	100.0	46.1	2,915
Sylhet	16.4	16.2	2.8	63.9	0.6	100.0	35.5	2,186
Mother's education								
No education	9.5	10.6	3.9	75.3	0.6	100.0	24.1	2,447
Primary incomplete	11.8	14.0	3.4	70.4	0.5	100.0	29.2	4,455
Primary complete	12.8	19.0	3.4	64.3	0.4	100.0	35.3	4,350
Secondary incomplete	15.5	31.2	3.2	49.7	0.3	100.0	50.0	11,600
Secondary complete/higher	16.8	53.0	4.4	25.2	0.6	100.0	74.3	5,696
Wealth quintile								
Lowest	9.9	11.2	1.1	77.5	0.3	100.0	22.3	5,830
Second	14.2	20.8	1.6	63.0	0.5	100.0	36.5	5,836
Middle	14.8	29.3	2.7	53.0	0.2	100.0	46.8	5,607
Fourth	16.3	34.6	5.3	43.2	0.5	100.0	56.3	5,852
Highest	16.3	51.8	7.5	23.7	0.7	100.0	75.6	5,423
Total	14.3	29.2	3.6	52.5	0.4	100.0	47.1	28,548

¹ Includes public, private & NGO facility but excludes other

Table 5.2. Assistance during delivery

Percentage distribution of live births in the three years preceding the survey, by person providing assistance during delivery, percentage attended by a medically trained provider, and percentage delivered by C-section, according to background characteristics, Bangladesh 2016														
Background characteristics	Medically trained providers										Total	Percentage delivered by a medically trained provider	Percentage delivered by C-section	Number of births
	Qualified doctor	Nurse/midwife /paramedic/ FWV	CSBA	Trained TBA	Untrained TBA	Relatives/ friends/ neighbors	Other ¹	No one	Missing					
Mother's age at birth														
Below 15	30.8	8.8	0.0	21.1	36.3	2.3	0.7	0.0	0.0	100.0	39.6	21.6	202	
15–19	38.6	11.3	0.3	14.0	32.4	2.9	0.5	0.0	0.1	100.0	50.2	29.2	7,821	
20–24	40.0	10.5	0.3	13.9	31.3	3.5	0.4	0.0	0.1	100.0	50.8	31.8	9,561	
25–29	39.5	9.7	0.4	13.4	33.0	3.4	0.5	0.1	0.1	100.0	49.6	31.7	6,772	
30–34	38.0	10.7	0.2	12.6	34.6	3.1	0.4	0.1	0.2	100.0	49.0	31.0	3,144	
35–39	34.9	10.3	0.1	14.0	36.0	3.8	0.4	0.2	0.3	100.0	45.3	28.5	868	
40–44	27.3	9.0	0.6	16.7	41.2	4.2	0.1	0.9	0.0	100.0	36.8	20.5	167	
45–49	*	*	*	*	*	*	*	*	*	*	*	*	14	
Residence														
Urban	49.0	13.4	0.2	11.3	22.9	2.3	0.6	0.0	0.1	100.0	62.6	38.6	7,477	
Rural	35.4	9.5	0.4	14.6	36.0	3.6	0.4	0.1	0.1	100.0	45.3	27.9	21,071	
Division														
Barisal	28.1	10.4	0.1	16.9	40.0	4.0	0.4	0.0	0.0	100.0	38.6	21.6	1,598	
Chittagong	34.4	11.6	0.3	13.2	38.1	1.8	0.4	0.0	0.1	100.0	46.3	25.9	6,609	
Dhaka	49.6	9.0	0.2	12.0	25.5	2.8	0.5	0.0	0.2	100.0	58.9	41.2	7,145	
Khulna	51.9	11.9	0.2	11.7	21.6	2.3	0.3	0.0	0.0	100.0	64.0	42.7	2,650	
Mymensingh	23.5	10.2	0.6	17.0	43.5	4.4	0.6	0.1	0.1	100.0	34.3	20.0	2,416	
Rajshahi	41.9	10.1	0.3	10.8	32.3	4.1	0.3	0.2	0.0	100.0	52.3	32.4	3,030	
Rangpur	35.6	11.8	0.7	19.2	25.0	7.2	0.5	0.0	0.0	100.0	48.0	26.4	2,915	
Sylhet	27.9	9.7	0.5	13.9	45.0	2.1	0.5	0.1	0.4	100.0	38.1	18.6	2,186	

Percentage distribution of live births in the three years preceding the survey, by person providing assistance during delivery, percentage attended by a medically trained provider, and percentage delivered by C-section, according to background characteristics, Bangladesh 2016

Background characteristics	Medically trained providers										Total	Percentage delivered by a medically trained provider	Percentage delivered by C-section	Number of births
	Qualified doctor	Nurse/midwife /paramedic/ FWV	CSBA	Trained TBA	Untrained TBA	Relatives/ friends/ neighbors	Other ¹	No one	Missing					
Mother's education														
No Education	16.9	9.0	0.1	14.7	52.8	5.3	0.6	0.2	0.3	100.0	26.1	11.8	2,447	
Primary incomplete	21.4	9.0	0.3	16.7	47.7	4.2	0.5	0.2	0.2	100.0	30.6	15.7	4,455	
Primary complete	27.1	10.2	0.2	16.5	41.5	3.9	0.6	0.0	0.1	100.0	37.4	19.7	4,350	
Secondary incomplete	41.3	11.3	0.4	13.9	29.5	3.2	0.4	0.0	0.1	100.0	52.9	32.0	11,600	
Secondary complete/higher	66.6	11.1	0.4	8.6	11.6	1.4	0.1	0.0	0.1	100.0	78.2	56.4	5,696	
Wealth quintile														
Lowest	16.4	7.7	0.5	17.3	53.1	4.6	0.3	0.1	0.1	100.0	24.6	11.5	5,830	
Second	28.3	10.6	0.4	15.6	40.0	4.5	0.6	0.1	0.1	100.0	39.2	21.3	5,836	
Middle	38.0	11.1	0.3	14.8	31.9	3.4	0.4	0.1	0.1	100.0	49.5	29.6	5,607	
Fourth	46.7	12.5	0.3	12.7	24.5	2.5	0.5	0.1	0.2	100.0	59.5	36.9	5,852	
Highest	67.4	10.7	0.2	7.9	12.0	1.3	0.4	0.0	0.1	100.0	78.3	56.0	5,423	
Total	39.0	10.5	0.3	13.7	32.6	3.3	0.4	0.1	0.1	100.0	49.8	30.7	28,548	

Note: If the respondent mentioned more than one person attending during delivery, only the most qualified person is considered in the tabulation.

¹ 'Other' includes MA/SACMO, community health care provider, HA, FWA, NGO workers, unqualified doctor, and 'other.'

Figure 5.1. Trends in deliveries by medically trained provider, 2001–2016

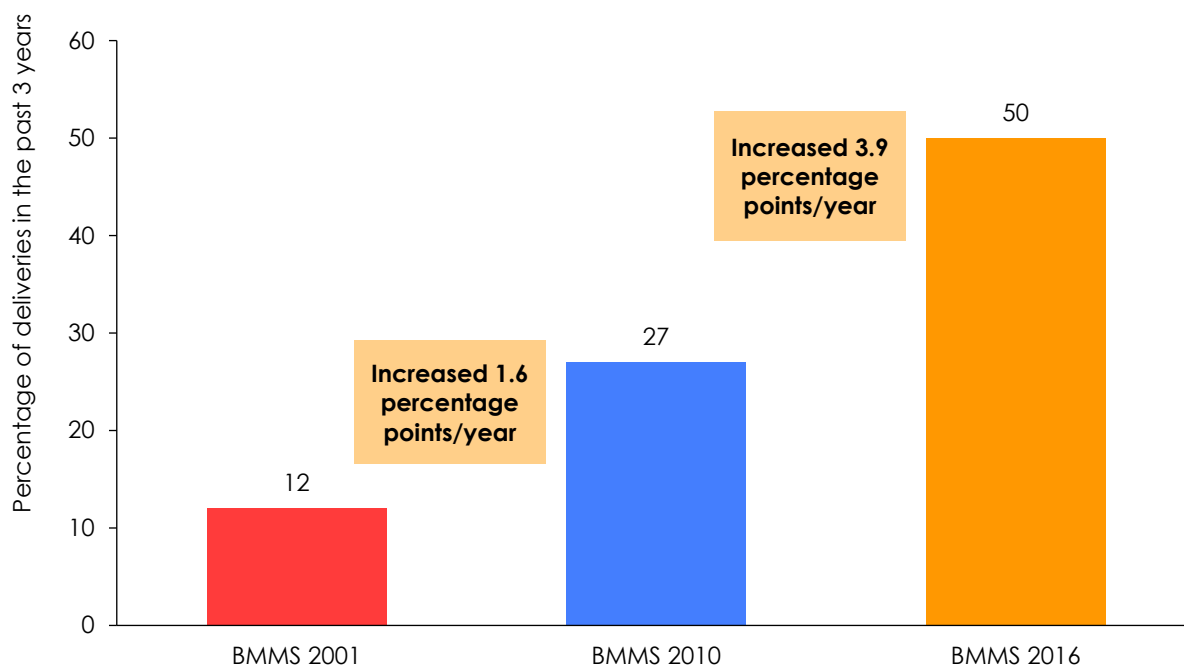


Figure 5.2. Trends in births delivered in a health facility 2001–2016

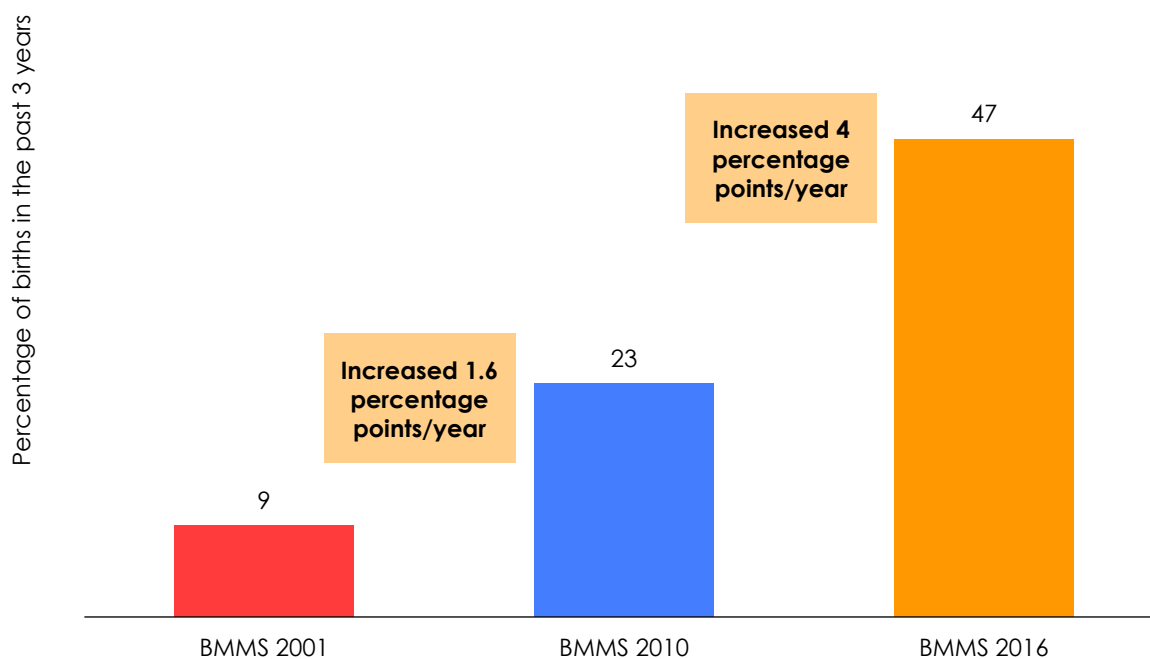


Figure 5.3. Change in facility deliveries by type of facility

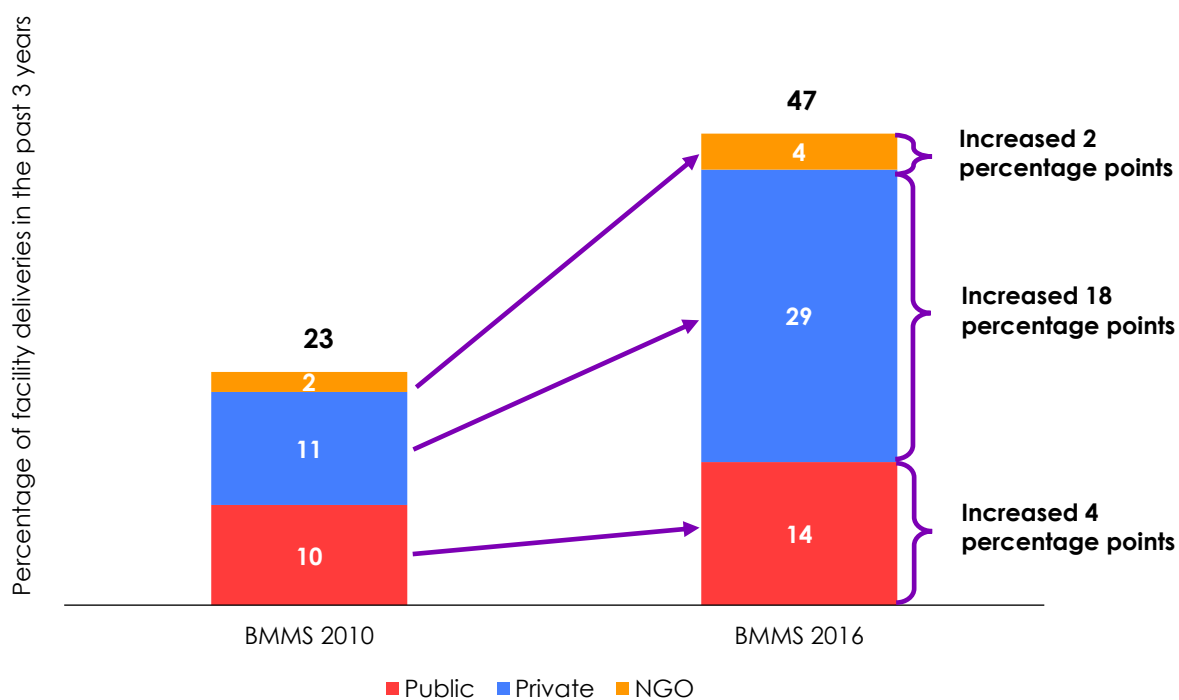
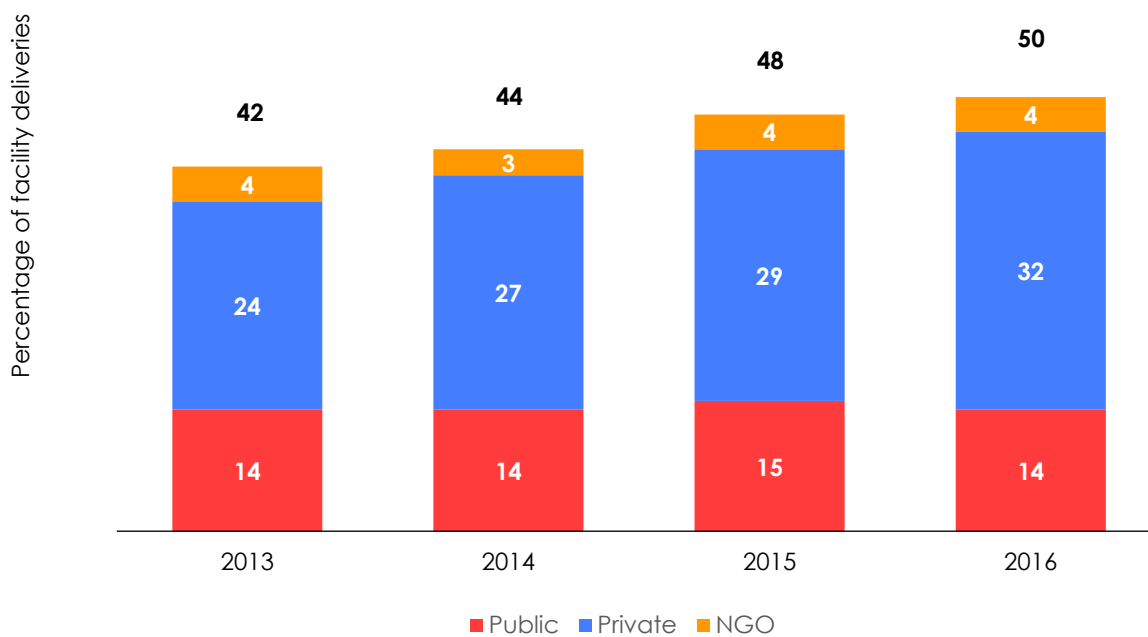


Figure 5.4. Trends in facility delivery in the past 4 years



- Delivery by medically trained providers in Bangladesh has reached 50 percent (Table 5.2).
- Births attended by medically trained provider were more common among women in urban areas (63 percent), women who have completed secondary or higher education (78 percent), or women in the highest wealth quintile (78 percent). Women of Khulna Division (64 percent) had the highest proportion of births assisted by medically trained providers, while the proportion was the lowest in Mymensingh Division (34 percent).
- Medically assisted births increased more rapidly in recent years—an average increase of about 4 percentage points per year between BMMS 2010 and BMMS 2016, compared to only 1.6 percentage points per year between BMMS 2001 and BMMS 2010 (Figure 5.1).
- Forty-seven percent of the births occurred at health facilities, mostly (29 percent) in private facilities (Table 5.1).
- Facility delivery was more common among the first order births (57 percent), in urban areas (60 percent), or in Khulna Division (62 percent). Mothers' educational level and household wealth quintile are positively associated with facility delivery.
- The percentage of deliveries at health facilities doubled in the past six years, increasing from 23 percent to 47 percent (Figure 5.2).
- The private sector accounts for most of the increase in facility delivery in recent years. Between the BMMS 2010 and BMMS 2016, delivery at private health facilities increased from 11 percent to 29 percent (Figure 5.3).
- In 2010, the private and public health facilities accounted for similar percentages of deliveries, 11 percent at public and 10 percent at private facilities. In 2016, deliveries at private facilities were more than two times higher than deliveries at public sector health facilities (29 percent versus 14 percent).

Figure 5.5. Trends in deliveries by C-section, 2001–2016

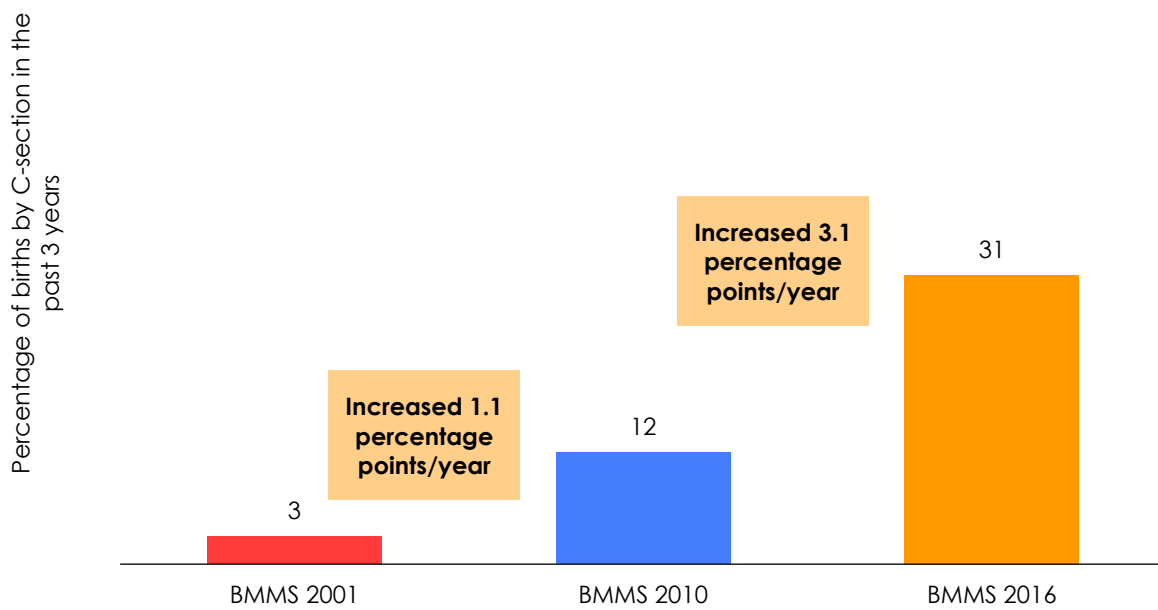
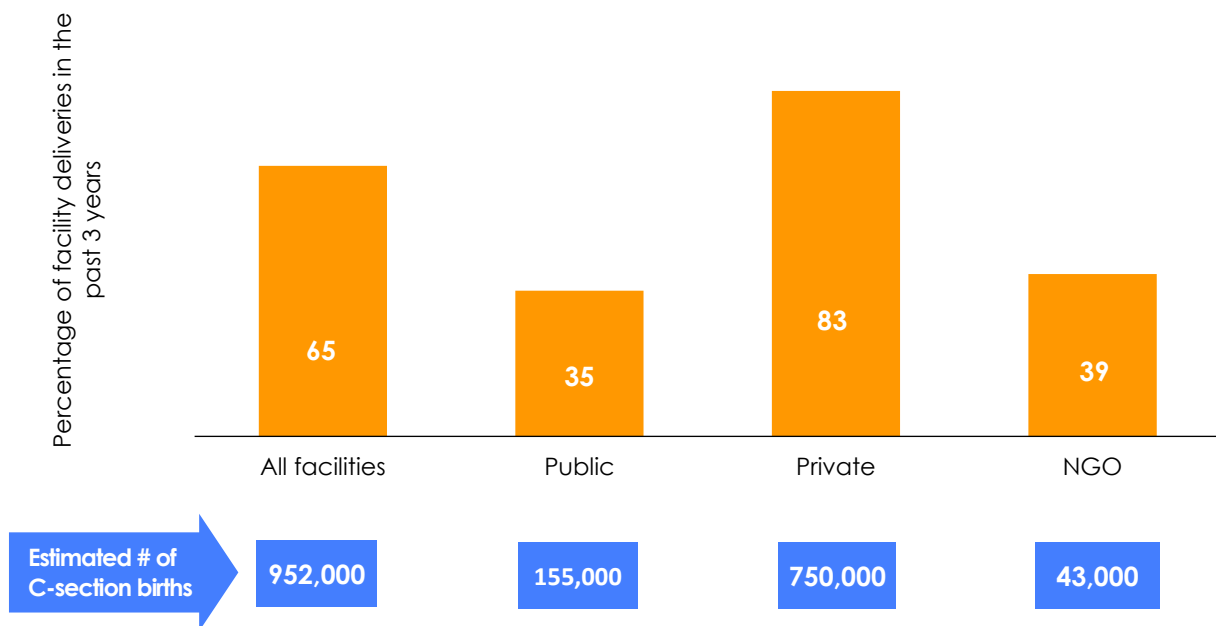
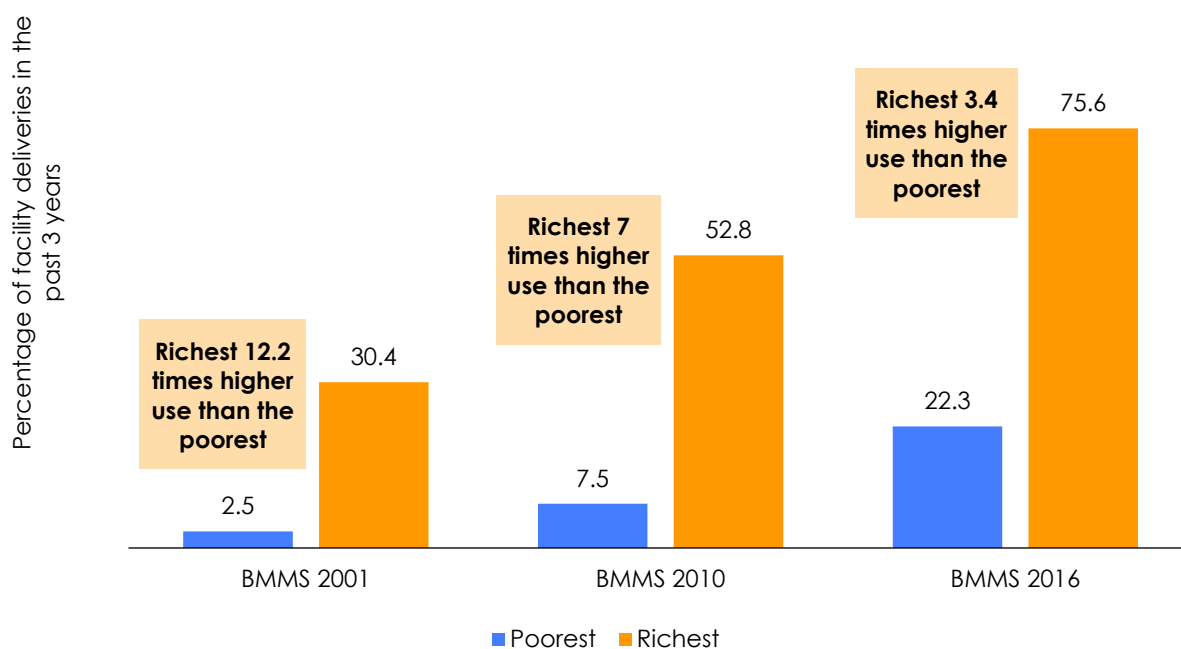


Figure 5.6. Proportion of facility deliveries performed by C-section by type of facility



- Almost one in three deliveries was performed by C-section (Table 5.2).
- Rates of C-section rise with increase in household wealth and women's education. More than half (56%) of the women in the richest households, and those who have at least completed secondary education, delivered by C-section. Rates of C-section were higher in urban than rural areas. Among the eight divisions, C-section rates were the highest in Dhaka and Khulna Divisions, at 41% and 43%, respectively.
- Deliveries performed by C-section increased steeply in the past 6 years, from 12 percent to 31 percent. This translates into 3.1 percentage points increase per year between BMMS 2010 and BMMS 2016. In comparison, C-section rate increase was slower, at 1.1 percentage point per year between 2001 and 2010 (Figure 5.5).
- Two in three facility deliveries were performed by C-section (Figure 5.6).
- The private sector contributed the largest share of C-sections. More than four in five deliveries (83 percent) performed in private hospitals and clinics were by C-section.
- Of the 3.1 million annual births in Bangladesh, 952,000 are conducted by C-section, of which private hospitals and clinics performed 750,000 each year.

Figure 5.7. Poor-rich inequity in use of health facilities for delivery, 2001–2016

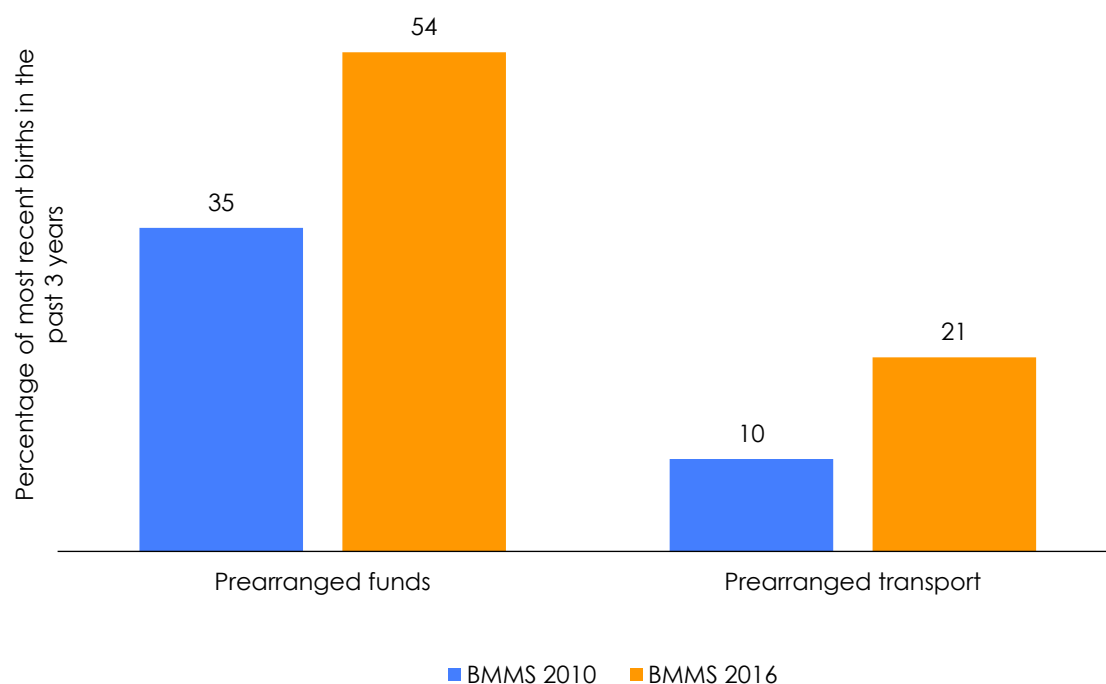


- The poor-rich inequity in use of health facilities for child delivery continues to decline. Bangladesh has successfully achieved the HPNSDP target of narrowing the gap between the poorest and the richest in using facility delivery to less than 1 to 4 (Figure 5.7).
- According to BMMS 2016, 22 percent of births by women in the poorest wealth quintile were in a health facility, compared to 76 percent of births in the richest quintile. This translates to a poor-rich ratio of 1 to 3.5. The corresponding ratios in 2001 and 2010 are 1 to 10 and 1 to 6.6, respectively.
- However, the absolute gap in use of health facility for delivery between the poorest and richest household is very large—a difference of 54 percentage points.

Table 5.3. Prearrangements for emergency during pregnancy and delivery

Percentage of women who had prearranged funds, prearranged transport for emergency with delivery or pregnancy for most recent live births in the three years preceding the survey, Bangladesh 2016			
Background characteristics	Had prearranged funds for emergency with delivery or pregnancy	Had prearranged transport for emergency with delivery or pregnancy	Number of women
Mother's age at birth			
Below 15	53.0	18.0	182
15–19	51.2	19.2	7,307
20–24	54.4	20.8	9,080
25–29	56.2	23.1	6,503
30–34	52.5	20.1	3,043
35–39	50.7	18.0	840
40–44	39.4	10.3	163
45–49	*	*	14
Birth order			
1	56.2	23.0	10,398
2–3	54.6	20.9	13,506
4–5	42.5	12.7	2,697
6+	31.7	9.3	532
Residence			
Urban	61.0	23.4	7,188
Rural	50.8	19.7	19,945
Division			
Barisal	47.6	18.5	1,525
Chittagong	51.6	19.5	6,261
Dhaka	59.3	22.0	6,862
Khulna	53.5	22.9	2,546
Mymensingh	53.1	18.2	2,273
Rajshahi	51.8	20.2	2,899
Rangpur	52.7	20.5	2,778
Sylhet	48.4	22.4	1,990
Mother's education			
No education	37.2	9.8	2,293
Primary incomplete	42.5	12.8	4,195
Primary complete	46.3	15.1	4,103
Secondary incomplete	55.2	21.6	11,064
Secondary complete/higher	70.9	33.6	5,478
Wealth quintile			
Lowest	37.9	11.8	5,451
Second	43.3	15.4	5,513
Middle	52.6	20.0	5,350
Fourth	62.0	24.1	5,592
Highest	72.6	32.5	5,227
Total	53.5	20.7	27,133

Figure 5.8. Prearrangements for emergency during pregnancy and delivery, 2010–2016



- Over half of the women who delivered in past three years had prearranged funds to face an emergency related to pregnancy and delivery (Table 5.3).
- Only one in five women who delivered had prearranged transport to meet an emergency need.
- Prearrangement of funds and transport are positively associated with household wealth and women’s education. Urban households were more likely to prearrange funds and transport than rural households. Households in Dhaka Division were more likely to prearrange funds (59 percent), while those in Barisal (47 percent) were least likely to do so. Prearrangement for transport did not vary much by divisions. Prearrangement of funds and transport were both higher for birth order 1–3 than 3+.
- Birth planning improved in the past six years. The proportion of women who reported having prearranged funds for an emergency increased from 35 percent in 2010 to 54 percent in 2016. While the proportion of women with prearranged transport for an emergency doubled from 10 percent in 2010 to 21 percent in 2016 (Figure 5.8).

SECTION 6: POSTNATAL CARE

SUMMARY

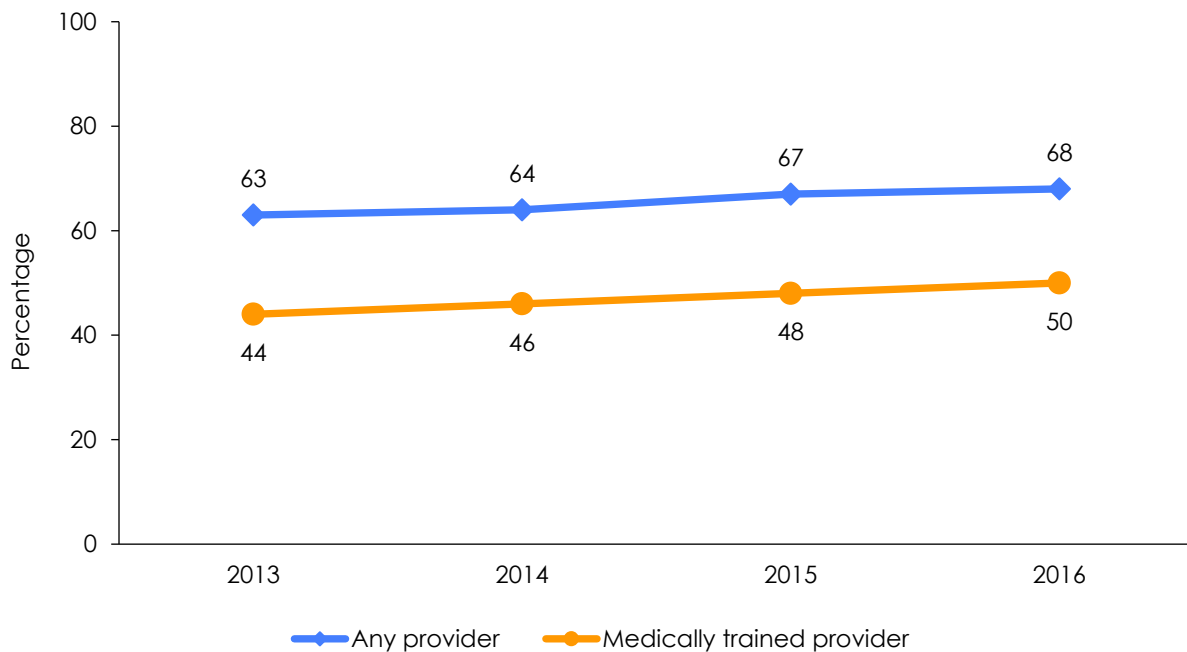
- About half (48 percent) of women who delivered a baby during 2014–2016 received PNC from a medically trained provider within two days of delivery.
- Postnatal care coverage has been increasing sharply; PNC by a medically trained provider has increased from 11 percent in 2001, to 23 percent in 2010, and to 48 percent in 2016. Postnatal care by a nonmedically trained provider also increased from six percent, to 10 percent, and to 18 percent during the same periods.
- Only six percent of women who delivered at home received PNC from a medically trained provider.
- The percentage of women who received the complete maternity care (ANC, delivery care, and PNC within two days, from a medically trained provider) has increased significantly from five percent in BMMS 2001, to 19 percent in BMMS 2010, and to 43 percent in BMMS 2016.

Table 6.1. Timing of first postnatal checkup for the mother

Background characteristics	Timing after delivery of mother's first postnatal checkup						Total	Percentage receiving checkup within 2 days of delivery from any provider	Percentage receiving checkup within 2 days of delivery from a medically trained provider	Number of women
	<4 hours	4–23 hours	Within 1–2 days	Within 2 months ¹	Timing missing	No postnatal checkup				
Mother's age at birth										
Below 15	50.2	5.5	4.5	3.5	0.6	35.6	100.0	60.3	37.9	182
15–19	55.8	6.2	5.0	2.8	0.4	29.8	100.0	67.0	48.6	7,307
20–24	56.2	7.2	3.7	3.2	0.3	29.4	100.0	67.2	49.1	9,080
25–29	53.5	7.1	4.0	3.3	0.3	31.8	100.0	64.6	47.2	6,503
30–34	53.8	6.6	4.5	3.3	0.1	31.7	100.0	64.9	47.5	3,043
35–39	54.3	6.1	3.4	2.6	0.3	33.3	100.0	63.8	43.3	840
40–44	42.0	9.6	3.0	2.3	0.0	43.2	100.0	54.5	35.4	163
45–49	*	*	*	*	*	*	*	*	*	14
Birth order										
1	61.4	7.2	4.2	2.7	0.3	24.1	100.0	72.8	57.9	10,398
2–3	52.8	6.7	4.1	3.2	0.3	32.9	100.0	63.6	45.1	13,506
4–5	43.7	6.5	4.9	3.6	0.1	41.2	100.0	55.0	29.0	2,697
6+	42.7	4.5	4.7	3.5	0.2	44.4	100.0	51.9	21.6	532
Residence										
Urban	61.3	8.6	5.0	3.0	0.3	21.8	100.0	74.8	59.1	7,188
Rural	52.7	6.2	4.0	3.1	0.3	33.8	100.0	62.9	44.0	19,945
Division										
Barisal	39.5	3.8	2.5	2.8	0.2	51.2	100.0	45.8	37.0	1,525
Chittagong	59.9	8.1	4.8	3.0	0.3	23.9	100.0	72.7	45.5	6,261
Dhaka	53.3	9.1	5.2	3.5	0.6	28.4	100.0	67.5	54.4	6,862
Khulna	61.8	5.0	1.8	2.0	0.1	29.3	100.0	68.6	62.3	2,546
Mymensingh	57.5	6.0	5.3	3.3	0.2	27.6	100.0	68.8	33.2	2,273
Rajshahi	49.3	5.9	2.4	2.4	0.1	39.9	100.0	57.6	51.4	2,899
Rangpur	56.1	3.5	3.4	3.0	0.0	33.9	100.0	63.0	47.1	2,778
Sylhet	52.5	6.6	6.3	4.4	0.3	29.9	100.0	65.4	36.9	1,990
Mother's education										
No Education	38.9	5.9	4.2	3.6	0.5	46.9	100.0	49.0	24.5	2,293
Primary incomplete	45.9	5.3	4.5	3.2	0.2	40.9	100.0	55.7	29.7	4,195
Primary complete	47.2	5.7	4.2	3.6	0.2	39.1	100.0	57.1	35.6	4,103
Secondary incomplete	57.1	6.7	4.3	3.1	0.3	28.4	100.0	68.1	50.8	11,064
Secondary complete/higher	70.2	9.6	3.9	2.3	0.2	13.8	100.0	83.7	75.4	5,478
Wealth quintile										
Lowest	40.1	4.3	4.2	3.5	0.2	47.7	100.0	48.6	23.6	5,451
Second	50.0	5.4	4.0	3.3	0.2	37.2	100.0	59.4	38.1	5,513
Middle	56.4	6.2	3.7	2.9	0.3	30.4	100.0	66.4	48.1	5,350
Fourth	60.0	8.5	3.8	3.2	0.4	24.1	100.0	72.2	56.5	5,592
Highest	69.1	9.9	5.4	2.5	0.2	12.9	100.0	84.4	74.5	5,227
Total	55.0	6.8	4.2	3.1	0.3	30.6	100.0	66.0	48.0	27,133

¹ Defined as more than 2 days and within 60 days or 8 weeks

Figure 6.1. Trends in postnatal care for mothers within two days of delivery, 2013–2016



- About half of the mothers received postnatal care (PNC) from a medically trained provider within two days of delivery (Table 6.1; Table 6.2).
- An additional 18 percent of women received PNC only from a nonmedically trained provider. Among those who received care from any provider, most received PNC within four hours of delivery.
- In terms of differentials, relatively younger women are more likely to receive PNC from a medically trained provider than older women, and first-parity women were much more likely to receive PNC than those with higher parity. There is a strong positive association between PNC and education and wealth quintiles.
- Urban women have higher PNC coverage than their rural counterparts.
- There is a strong regional variation of PNC by a medically trained provider. It is lowest in Mymensingh (33 percent) and Sylhet and Barisal (37 percent) and highest in Khulna (62 percent).

Table 6.2. Type of provider of first postnatal checkup for the mother

Percentage distribution of women ages 15–49 who had live birth in the three years preceding the survey by type of provider for the mother's first postnatal checkup, within two days of delivery of the most recent live birth, and the percentage who had a postnatal checkup within two days of delivery, by a medically trained provider, according to background characteristics, Bangladesh 2016											
Background characteristics	Medically trained provider					Nonmedically trained provider ¹	Missing	No postnatal checkup ²	Total	Percentage receiving checkup within 2 days of delivery from a medically trained provider	Number of women
	Qualified doctor	Nurse/ midwife/ paramedic/ FWV	CSBA	MA/ SACMO							
Mother's age at birth											
Below 15	26.2	11.7	0.0	0.0	22.4	0.0	39.7	100.0	37.9	182	
15–19	37.6	10.7	0.2	0.0	18.3	0.1	33.0	100.0	48.6	7,307	
20–24	37.8	11.1	0.2	0.0	18.1	0.0	32.8	100.0	49.1	9,080	
25–29	37.7	9.2	0.3	0.0	17.4	0.0	35.4	100.0	47.2	6,503	
30–34	37.7	9.6	0.2	0.0	17.4	0.0	35.1	100.0	47.5	3,043	
35–39	34.0	9.3	0.0	0.0	20.4	0.1	36.2	100.0	43.3	840	
40–44	29.3	6.1	0.0	0.0	19.2	0.0	45.5	100.0	35.4	163	
45–49	*	*	*	*	*	*	*	*	*	14	
Birth order											
1	46.3	11.4	0.2	0.0	14.8	0.1	27.2	100.0	57.9	10,398	
2–3	34.9	10.0	0.2	0.0	18.4	0.0	36.4	100.0	45.1	13,506	
4–5	20.9	7.8	0.3	0.0	26.0	0.0	45.0	100.0	29.0	2,697	
6+	13.6	7.7	0.2	0.0	30.4	0.0	48.1	100.0	21.6	532	
Residence											
Urban	46.4	12.6	0.2	0.0	15.7	0.0	25.2	100.0	59.1	7,188	
Rural	34.3	9.5	0.2	0.0	18.8	0.1	37.1	100.0	44.0	19,945	
Division											
Barisal	27.9	8.8	0.1	0.1	8.9	0.0	54.2	100.0	37.0	1,525	
Chittagong	34.3	11.0	0.1	0.0	27.2	0.1	27.3	100.0	45.5	6,261	
Dhaka	44.8	9.5	0.1	0.0	13.1	0.1	32.5	100.0	54.4	6,862	
Khulna	49.6	12.5	0.2	0.0	6.4	0.0	31.4	100.0	62.3	2,546	
Mymensingh	23.4	9.4	0.4	0.0	35.6	0.0	31.2	100.0	33.2	2,273	

Percentage distribution of women ages 15–49 who had live birth in the three years preceding the survey by type of provider for the mother's first postnatal checkup, within two days of delivery of the most recent live birth, and the percentage who had a postnatal checkup within two days of delivery, by a medically trained provider, according to background characteristics, Bangladesh 2016

Background characteristics	Medically trained provider						No postnatal checkup ²	Total	Percentage receiving checkup within 2 days of delivery from a medically trained provider	Number of women
	Qualified doctor	Nurse/ midwife/ paramedic/ FWV	CSBA	MA/ SACMO	Nonmedically trained provider ¹	Missing				
Rajshahi	41.2	10.0	0.2	0.0	6.1	0.0	42.4	100.0	51.4	2,899
Rangpur	35.2	11.5	0.4	0.0	15.9	0.0	37.0	100.0	47.1	2,778
Sylhet	27.8	8.9	0.2	0.0	28.4	0.1	34.6	100.0	36.9	1,990
Mother's education										
No Education	16.5	8.0	0.0	0.0	24.4	0.1	51.0	100.0	24.5	2,293
Primary incomplete	20.3	9.1	0.2	0.0	26.0	0.0	44.3	100.0	29.7	4,195
Primary complete	26.0	9.4	0.1	0.0	21.3	0.1	42.9	100.0	35.6	4,103
Secondary incomplete	39.7	10.7	0.3	0.0	17.3	0.0	31.9	100.0	50.8	11,064
Secondary complete/higher	63.5	11.8	0.1	0.0	8.3	0.0	16.3	100.0	75.4	5,478
Wealth quintile										
Lowest	16.2	7.0	0.4	0.0	24.9	0.0	51.4	100.0	23.6	5,451
Second	27.8	10.0	0.3	0.0	21.3	0.0	40.6	100.0	38.1	5,513
Middle	36.7	11.3	0.2	0.0	18.2	0.0	33.6	100.0	48.1	5,350
Fourth	43.9	12.5	0.1	0.0	15.7	0.0	27.8	100.0	56.5	5,592
Highest	63.8	10.7	0.1	0.0	9.6	0.2	15.6	100.0	74.5	5,227
Total	37.5	10.3	0.2	0.0	18.0	0.1	34.0	100.0	48.0	27,133

¹ Includes Community Health Care Provider, HA, FWA, trained TBA, untrained TBA, unqualified doctor and 'other.'

² Includes those who had postnatal care after two days of delivery and those whose information on timing is missing.

Figure 6.2 Trends in postnatal care for mothers within two days of delivery, BMMS 2001, 2010, and 2016

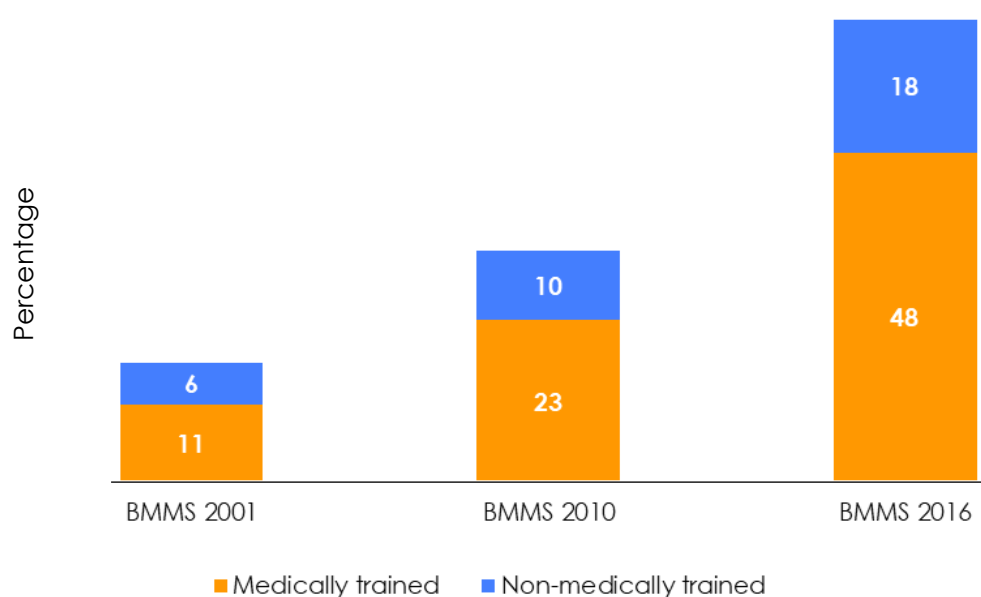


Table 6.3. Type of provider of PNC for the mother by place of delivery

Percentage distribution of women ages 15–49 who had a live birth in the three years preceding the survey, for which the mother received PNC within two days of delivery, for most recent live birth, by type of provider, according to place of delivery, Bangladesh 2016				
Type of provider	Place of delivery			Total ²
	Facility	Home	Other	
Qualified doctor	76.2	2.0	47.2	37.5
Nurse/midwife/paramedic/FWV	17.7	3.4	21.1	10.3
CSBA	0.1	0.3	0.0	0.2
MA/SACMO	0.0	0.0	0.2	0.0
Community health worker ¹	0.6	4.1	0.3	2.4
Other	0.3	29.7	14.4	15.6
Missing	0.0	0.1	0.0	0.1
No postnatal checkup within two days	5.2	60.3	16.8	34.0
Total	100.0	100.0	100.0	100.0
Number of women	12,912	14,120	87	27,133

¹ Community health worker includes Community Health Care Provider, HA, FWA, and NGO health worker

² Total includes 14 missing cases

- Postnatal checkup from a medically trained provider has more than doubled between BMMS 2010 and BMMS 2016 (Figure 6.2).
- At the same time, postnatal checkup by a nonmedical provider also increased from 10 to 18 percent.
- In only six percent of home deliveries, the mothers received PNC from a medically trained provider within two days of delivery (Table 6.3).

Figure 6.3. Completeness of maternity care: BMMS 2016

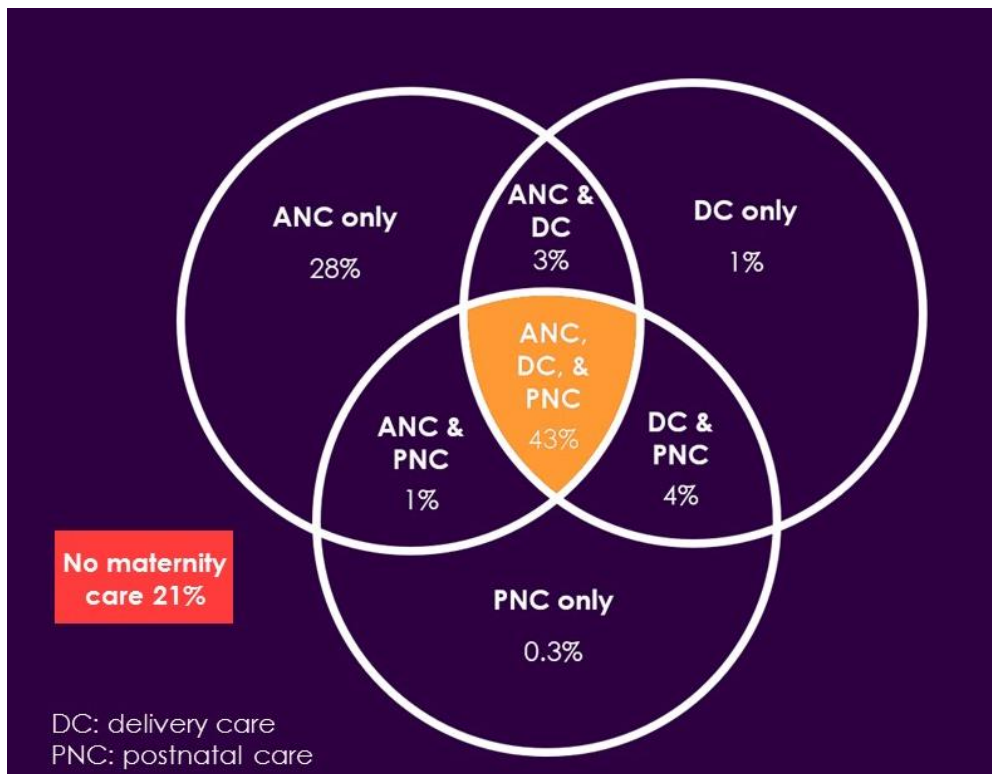
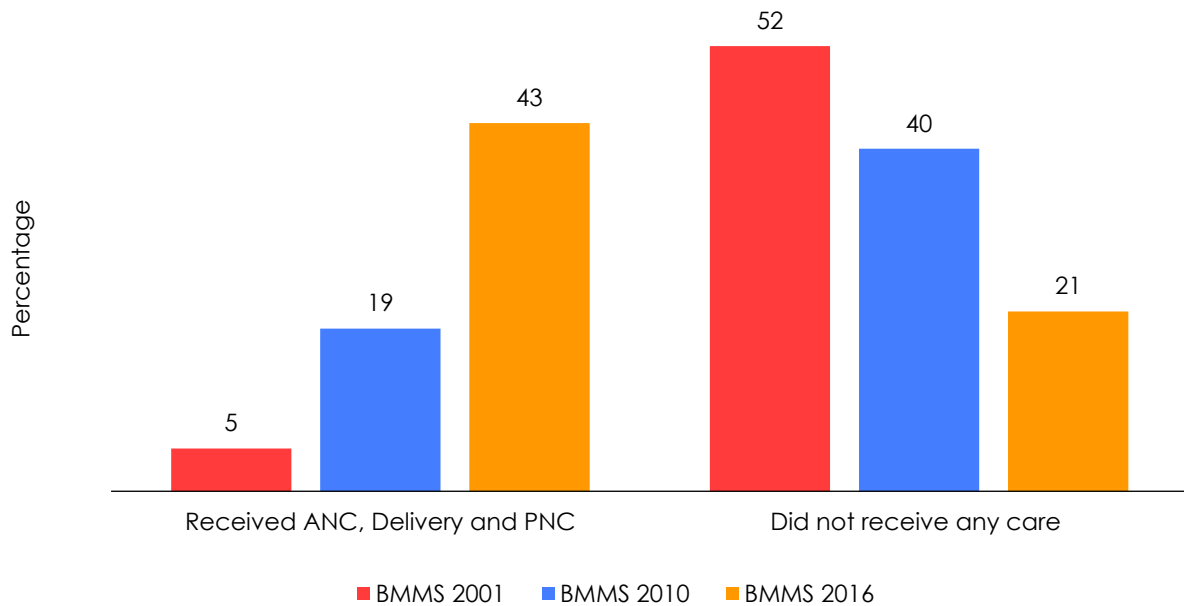


Figure 6.4. Trends in completeness of maternity care from a medically trained provider, BMMS 2001, 2010, and 2016



- More than two out of five women received complete maternity care (ANC, delivery care [DC], and PNC within two days of delivery) from a medically trained provider (Figure 6.3).
- The percentage of women receiving the complete maternal health care has increased significantly, from five percent in BMMS 2001 to 43 percent in BMMS 2016 (Figure 6.4).

SECTION 7: CARE SEEKING FOR MATERNAL COMPLICATIONS

SUMMARY

- Almost half (49 percent) of women reported that they had at least one complication during pregnancy/delivery or after delivery.
- Overall, 67 percent of women with complications sought care from any health provider.
- Among women reporting maternal complications, 46 percent sought care from a health facility.
- The proportion seeking health care from any provider has not increased between BMMS 2010 (68 percent) and BMMS 2016 (67 percent). But there is a notable shift towards care seeking from health facilities. Facility-based health care for maternal complications increased, from 29 percent in BMMS 2010 to 46 percent in BMMS 2016.
- Home-based care for maternal complications declined from 15 percent to three percent between BMMS 2010 and BMMS 2016—an encouraging trend.
- Women from the richest wealth quintile who had maternal complications are twice as likely to seek care from a health facility compared to women from households in the poorest wealth quintile. The poor-rich inequity in use of facility-based care for maternal complication has declined in the past 15 years. In BMMS 2001, women from the richest households were five times more likely to seek facility-based care than those in the poorest household.
- Women who have completed at least secondary education were 1.9 times more likely to seek facility-based care for maternal complications than those with no education. In the past 15 years there has been a steady increase in seeking care from health facilities for maternal complications among women with no education, from nine percent in BMMS 2001 to 32 percent in BMMS 2016, resulting in increased equity in this behavior by educational status.

Table 7.1. Women reporting recent maternal complications

Percentage of last live births, in the three years preceding the survey, for which women reported complications during pregnancy, during delivery, or after delivery, by type of complications and timing of complications, Bangladesh 2016				
Type of complications	Complications			
	During pregnancy	During delivery	After delivery	Any stage
Had no complication	62.4	74.1	79.0	50.4
Had at least 1 complication	37.4	25.7	20.7	49.3
Symptoms of preeclampsia ¹	31.5	14.4	14.0	36.5
Obstructed/prolonged labor ²	8.1	11.4	0.0	17.1
Severe/heavy bleeding	1.3	2.2	5.8	7.9
Retained placenta	0.0	0.9	1.2	1.8
High fever with smelly discharge	0.0	0.0	1.1	1.1
Convulsion/fits	2.1	1.5	3.3	6.2
Number of women	27,133	27,133	27,133	27,133

¹ Includes severe headache with blurred vision/high blood pressure/oedema face/feet/body.

² Includes leaking membrane and no labor pain for >6 hours/ mal-presentation/ prolonged labor (>12 hours).

Figure 7.1. Percentage of women reporting maternal complications, BMMS 2010 and BMMS 2016

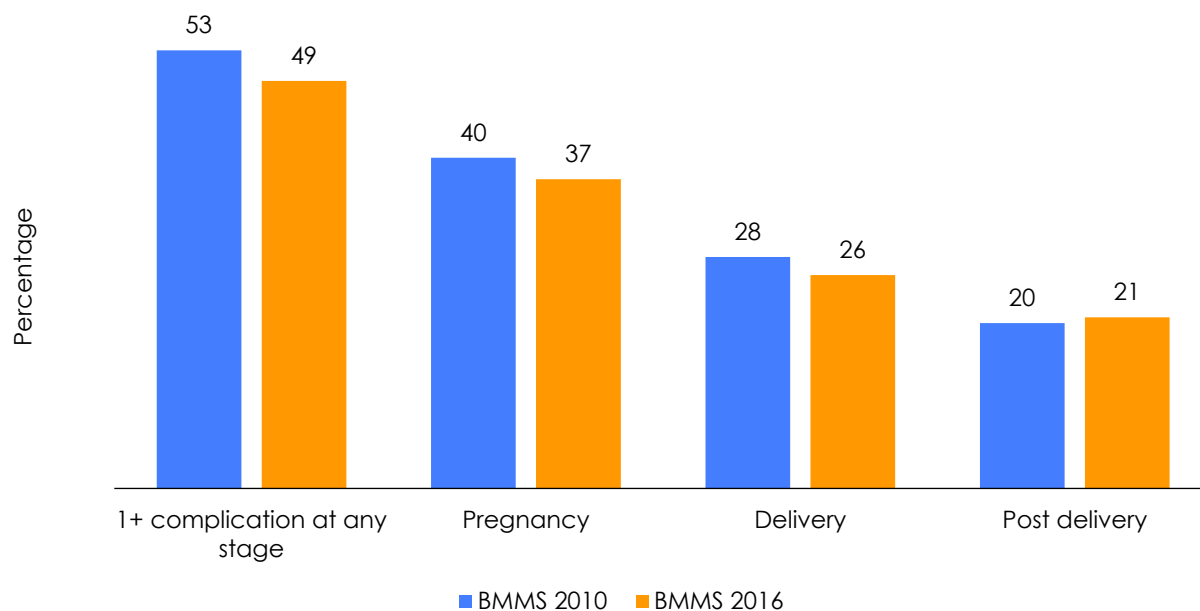
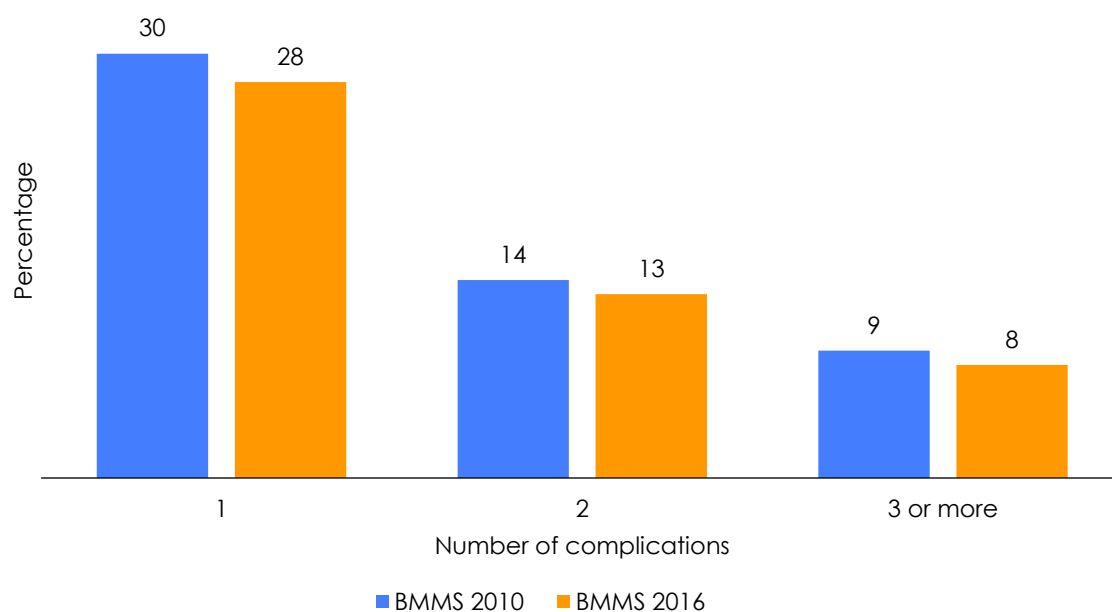


Figure 7.2. Percentage of women by number of reported maternal complications, BMMS 2010 and BMMS 2016



- Almost half (49 percent) of the women reported that they had at least one complication during their last birth in the three years before the survey (Table 7.1; Figure 7.1). The pattern of complication reporting in BMMS 2016 is similar to that reported in BMMS 2010.
- Women were more likely to experience complications during pregnancy. Almost two out of five women reported experiencing complications during pregnancy; whereas one in four women had complications during delivery, and one in five after delivery.
- Symptoms of preeclampsia (severe headache/blurry vision/some oedema) were the most common complications experienced (37 percent), followed by prolonged/obstructed labor (17 percent), severe/heavy bleeding (eight percent) and convulsions (6 percent).
- In BMMS 2016, over one in five women reported that they experienced more than one complication during pregnancy/delivery/after delivery (Figure 7.2).

Table 7.2. Care seeking for complications

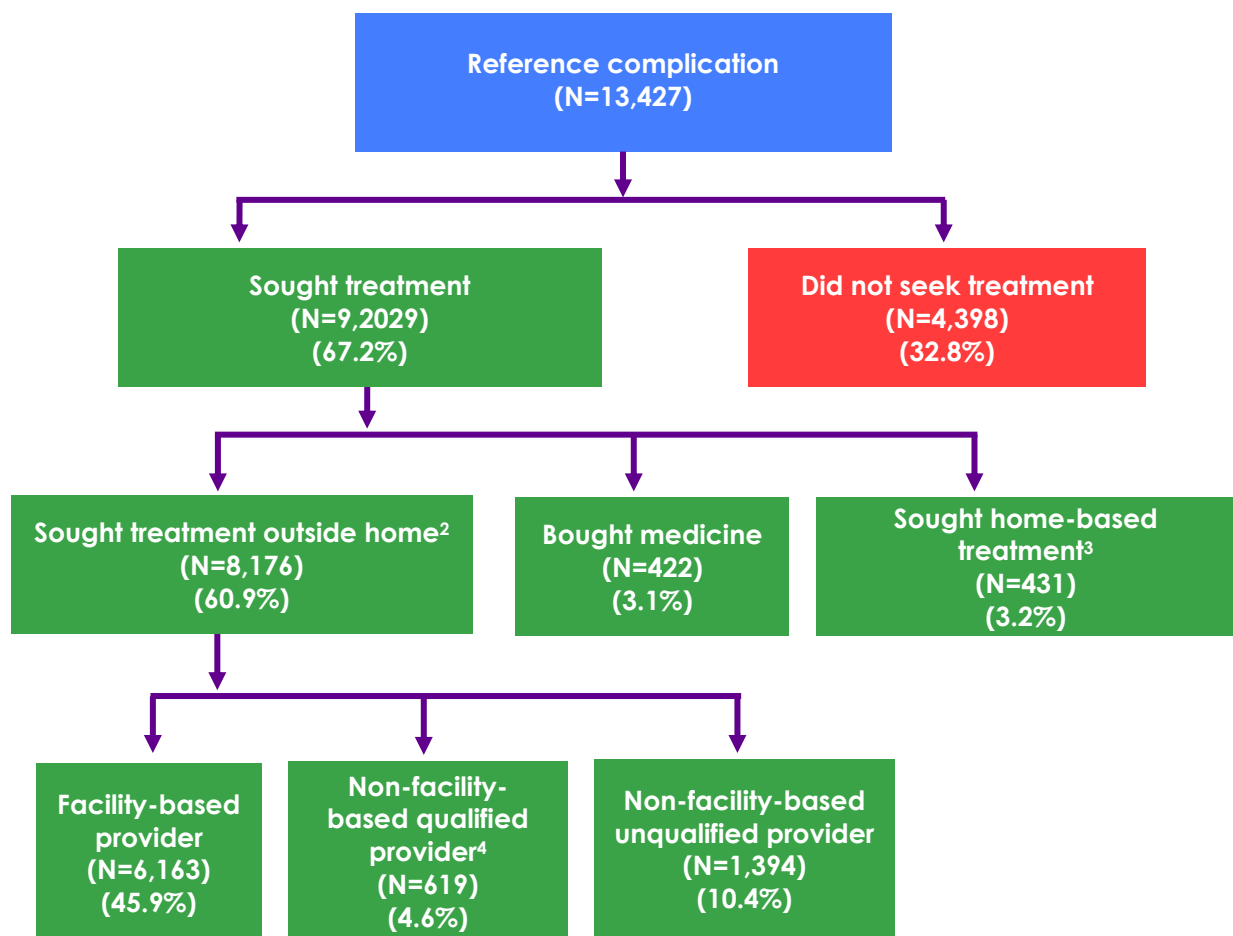
Percentage of last live births, in the three years preceding the survey, with complications during pregnancy, during delivery or after delivery, for which treatment was sought for last complication, by type of complication and background characteristics, Bangladesh 2016		
Background characteristics	Sought treatment ¹	Number of women with complication ²
Type of complication		
Symptoms of preeclampsia	57.7	7,636
Obstructed/prolonged labor	79.0	2,983
Severe/heavy bleeding	83.1	1,520
Retained placenta	60.6	328
High fever with smelly discharge	79.8	192
Convulsion/fits	84.6	768
Residence		
Urban	67.9	3,707
Rural	67.0	9,720
Division		
Barisal	67.0	760
Chittagong	71.9	3,278
Dhaka	62.8	3,747
Khulna	68.6	1,155
Mymensingh	64.1	991
Rajshahi	65.6	1,339
Rangpur	69.4	1,109
Sylhet	70.1	1,048
Mother's education		
No education	57.4	1,085
Primary incomplete	60.4	2,120
Primary complete	62.5	1,987
Secondary incomplete	70.1	5,474
Secondary complete/higher	74.2	2,761
Wealth quintile		
Lowest	62.8	2,618
Second	64.7	2,683
Middle	67.7	2,623
Fourth	67.3	2,862
Highest	73.7	2,642
Total	67.2	13,427

¹ Includes those who brought medicine to treat the complication.

² Excludes 28 cases who had multiple complications and could not identify the complication that occurred last.

- Overall, almost seven out of 10 women (67 percent) who experienced any maternal complications sought treatment from a health provider (Table 7.2).
- Women who experienced convulsions or severe/heavy bleeding were most likely to seek treatment (85 percent and 83 percent, respectively), while those who had symptoms of preeclampsia were least likely to seek care (58 percent).
- There was no difference in care seeking among urban and rural women.
- Care seeking likelihood increased with women's education and household wealth quintile.
- Women in Chittagong were most likely to seek treatment (72 percent), while those from Dhaka were least likely to seek any health care for complications (63 percent).

Figure 7.3. Path diagram of treatment-seeking behavior¹ for maternal complications, BMMS 2016



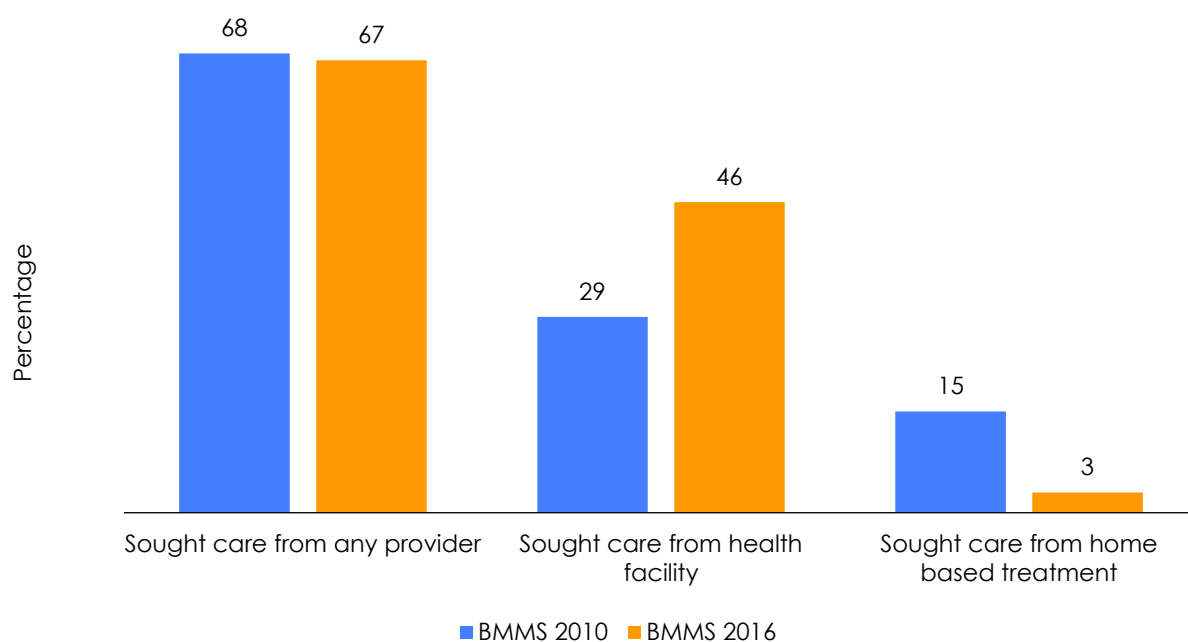
¹ Treatment places are hierarchically presented, because treatment was sought from multiple sources in some cases.

² May have received treatment at home as well

³ Did not seek treatment outside of home

⁴ Qualified providers include MBBS/nurse/paramedic/FWV/CSBA/MA/SACMO

Figure 7.4. Trends in treatment-seeking for maternal complications



- Although the percentage of respondents who sought treatment for maternal complications remains almost unchanged between BMMS 2016 and BMMS 2010 (67 percent and 68 percent respectively), there has been a noticeable change in the source of care (Figures 7.3 and 7.4).
- In BMMS 2016, among women who had complications, 46 percent sought treatment from a health facility. Seeking facility-based health care for maternal complications increased by 17 percentage points between BMMS 2010 and 2016.
- Home-based treatment for maternal complications declined from 15 percent in BMMS 2010 to three percent in BMMS 2016.

Table 7.3. Number of places where health care was sought by type of complications

Type of complications	Number of places where care was sought			Total	Number of women who sought treatment ¹
	One place only	Two places	Three or more places		
Symptoms of preeclampsia	74.8	15.7	9.5	100.0	4,151
Obstructed/prolonged labor	91.2	7.5	1.3	100.0	2,299
Severe/heavy bleeding	79.6	14.5	5.8	100.0	1,189
Retained placenta	89.6	7.3	3.1	100.0	195
High fever with smelly discharge	73.8	17.9	8.3	100.0	145
Convulsion/fits	81.9	13.3	4.8	100.0	629
Total	80.7	13.0	6.3	100.0	8,607

¹ Excludes those who reported only getting medicine.

Figure 7.5. Number of places where health care was sought among those who sought care for maternal complications, BMMS 2016

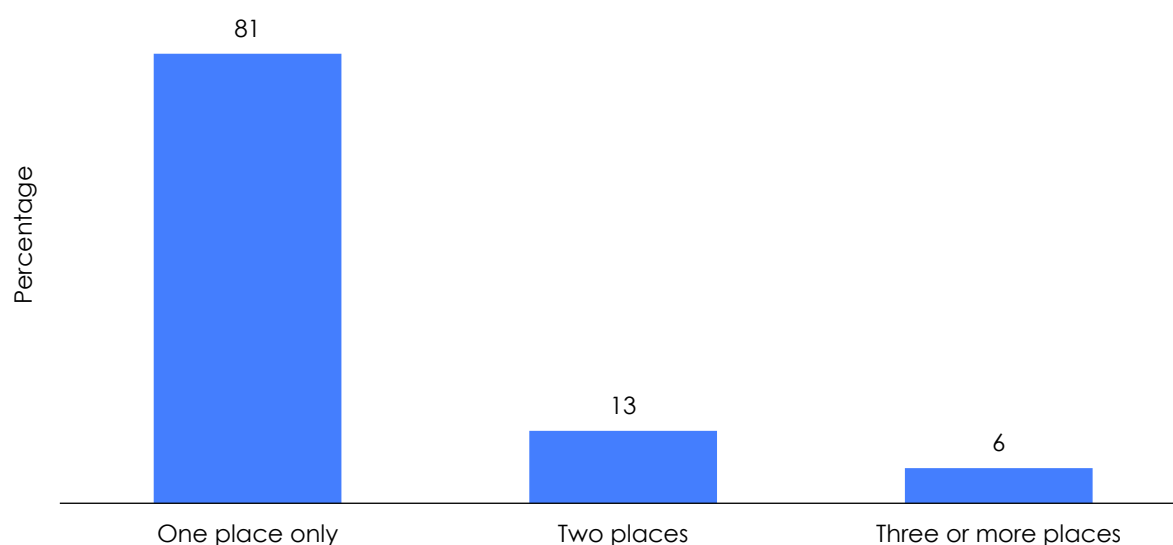


Table 7.4. First source where treatment was sought for maternal complications

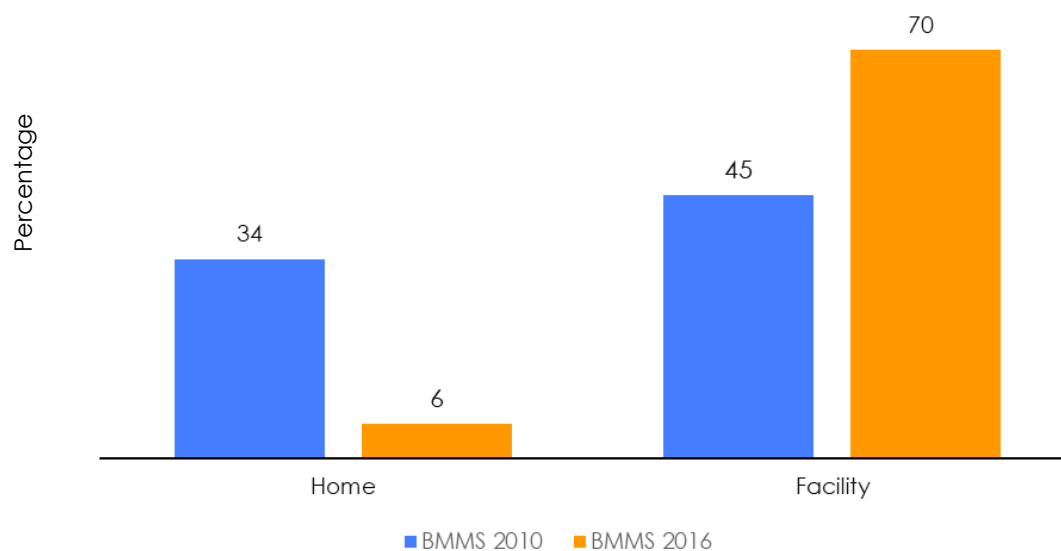
Type of complications	Source of first care							Total	Number of women who sought treatment ³
	Home	Government facility	NGO facility	Private facility	Private: qualified doctor	Private: Pharmacy or unqualified doctor	Other		
Symptoms of preeclampsia ¹	2.1	23.1	4.9	42.2	10.7	15.3	1.7	100.0	4,151
Obstructed /Prolonged labor ²	9.1	28.5	5.5	42.0	2.1	10.7	2.0	100.0	2,299
Severe/heavy bleeding	7.4	26.1	3.9	31.2	7.8	23.1	0.5	100.0	1,189
Retained placenta	23.0	31.3	3.3	20.0	3.9	16.7	1.8	100.0	195
High fever with smelly discharge	6.8	24.1	3.4	31.7	9.2	24.0	0.7	100.0	145
Convulsion/fits	9.4	28.2	4.0	35.8	5.7	15.5	1.2	100.0	629
Total	5.8	25.5	4.8	39.5	7.5	15.4	1.6	100.0	8,607

¹ Includes severe headache with blurred vision/high blood pressure/oedema face/feet/body

² Leaking membrane and no labor pain for >6 hours/mal-presentation/prolonged labor (>12 hours)

³ Excludes those who reported only getting medicine

Figure 7.6. First source where treatment was sought for maternal complications among women sought care, BMMS 2010 and BMMS 2016



- Among women who sought care for maternal complications—most sought treatment from one place. However, one in five women sought care from more than one source (Table 7.3).
- A private health facility was the most likely choice as the first source of care, followed by public sector health facilities, among those who sought care for complications. Overall, seven out of 10 women’s first source of treatment was a health facility—public, NGO, or private (Table 7.4).
- It is encouraging to see that home-based care as the first source of care declined from 34 percent to six percent, between BMMS 2010 and BMMS 2016, while facility-based care increased from 45 percent to 70 percent during the same period (Figure 7.6).

Table 7.5. Reasons for not seeking treatment for complications

Type of complications	Reasons for not taking treatment							Number of women
	Not necessary, not serious	Cost too much, lack of money	Access problem*	Family didn't allow	Poor quality, better quality at home	Others**	Not customary	
Symptoms of preeclampsia ¹	83.0	15.4	1.3	2.3	1.6	1.8	1.3	3,229
Obstructed/prolonged labor ²	70.6	21.7	5.0	7.0	2.9	4.5	2.9	626
Severe/heavy bleeding	67.3	30.0	1.1	4.8	4.1	3.2	1.6	257
Retained placenta	73.8	24.1	2.5	3.0	2.5	0.7	1.6	129
High fever with smelly discharge	71.8	33.6	0.0	4.3	4.3	6.6	0.0	39
Convulsion/fits	73.4	25.0	2.1	3.5	4.9	4.7	2.1	118
Total	79.7	17.8	1.8	3.2	2.1	2.3	1.5	4,398

* Access problem include 'too far', 'transport problem', 'no one to accompany', 'not known how to go', and 'not known where to go'.

** Others include 'no time to go', 'not want service from male provider', 'afraid to go', 'clinic / hospital insist Cesarean', 'had sudden delivery', and 'others'.

¹ Includes Severe headache with blurred vision/high blood pressure/oedema face/feet/body

² Leaking membrane and no labor pain for >6 hours/mal-presentation/prolonged labor (>12 hours)

- Four out of five women who did not seek treatment for complication cited that the reason for not seeking care was the perception that the condition was not serious or that treatment for the complication was not necessary. The second most common reason for not seeking care was related to economics—cost of service was high or household did not have the means to pay for service (Table 7.5).
- Family prohibition and poor service quality were not prominent reasons for not seeking care—only three percent and two percent of women, respectively, cited these two reasons.

Table 7.6. Health care seeking for maternal complications by place of care and wealth quintiles

Percentage of last live births in the three years preceding the survey for which women had complications during pregnancy/delivery/after delivery, for which treatment was sought, by place of care and household wealth quintile, Bangladesh 2016					
Care-seeking behavior	Wealth quintile				
	Lowest	Second	Middle	Fourth	Highest
Facility-based provider	30.5	39.4	45.9	51.0	62.2
Non-facility-based qualified provider	5.2	5.5	4.6	4.2	3.5
Non-facility-based unqualified provider	22.4	16.1	13.1	9.6	6.9
Sought home-based treatment	4.6	3.6	4.1	2.5	1.2
Did not seek treatment	37.2	35.3	32.3	32.7	26.3
Total	100.0	100.0	100.0	100.0	100.0
Number	2,618	2,683	2,623	2,862	2,642

Table 7.7. Health care seeking for maternal complications by place of care and women's education

Percentage of last live births, in the three years preceding the survey, for which women had complications during pregnancy/delivery/after delivery, for which treatment was sought, by place of care and women's education, Bangladesh 2016					
Care-seeking behavior	Women's education				
	No education	Primary incomplete	Primary complete	Secondary incomplete	Secondary complete or higher
Facility-based provider	31.9	33.5	38.3	48.3	61.5
Non-facility-based qualified provider	3.9	4.3	5.0	5.1	3.8
Non-facility-based unqualified provider	17.6	18.8	15.5	13.4	6.8
Sought home-based treatment	4.0	3.8	3.7	3.2	2.1
Did not seek treatment	42.6	39.6	37.5	29.9	25.8
Total	100.0	100.0	100.0	100.0	100.0
Number	1,085	2,120	1,987	5,474	2,761

¹ Includes 'someone brought medicine'

Figure 7.7. Care-seeking from health facility for maternal complications by wealth quintiles, BMMS 2001, 2010, and 2016

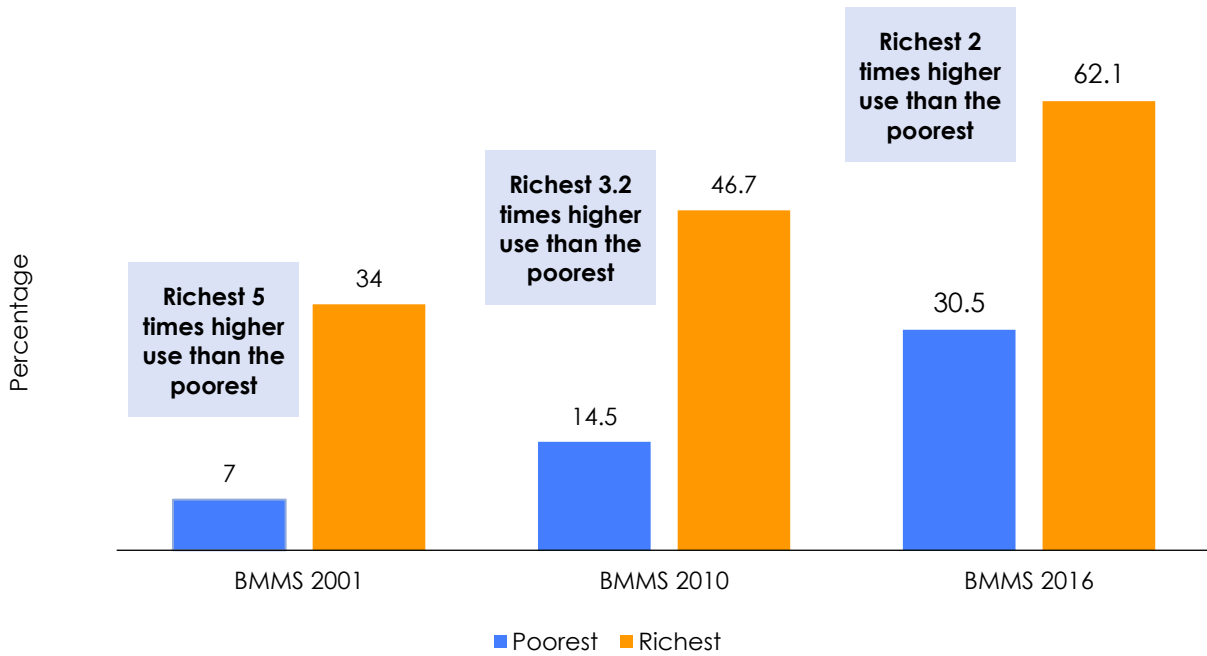
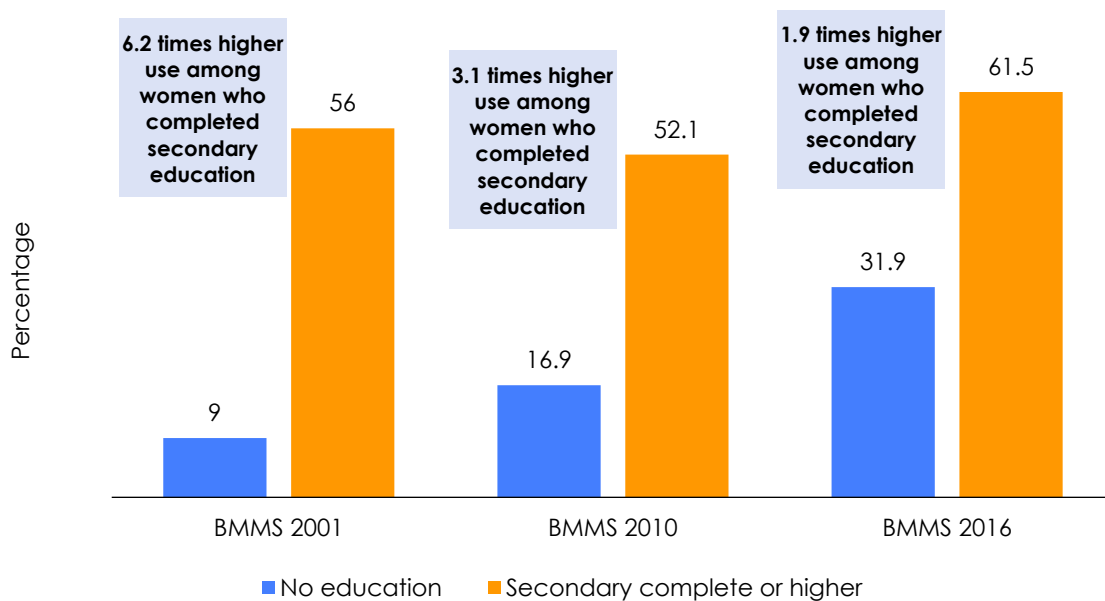


Figure 7.8. Care-seeking from health facility for maternal complications by women's education, BMMS 2001, 2010, and 2016



- As expected, the likelihood of seeking treatment for maternal complications increases with household wealth and education of women (Table 7.6; Table 7.7).
- Even among the poorest households, or among women with no education, seeking treatment from a health facility was the most common source of care for maternal complications. Almost one-third of women in the poorest households, or with no education, sought care from a health facility.
- Fewer than five percent of women sought home-based treatment for complications, even among the poorest and women with no education. In BMMS 2010, home-based care was sought for maternal complications by 18 percent of women in the poorest households and 14 percent of women with no education.
- The poor-rich inequity in seeking facility care (measured by poorest-richest use ratio) for maternal complications also declined. During the six-year period between BMMS 2016 and BMMS 2010 the percentage of women from the poorest households who sought facility-based care for treatment of complications doubled (from 15 percent to 31 percent); however, the relative increase was less marked for the richest women (47 to 62 percent). In BMMS 2016, women in the richest quintile were twice as likely to seek facility care for complications compared to those in the poorest quintile. This ratio was 3.3 times higher in the 2010 survey and five times higher in 2001 survey, indicating that the inequity in use of health facility for maternal complications between the poorest and the richest has been declining steadily during the past 15 years (Figure 7.7).
- Between BMMS 2010 and BMMS 2016, treatment-seeking from a facility among women with no education almost doubled (from 17 percent to 32 percent, respectively), while the increase was less among women who completed secondary education (from 52 percent to 62 percent, respectively). As a result, the inequity in health service use between these two education groups declined over the past six-year period.

SECTION 8: DELIVERY EXPENDITURE

SUMMARY

- Three out of four normal deliveries occur at home, and four out of five C-section deliveries occur at private health facilities. The median cost for delivery varied considerably by the type of location where the delivery occurred and whether the delivery was normal or by C-section.
- The median expenditure related to normal deliveries at home is less than Taka 1,000. The median expenditures for normal deliveries at a facility are four times greater than for home delivery.
- Normal delivery costs the most at private facilities (around Taka 6,800). There was a small difference in median expenditures between deliveries conducted in government and NGO facilities (around Taka 3,000 and Taka 2,600 respectively).
- The median expenditure for C-section deliveries is five times higher than the median expenditure associated with normal deliveries at facilities.
- The median expenditure associated with C-section deliveries at private facilities was around Taka 20,000. In comparison, the median expenditure for C-section deliveries was lowest in government facilities, around Taka 12,000.
- Family fund is the most common source to cover expenditures related to facility delivery. Almost 20 percent of households had to take loan, and two percent sold or mortgaged assets to cover the expenditures.
- Among women in households in the poorest two wealth quintiles who delivered in a facility, one-third of the households took a loan; and five percent sold or mortgaged assets to cover the cost of delivery. In addition, 28 percent of households received gifts from relatives to help pay maternal care expenditures.

Table 8.1. Delivery expenditures by place of delivery

Place of delivery	Amount spent for last delivery							Total	Mean	Median	Number of births
	Nothing	<500	500–999	1,000–4,999	5,000–9,999	10,000 or more	Missing				
Normal delivery											
Public	0.6	1.8	6.3	57.5	24.2	8.5	1.0	100.0	4,130	2,997	2,490
Private	0.4	0.1	0.2	25.2	39.7	33.2	1.3	100.0	9,160	6,806	1,383
NGO	1.8	2.0	8.3	52.5	23.2	10.6	1.6	100.0	4,160	2,594	585
Home	3.8	20.2	24.2	45.2	4.7	1.0	0.9	100.0	1,459	993	14,120
Other/missing*	5.8	7.2	5.8	39.8	21.1	9.0	11.4	100.0	4,175	2,988	83
Total	3.1	15.6	19.5	45.6	10.5	4.7	1.0	100.0	2,479	1,008	18,662
C-section delivery											
Public	1.8	0.8	0.1	8.3	20.7	67.2	1.3	100.0	15,447	12,381	1,384
Private	0.1	0.0	0.0	0.9	4.0	94.1	0.8	100.0	22,468	19,982	6,667
NGO	0.6	0.0	0.5	3.6	10.9	83.3	1.1	100.0	19,316	15,460	403
Other/missing*	*	*	*	*	*	*	*	*	*	*	18
Total	0.4	0.1	0.1	2.3	7.0	89.2	0.9	100.0	21,185	19,930	8,472
All deliveries											
Public	1.0	1.4	4.1	39.9	23.0	29.4	1.1	100.0	8,167	4,960	3,874
Private	0.2	0.0	0.1	5.1	10.1	83.7	0.9	100.0	20,191	18,945	8,050
NGO	1.3	1.2	5.1	32.5	18.2	40.3	1.4	100.0	10,364	6,095	989
Home	3.8	20.2	24.2	45.2	4.7	1.0	0.9	100.0	1,459	993	14,120
Other/missing*	6.0	5.9	4.8	33.7	18.2	21.9	9.4	100.0	8,582	3,068	101
Total	2.2	10.8	13.4	32.0	9.4	31.1	1.0	100.0	8,324	2,481	27,133

* Place of delivery not known

Figure 8.1. Distribution of normal/C-section deliveries by place of delivery

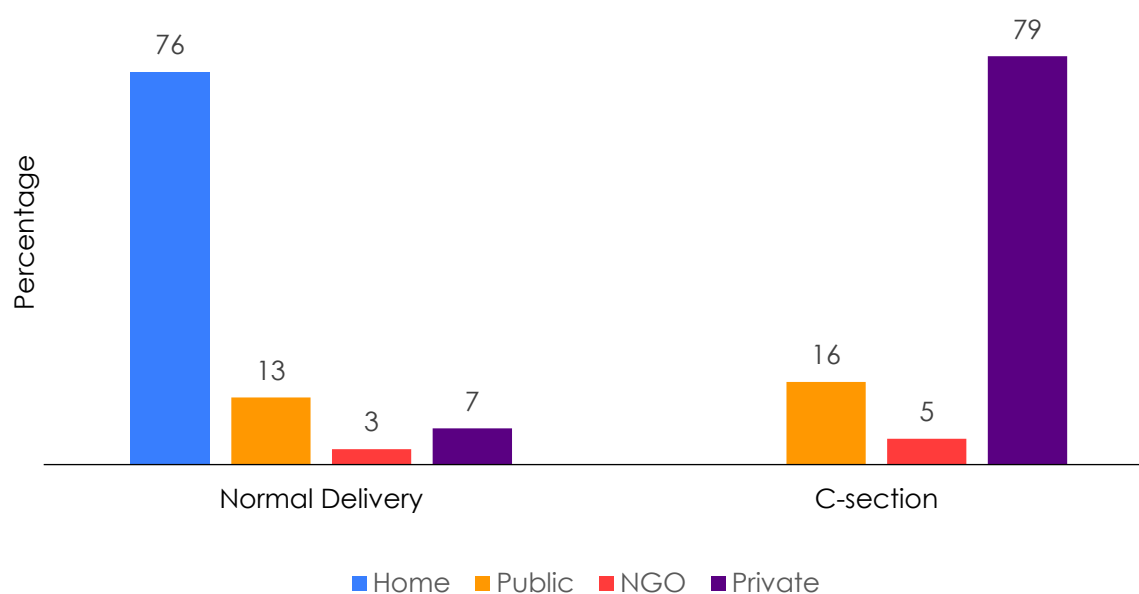
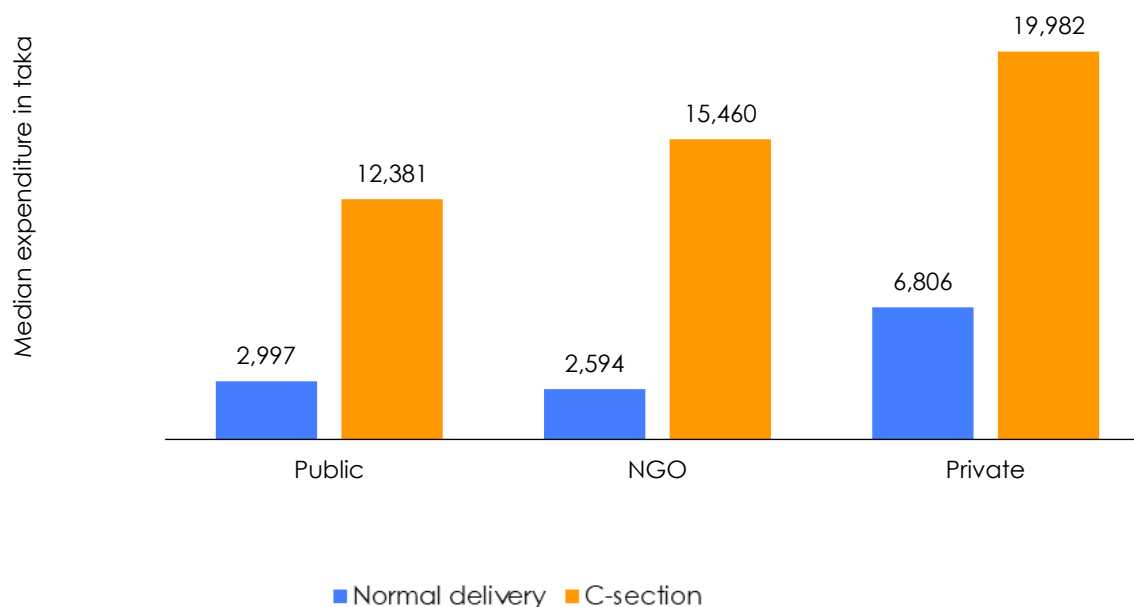


Figure 8.2. Median delivery expenditures in Taka for normal delivery and C-section, BMMS 2016



- Expenditures related to childbirth depend upon whether the delivery occurred in a facility and whether it was normal delivery or C-section.
- Seventy-six percent of the normal deliveries occurred at home, 13 percent in public, seven percent in private and three percent in NGO facilities (Figure 8.1).
- For normal delivery, the median expenditures were the lowest for home delivery (around Taka 1,000) and the highest for delivery at private facilities—around Taka 6,800 (Table 8.1; Figure 8.2).
- The median cost related to normal delivery at a health facility was around Taka 4,000. There was little difference in mean and median expenditures for normal deliveries in public and NGO health facilities. The median cost associated with normal deliveries in a private facility was 2.3 times and 2.6 times higher than the median expenditures associated with deliveries at public facilities (around Taka 3,000) and NGO facilities (around Taka 2,600).
- Seventy-nine percent of all C-section deliveries took place in private facilities, 16 percent in public facilities, and five percent in NGO health facilities (Figure 8.1).
- The median expenditures associated with C-section delivery was around Taka 20,000—which is five times higher than the median expenditure related to normal facility deliveries. Expenditures related to C-section deliveries were the highest in private facilities (median around Taka 20,000; mean around Taka 22,000) and the lowest in public facilities (median around Taka 12,000; mean around 15,000) (Table 8.1; Figure 8.2).

Table 8.2. Source of fund for facility delivery by wealth status

Percentage of last live births in the three years preceding the survey that were delivered at a health facility and incurred a cost for delivery, by source of fund for maternal health care related to childbirth, according to household wealth status, BMMS 2016			
Source of fund	Wealth status		
	Poor (2 bottom wealth quintiles)	Non-poor (3 top wealth quintiles)	All households
Family fund	68.4	85.2	81.0
Loan	33.1	15.1	19.7
Sold assets	3.8	1.0	1.7
Mortgaged assets	1.0	0.3	0.5
Gift from relatives	27.7	20.4	22.2
Gift from friends	0.3	0.4	0.3
Other source	0.6	0.3	0.4
Don't know/missing	0.3	0.6	0.5
Number of births	3,239	9,606	12,846

Multiple responses possible

- The most common source of fund to cover expenditures related to childbirth at health facilities was family fund. The second most common source was gifts from relatives. One in five households had to take loan (Table 8.2).
- Among women in households in the poorest two wealth quintiles who delivered in a facility, one in three had to take a loan, while five percent sold or mortgaged assets. A substantial proportion (28 percent) also received gifts from relatives to cover expenditures related to childbirth in a health facility.

SECTION 9: BIRTH PLANNING AMONG PREGNANT WOMEN

SUMMARY

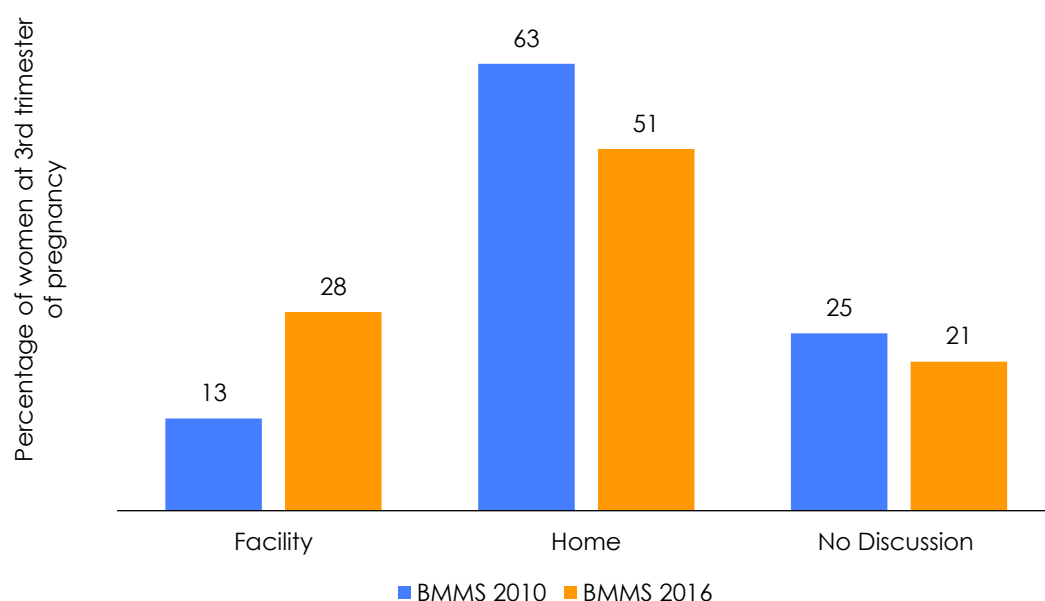
- Appropriate birth planning is still not common in Bangladesh. However, birth planning has improved between 2010 and 2016.
- Only 28 percent of pregnant women in their third trimester of pregnancy reported that the family had discussed or decided to deliver at a health facility. In 2010, this proportion was lower (13 percent).
- Eighteen percent of pregnant women in their third trimester of pregnancy reported that their family had prearranged transport for emergency. There is very little change in this aspect of birth planning between 2010 and 2016.
- Thirty-eight percent of pregnant women in BMMS 2016 reported that their family had prearranged funds for delivery/emergency maternal care, compared to 31 percent in 2010.
- Twelve percent of pregnant women in their third trimester of pregnancy reported that their family has arranged for sources of blood in case of emergency.
- Pregnant women's knowledge of maternal complications was low. The most commonly known complication was symptoms of preeclampsia—46 percent knew about it. Only one in three pregnant women had mentioned severe/heavy bleeding or convulsions as maternal complications.

Table 9.1. Family discussion/decision about place of delivery

Percentage of currently pregnant women in the third trimester of pregnancy at the time of interview, by the place of delivery they have decided on, according to background characteristics, Bangladesh 2016								
Background characteristics	Did not decide	Decided place of delivery						Number of women
		Public	NGO	Private	Home	Other	Total	
Age								
15–19	21.3	9.3	3.9	10.5	54.9	0.0	100.0	526
20–24	21.5	11.8	2.8	13.7	50.1	0.1	100.0	643
25–29	19.2	13.3	1.4	13.5	52.6	0.2	100.0	412
30–34	20.9	15.0	3.1	20.3	40.6	0.0	100.0	213
35–39	25.0	7.9	3.6	7.2	56.2	0.0	100.0	60
40–44	*	*	*	*	*	*	*	6
45–49	*	*	*	*	*	*	*	1
Duration of pregnancy								
7 months	26.3	11.3	2.7	12.5	47.2	0.0	100.0	762
8 months	17.8	11.7	3.0	12.4	54.9	0.2	100.0	781
9 months	15.9	12.3	2.9	17.3	51.6	0.0	100.0	319
Birth order								
1	23.3	10.5	3.7	13.4	49.1	0.0	100.0	750
2–3	18.3	14.5	2.1	15.0	49.9	0.1	100.0	899
4–5	21.5	4.5	2.8	5.7	65.7	0.0	100.0	166
6+	[32.2]	[0.0]	[4.6]	[3.4]	[59.7]	[0.0]	[100.0]	47
Residence								
Urban	19.2	17.5	5.4	20.4	37.4	0.1	100.0	483
Rural	21.6	9.6	2.0	10.8	56.1	0.1	100.0	1,379
Division								
Barisal	22.5	13.3	0.3	9.5	54.4	0.0	100.0	84
Chittagong	18.5	12.1	3.6	7.5	58.2	0.1	100.0	445
Dhaka	15.6	10.9	3.8	23.0	46.7	0.0	100.0	497
Khulna	15.8	18.7	0.6	22.8	42.1	0.0	100.0	170
Mymensingh	32.4	5.4	0.8	3.7	57.7	0.0	100.0	158
Rajshahi	24.2	14.9	2.2	11.6	47.1	0.0	100.0	167
Rangpur	26.6	9.9	4.0	11.5	47.9	0.0	100.0	204
Sylhet	28.4	8.9	2.7	3.0	56.4	0.6	100.0	137
Level of education								
No education	27.2	6.0	2.9	4.2	59.8	0.0	100.0	141
Primary incomplete	26.7	3.1	2.8	3.2	64.2	0.0	100.0	272
Primary complete	22.6	12.2	4.4	5.3	55.4	0.0	100.0	239
Secondary incomplete	20.8	12.3	1.9	12.9	52.1	0.1	100.0	806
Secondary complete or higher	14.3	17.6	4.0	28.6	35.2	0.2	100.0	404
Wealth quintile								
Lowest	27.5	5.5	.3	3.2	63.5	0.0	100.0	379
Second	22.4	7.1	1.5	6.4	62.7	0.0	100.0	401
Middle	23.3	9.9	2.8	9.2	54.8	0.0	100.0	345
Fourth	16.4	15.9	4.9	17.8	44.9	0.1	100.0	414
Highest	14.9	20.7	5.0	32.2	26.9	0.3	100.0	323
Total	21.0	11.6	2.9	13.3	51.2	0.1	100.0	1,862

Note: Birth order of the current pregnancy is derived as the sum of the total number of live births plus one.

Figure 9.1. Trends in family discussion about place of delivery, BMMS 2010 and 2016



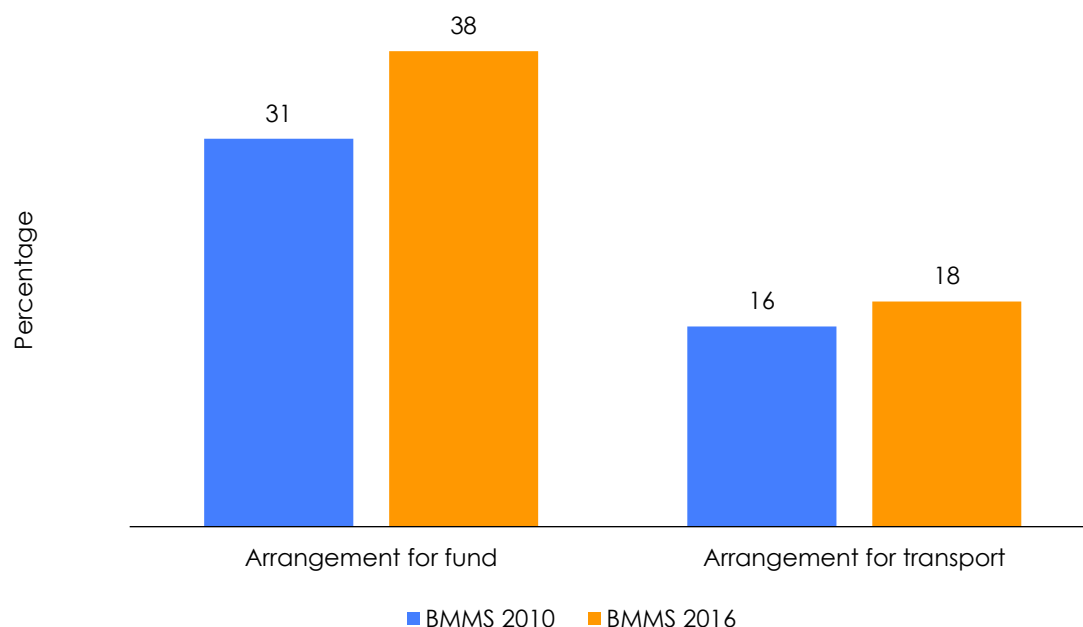
- One in five pregnant women in their third trimester of pregnancy reported that there was no discussion/decision in the family on where the delivery would take place (Table 9.1; Figure 9.1).
- Fewer than one in three (28 percent) pregnant women in their third trimester of pregnancy reported that the family discussed/decided that the delivery would be at a facility. This indicator on appropriate birth planning shows some improvement in the past six years. In 2010, only one in ten (13 percent) pregnant women at the same stage of pregnancy said that their family had discussed/decided to deliver at a health facility.
- Discussion/decision about having the delivery at a facility was the highest (38 percent) among women ages 30–34 and the lowest among women ages 35+ (19 percent); it was higher in urban areas (43 percent) than rural areas (22 percent). It was the highest in Khulna Division (42 percent) and the lowest in Mymensingh Division (10 percent) followed by Sylhet Division (15 percent).
- There was positive and strong association between advance discussion/decision to deliver at a health facility and both women’s education and household wealth quintile.

Table 9.2. Pregnant women discussing preparedness for emergency with family members

Percentage of women currently pregnant (in their third trimester) at the time of interview, who had previous discussions with family members on emergency preparedness during pregnancy, Bangladesh 2016				
Background characteristics	Discussed with family members			Number of women
	Make arrangement for blood in case of emergency	Make arrangement for transport in case of emergency	Make arrangement for fund in case of emergency	
Age				
15–19	11.6	16.6	37.9	526
20–24	12.9	17.8	41.0	643
25–29	10.5	17.6	37.5	412
30–34	15.2	21.9	37.3	213
35–39	10.0	23.4	24.7	60
40–44	*	*	*	6
45–49	*	*	*	1
Duration of pregnancy				
7 months	10.1	16.5	31.2	762
8 months	12.0	17.7	41.2	781
9+ months	17.2	23.0	48.2	319
Birth order of current pregnancy¹				
1	14.1	17.8	42.7	750
2–3	12.3	19.4	39.3	899
4–5	4.6	14.6	20.6	166
6+	[4.6]	[10.4]	[12.6]	47
Residence				
Urban	22.3	20.1	46.9	483
Rural	8.6	17.4	35.3	1,379
Division				
Barisal	14.0	16.5	43.6	84
Chittagong	6.8	16.7	35.8	445
Dhaka	21.3	21.5	43.9	497
Khulna	11.8	18.1	35.6	170
Mymensingh	9.0	19.5	33.2	158
Rajshahi	7.0	10.1	33.2	167
Rangpur	8.9	14.6	37.0	204
Sylhet	10.6	24.5	40.2	137
Level of education				
No education	2.9	8.3	14.7	141
Primary incomplete	3.6	10.5	22.9	272
Primary complete	4.9	14.2	26.7	239
Secondary incomplete	10.9	19.1	38.9	806
Secondary complete/higher	27.9	27.0	62.5	404
Wealth quintile				
Lowest	2.2	11.2	21.8	379
Second	4.4	12.6	29.1	401
Middle	7.7	11.3	32.4	345
Fourth	15.8	23.6	44.7	414
Highest	33.5	33.3	67.0	323
Total	12.1	18.1	38.3	1,862

¹ Birth order of the current pregnancy is derived as the sum of the total number of live births plus one.

Figure 9.2. Trends in key indicators of birth planning among pregnant women at the third trimester of pregnancy, BMMS 2010 and 2016



- Birth planning suggestions include the following: arranging funds for delivery or emergency, transport, and a source of blood in case of emergency.
- Almost four in 10 pregnant women in their third trimester mentioned that the family had made arrangements to fund maternal care. In 2010, three out of ten pregnant women reported having done so (Table 9.2; Figure 9.2).
- A much smaller proportion of pregnant women in the third trimester reported that the family had prearranged for transport (18 percent) or blood (12 percent). However, compared to 2010, there was a slight improvement in planning for transport in case of a maternal delivery care emergency.

Table 9.3. Knowledge of maternal complications among pregnant women

Background characteristics	Complications							Number of women
	Symptoms of preeclampsia	Obstructed or prolonged labor	Severe/heavy bleeding	Retained placenta	High fever with smelly discharge	Convulsion /fits	Other symptoms	
Age group								
15–19	42.6	29.9	13.0	22.4	2.3	28.4	30.1	1,622
20–24	48.3	31.6	17.7	27.4	2.5	37.7	34.0	1,924
25–29	46.8	36.6	22.0	27.7	2.8	43.5	35.0	1,304
30+	46.8	35.6	18.5	28.0	3.6	38.8	38.4	739
Trimester								
1st	44.7	32.3	19.4	25.3	2.7	36.2	32.1	1,486
2nd	44.7	33.5	17.1	26.5	2.8	37.9	34.9	2,243
3rd	48.8	32.3	16.2	26.2	2.4	35.1	33.4	1,862
Residence								
Urban	50.6	32.8	18.0	24.0	3.1	37.2	31.9	1,470
Rural	44.5	32.8	17.3	26.8	2.5	36.3	34.3	4,119
Level of education								
No education	38.5	29.3	11.8	26.5	1.7	25.0	25.2	385
Primary incomplete	38.5	32.6	17.4	29.6	3.0	29.0	32.4	819
Primary complete	39.3	34.0	14.1	27.8	2.2	36.9	30.6	771
Secondary incomplete	46.3	30.7	17.0	24.4	2.3	36.0	33.3	2,346
Secondary complete or higher	57.1	37.1	22.1	25.8	3.5	45.6	39.6	1,268
Wealth quintile								
Lowest	41.0	32.9	14.7	29.2	1.6	32.3	33.0	1,137
Second	40.3	30.3	15.5	26.0	2.6	34.9	33.0	1,119
Middle	45.3	33.1	18.5	24.8	3.0	35.0	36.2	1,053
Fourth	47.7	31.6	17.0	26.0	2.6	35.6	34.0	1,227
Highest	56.6	36.5	22.0	24.3	3.4	45.4	32.2	1,054
Total	46.1	32.8	17.4	26.1	2.6	36.5	33.7	5,590

- Pregnant women’s knowledge of maternal complications was categorized into the following types: symptoms of preeclampsia, obstructed or prolonged labor, severe/heavy bleeding, retained placenta, high fever with smelly discharge, convulsions/fits, and others.
- Less than one in two pregnant women had knowledge about symptoms of preeclampsia as a maternal complication. Around one in three pregnant women had knowledge of convulsion or obstructed labor as maternal complications (Table 9.3).
- Knowledge about different types of maternal complications hardly changed by duration of pregnancy.

SECTION 10: KEY FINDINGS

BACKGROUND

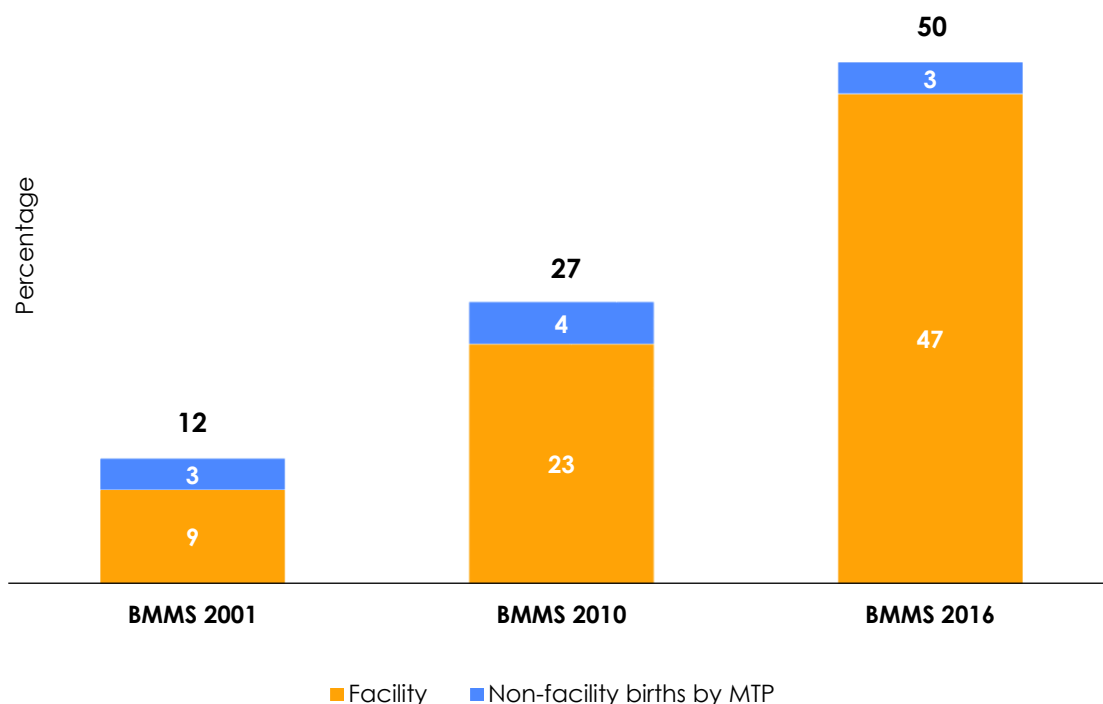
The fourth Health, Population, and Nutrition Sector Programme (HPNSP) for 2017–2022 aims to reach an MMR target of 105 per 100,000 live births by 2022. The 2016 Bangladesh Maternal Mortality and Health Care Survey assesses the recent progress in maternal health and establishes the baseline for the current health sector program and the United Nations' Sustainable Development Goals.

Between BMMS 2001 and BMMS 2010, MMR declined significantly: from 322 to 194 maternal deaths per 100,000 live births. This decline was evidence of remarkable progress linked to fertility reduction; access to qualified maternal health care; increased use of maternal health services in the antenatal, delivery, and postpartum periods; and socioeconomic and infrastructural improvements (Arifeen, et. al, 2014).

KEY FINDINGS OF THE 2016 SURVEY

- **The MMR in Bangladesh declined between 2001 and 2010 but has now stalled.** The MMR estimate from the BMMS 2016 is 196 maternal deaths per 100,000 live births, almost identical to the estimate of BMMS 2010 (Figure 10.2).
- **Bangladesh has made rapid progress in increasing the number of births attended by medically trained attendants.** In 2016, 50 percent of births were attended by medically trained personnel, compared to 27 percent in 2010 (Figure 10.1).
 - **Between 2010 and 2016, more women across Bangladesh delivered their babies in healthcare facilities.** The percentage of births in health facilities increased from 23 percent in BMMS 2010 to 47 percent in BMMS 2016. Now, about 1.46 million births occur in health facilities every year.
 - **The private sector accounted for most of the increase in facility deliveries.** Between BMMS 2010 and 2016, the percentage of deliveries occurring in the public sector facilities increased from 10 percent to 14 percent, while deliveries in private facilities jumped from 11 percent to 29 percent. Births at facilities run by nongovernmental organizations (NGOs) increased from two to four percent. Medically trained attendance for home deliveries has consistently been around three to four percent during 2001–2016.

Figure 10.1. Trends in delivery by medically trained provider and by facility type, 2001–2016



- **Delivery by C-section increased dramatically**, from 12 percent in 2010 to 31 percent in 2016. The current rate means that more than 920,000 deliveries each year are by C-section. In private facilities, C-sections accounted for 83 percent of deliveries, compared to 35 percent in public facilities and 39 percent in facilities run by NGOs.
- **The percentage of women receiving the complete continuum of maternity care** (antenatal care, delivery care, and postnatal care from medically trained providers) **has increased** significantly from five percent in 2001, to 19 percent in 2010, and to 43 percent in 2016.
- **Seeking facility-based care for reported maternal complications has increased.** Although overall care seeking for reported maternal complications remained almost the same between BMMS 2010 (68 percent) and 2016 (67 percent), a much higher proportion of women who reported maternal complications in BMMS 2016 sought facility-based care (46 percent), compared to BMMS 2010 (29 percent).
- **There have been notable improvements in the socioeconomic status of households between 2010 and 2016.** The proportion of respondents who attended secondary school increased from 36 percent to 47 percent between BMMS 2010 and BMMS 2016. Household socioeconomic status—as measured by “access to electricity,” “access to improved toilet,” and “wall materials of dwellings”—shows substantial improvements.

Between BMMS 2010 and BMMS 2016, considerable progress has been made in increasing the utilization of key maternal health services in Bangladesh. Facility deliveries more than doubled in six years and seeking care from facilities for reported maternal complications increased from 29 to 46 percent in that period. However, this behavior has had no apparent impact on MMR.

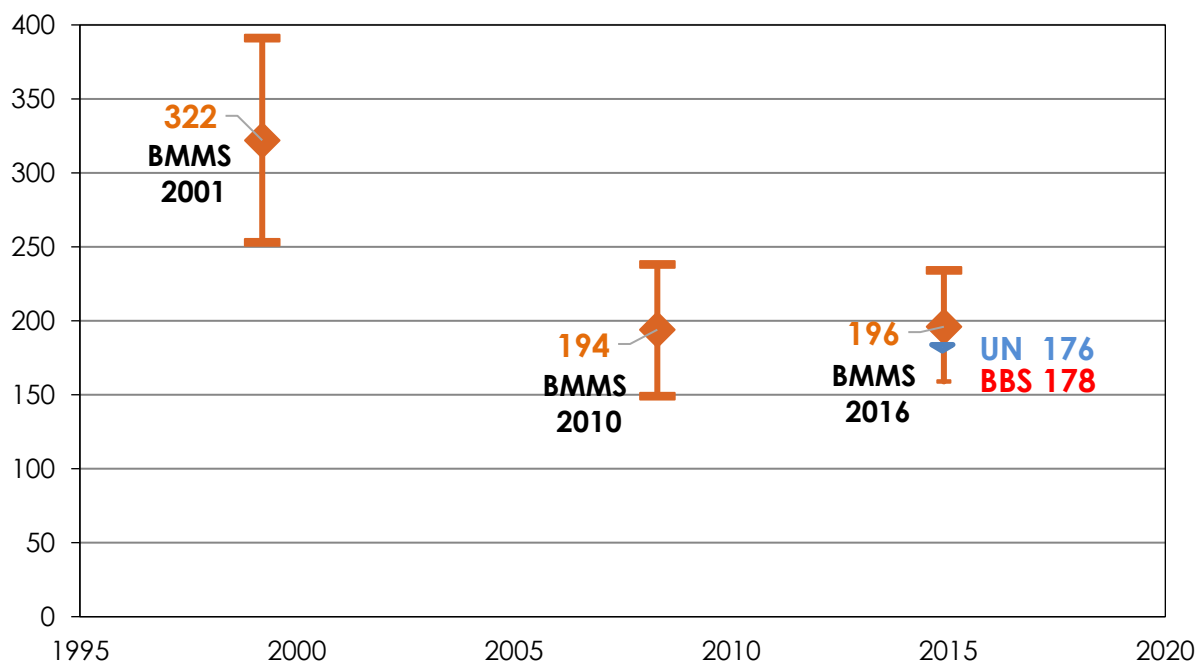
STALLING OF MATERNAL MORTALITY RATIO: POSSIBLE EXPLANATIONS

Many would expect the continued strong progress in coverage of maternal health services to have led to further decline in the MMR in Bangladesh—but it has not. To shed light on this apparent paradox, it is useful to examine the following.

Measurement Aspects

- Typically, underreporting of maternal deaths is more of a concern than overreporting of deaths, and there is no evidence of significant levels of either kind of misreporting. Patterns of deaths by age and socioeconomic variables are consistent with trends observed in the 2001 and 2010 rounds of BMMS. The 2016 BMMS data on births are consistent with other data sources.
- Survey estimates of MMR, like most other estimates, have a margin of error. The margin of error (95 percent confidence interval) for the 2016 BMMS MMR leads to an estimate of 159 to 234. Other recent estimates of MMR in Bangladesh, such as the estimate from the Bangladesh Bureau of Statistics’ Sample Vital Registration System and the United Nations Maternal Mortality Estimation Inter-Agency Group (MMEIG) modeled estimate, are within this margin of error (Bangladesh Bureau of Statistics, 2017) (World Health Organization, 2015) (Figure 10.2).

Figure 10.2. Trends in MMR in Bangladesh from different data sources, 2001–2016

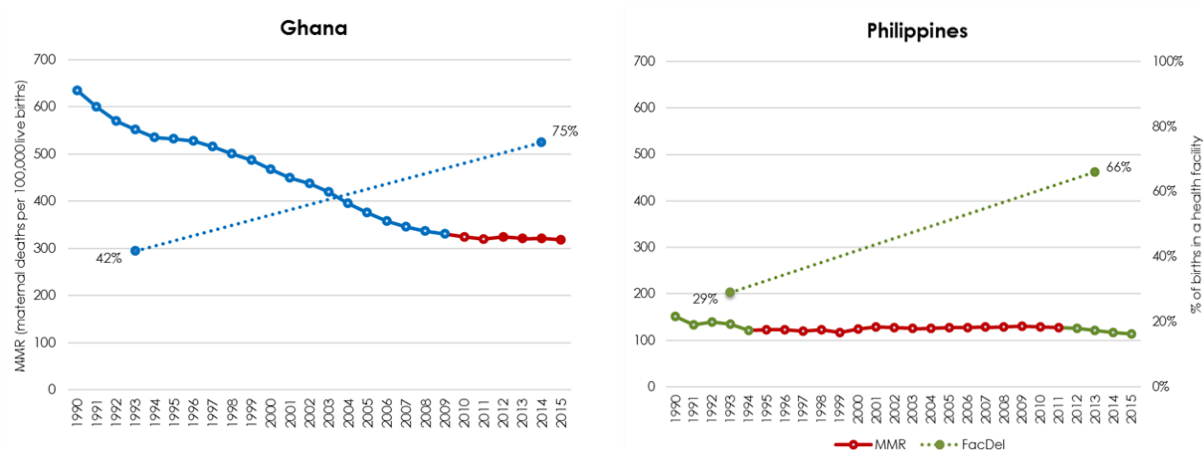


No measurement issues were identified that can explain the apparent stall in MMR between BMMS 2010 and BMMS 2016.

Experience of Other Countries

- An analysis of 37 countries in sub-Saharan Africa and South and Southeast Asia found a weak association between the MMR and the percentage of deliveries occurring in a health facility (World Health Organization, 2014). The association was particularly weak in the nine South and Southeast Asian countries, most of which had an MMR of around 200 per 100,000 live births. It was somewhat stronger in sub-Saharan African countries with higher MMRs. This suggests that a higher level of facility delivery is important but not sufficient to lower MMR across countries.
- There is international precedence for a stall in MMR decline. An analysis of MMEIG estimates of MMR worldwide revealed that 13 of 53 middle-income countries showed stalls in MMR decline. In some of these countries, the apparent stall in MMR occurred despite increases in coverage of medically trained provider and health facility deliveries (for example, Ghana and the Philippines—Figure 10.3). Therefore, Bangladesh is not the only country to experience stalling of MMR with increase in use of maternal health services.

Figure 10.3. Trends in MMR and facility delivery in Ghana and the Philippines, 1990–2015



Between 2011 and 2015 increase in facility delivery had no impact on MMR level in Ghana

MMR level stayed the same in the Philippines though facility delivery nearly doubled during 1995–2012

Bangladesh is not the only country that has experienced the paradox of increasing utilization of maternal services with no impact on MMR.

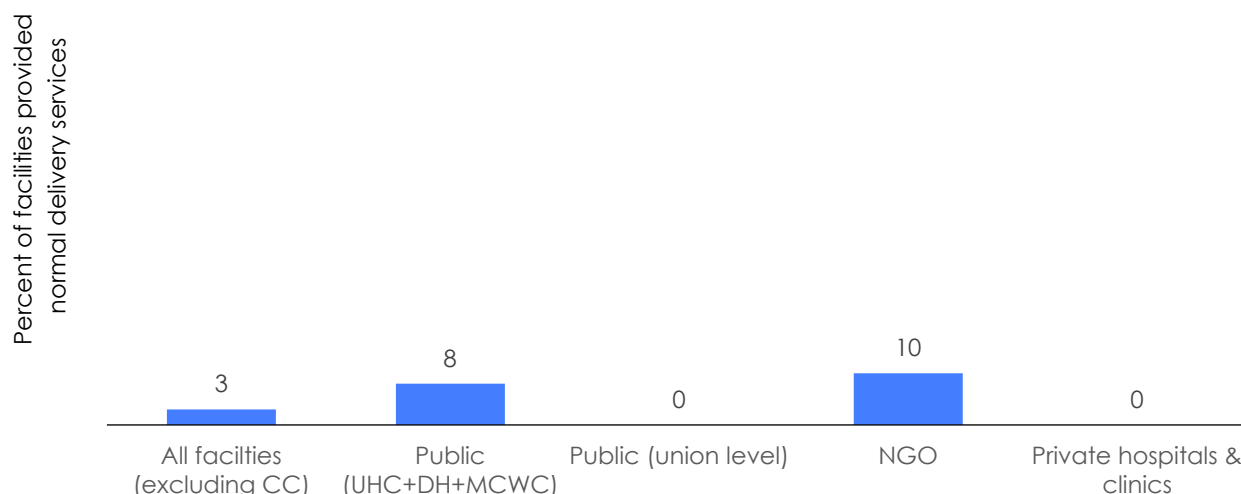
Importance of Quality of Care

- Maternal complications can happen any time (during pregnancy, delivery, or the postpartum period) that require urgent medical attention. Increased coverage of maternal health services is expected to reduce maternal mortality by increasing the likelihood that complications are recognized early and ensuring that women get life-saving medical care should complications arise.
- Several studies in other countries have highlighted the importance of the quality of care in translating use of maternal health services into improved health outcomes.
 1. Analysis of multi-country, cross-sectional data indicates that coverage of interventions needs to be matched with comprehensive emergency obstetric care (CEmOC) and high-quality maternal health services to achieve reductions in maternal mortality (Souza, et. al, 2013).
 2. Evidence from India demonstrates that quality of maternal health services is crucial for the safe motherhood programs to succeed (Randive, San Sebastian, De Costa, & Lindholm, 2014). (Goli & Jaleel, 2014) (Hurst, Semrau, Gawande, & Hirschhorn, 2015) Impact evaluation of two programs in Gujarat and Karnataka also found that low quality of services, coupled with lack of motivation and incentives among the service providers, is the main reason for the programs for not being able to extend healthcare availability and utilization, and reduce maternal mortality (Mohanani, Miller, La Forgia, Shekhar, & Singh, 2016).
- There is consensus that quality of health care is generally poor in Bangladesh. Although there is some qualitative and anecdotal information on quality of maternal care, there is a lack of quantitative data on this topic, with the exception of service readiness data for health facilities and a few small-scale hospital studies.

Readiness and Quality of Maternal Care in Health Facilities

- The 2014 Bangladesh Health Facility Survey (BHFS) (National Institute of Population Research and Training, Associated for Community and Population Health research, and ICF International) provides valuable information on preparedness of health facilities to provide high-quality maternal care. The survey found multiple weaknesses in health system readiness to provide delivery care. For example,
 1. Only 39 percent of facilities that provide normal delivery services had a delivery care provider on call or on site around the clock.
 2. Only three percent of facilities providing delivery care had service readiness¹ to provide normal delivery services (eight percent in higher-level public facilities (district hospitals, maternal and child welfare centers, and UHCs) and zero percent in private hospitals) (Figure 10.4).
- All public facilities at the upazila level and above are designated to provide basic emergency obstetric care (BEmOC) services, but only 36 percent reported performing the seven signal functions for BEmOC. Similarly, 96 percent of the private hospitals were conducting C-section delivery, but only 32 percent provided all seven BEmOC signal functions/services (Figure 10.5).
- A functional referral systems is necessary to ensure effective EmOC service. BMMS 2016 reported that 18 percent of maternal deaths occurred in transit indicating failure in the referral system.

Figure 10.4. Facilities offering normal delivery services having service readiness, BHFS 2014



MCWC: mother and child welfare centre

¹ i.e., having 1. Guideline on BEmOC or CEmOC; 2. At least one staff ever trained in IMPAC at any time; 3. Examination light; 4. Delivery pack; 5. Suction apparatus; 6. Neonatal bag and mask; 7. Partograph; 8. Gloves; 9. Injectable uterotonic oxytocin; 10. Injectable antibiotic; 11. Magnesium sulphate; 12. Skin disinfectant; 13. Intravenous fluids with infusion set.

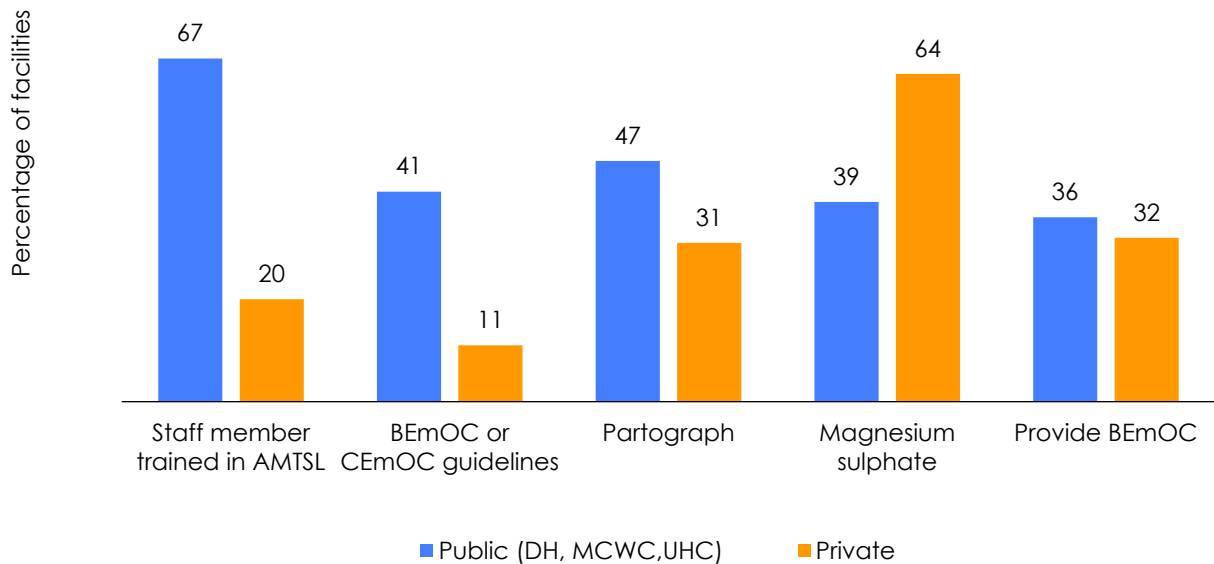
Public Health Sector Performance

- Out of 14 percent deliveries that occur in public health facilities, the upazila and higher-level public facilities handle 13 percent of the deliveries, while only one percent of deliveries take place at unions or community clinics.
- Health systems are weak, even in higher-level public health facilities. In upazila and higher-level public health facilities, 38 percent of physician posts and 19 percent of nurse posts are functionally vacant.
- Among upazila and higher-level facilities that provided normal delivery, there were notable deficiencies in service preparedness (Figure 10.5):
 1. Two-thirds (67 percent) of facilities have a staff person who is trained in active management of the third stage of labor (AMTSL) at any time. Only 20 percent of facilities had a staff trained in AMTSL in the last 24 months.
 2. Only 41 percent have BEmOC or CEmOC guidelines.
 3. Only 47 percent have a blank partograph on site.
 4. Only 39 percent have magnesium sulphate available for managing severe preeclampsia or eclampsia.
 5. All facilities at this level should provide at least BEmOC, but only 36 percent do so.

Private Health Sector Performance

- Private health facilities deliver 29 percent of births; 83 percent of which are by C-section.
- The poorest women are increasingly using the private sector for delivery care. Among the two bottom wealth quintiles, 16 percent of births were in private facilities in BMMS 2016, compared to three percent in BMMS 2010.
- Unfortunately, little is known about the service readiness and/or quality of care provided at these private health facilities. The 2014 BHFS provides information on overall systems and service readiness of private hospitals with 20 or more beds, which is a subset of private-sector health facilities.
- Private hospitals are generally less ready to provide high-quality delivery care compared to public sector UHCs and higher-level public health facilities. Among private hospitals that provide normal deliveries (Figure 10.5),
 1. Only 20 percent have a staff person who is trained in AMTSL at any time. Only seven percent of private facilities have a staff member trained in the past 24 months.
 2. Only 11 percent have BEmOC or CEmOC guidelines.
 3. Only 31 percent have a blank partograph on site.
 4. Nearly two-thirds (64 percent) have magnesium sulphate available.
 5. Only 32 percent provide BEmOC.
 6. There is no information on systems and service readiness for private facilities with fewer than 20 beds, where a substantial number of births occur. Observations and anecdotal information suggest systems readiness and quality of care in smaller private clinics are lower than in the larger hospitals.

Figure 10.5. Facilities with specific items to provide high-quality maternal health care, BHFS 2014



Readiness to Address Obstetric Emergencies

- Only 46 percent of upazila and higher-level public facilities, and 20 percent of private hospitals, had at least one staff member who had ever received training on emergency obstetric care (Figure 10.6). Only 15 percent of higher-level public facilities, and seven percent of private hospitals, had a staff member trained in the past 24 months.
- Thirty percent of public facilities at the upazila level and above perform C-section deliveries, but only 10 percent have comprehensive EmOC services—the WHO recommended nine signal functions. Almost all (96 percent) private hospitals conducted C-sections, but only 16 percent perform the nine signal functions (Figure 10.7).
- The current national standards (Maternal Health Strategy 2017) for a true 24x7 CEmOC facility suggest availability of four pairs of obstetricians and anesthesiologists. Very few facilities other than the medical college hospitals meet the standard.

Figure 10.6. facilities offering normal delivery services have at least one staff trained (ever) on emergency obstetric care, BHFS 2014

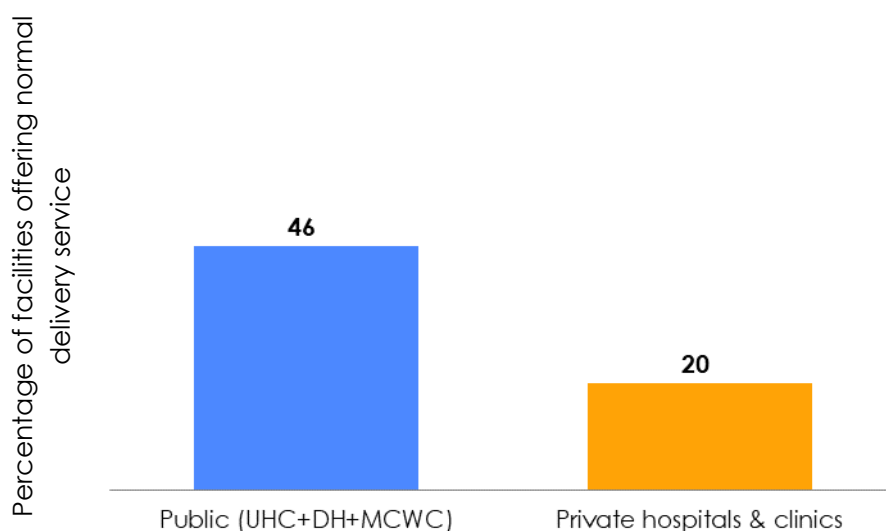
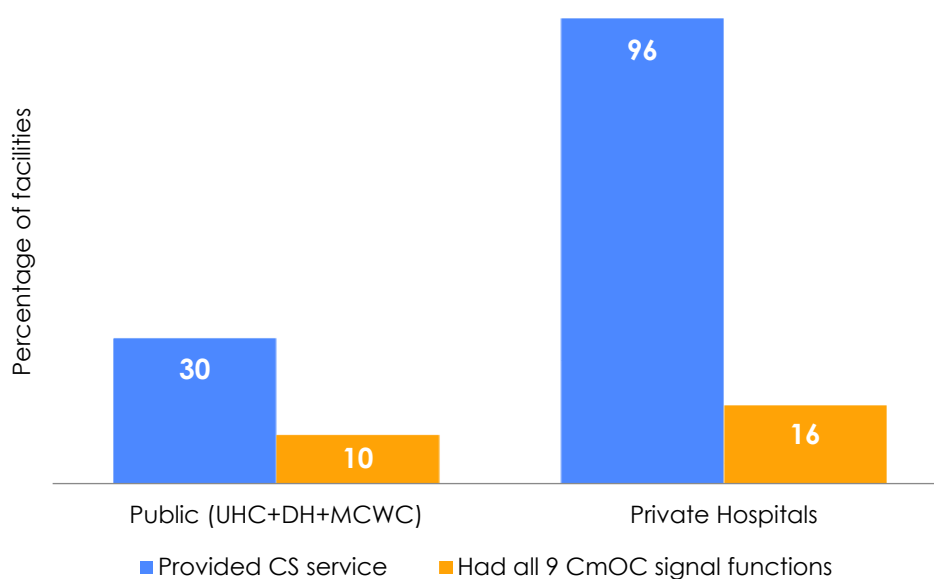


Figure 10.7. Facilities providing C-section and have CEmOC signal functions



- The two main causes of maternal deaths are hemorrhage and eclampsia, accounting for 54 percent of maternal deaths. The readiness of the health system to address these and other complications in maternal health is not sufficient.
1. Just 40 percent of all facilities (excluding community clinics) have supplies of injectable oxytocin to stop hemorrhage, and even fewer (28 percent) have injectable magnesium sulphate to treat eclampsia. Private hospitals are more likely to have these lifesaving commodities (82 percent) than the public sector's facilities at the upazila level and above (64 percent).

2. Injectable antibiotics are available in 69 percent of upazila and higher level public facilities and at 76 percent of private hospitals.
 3. Still, 53 percent of deliveries are occurring at home, mostly without skilled birth attendants. Community distribution of misoprostol for prevention of postpartum hemorrhage only covered about 17 percent of births in Bangladesh during 2015–2016 (Government of Bangladesh, 2016).
- Conservatively, 18 percent of maternal deaths result from or are associated with noncommunicable diseases. Health facilities in Bangladesh are poorly equipped to deal with these cases.

Most of the public and private facilities are not fully ready to provide quality maternity care.

Increase in facility delivery between BMMS 2010 and BMMS 2016 is mostly driven by increase in the private sector; service readiness for maternal care is poorer at private facilities compared to upazila and higher-level public facilities.

Almost one in five maternal deaths occurs in transit, indicating delays in decision making and absence of a functional referral system.

Dangers of Unnecessary C-Sections

- WHO suggests that a reasonable rate of medically necessary C-section is between 10 percent and 15 percent of all births. In Bangladesh, the C-section rate is twice as high (31%) as the WHO-recommended rate. Among the highest quintile, more than half deliver by C-Section.
- Of all C-sections in Bangladesh, 79 percent are in private facilities which accounts for about 2,000 C-sections per day in private facilities. According to BHFS 2014, only 16 percent of private facilities had the nine signal functions for CEmOC while 96 percent reported that they provided C-Section deliveries.
- Although data and research on implications of unnecessary C-Sections in Bangladesh are not available, there are lessons to learn from experiences of other countries.
 1. Increased C-section–related morbidity and mortality have been confirmed by a multi-centre study of 100,000 births in Latin America (Villar, et. al, 2007).
 2. An international multi-centre study showing that women who were submitted for C-section without a clear medical need, presented increased risk of immediate complications, including admission to an intensive care unit, blood transfusion, hysterectomy, and death (Souza, et. al, 2010).
 3. A recent study in Brazil also found that the risk of postpartum maternal death is almost three-fold higher with C-section than vaginal delivery, mainly due to deaths from postpartum hemorrhage and complications of anesthesia (Esteves-Pereira, et. al, 2016).

The prevalence of C-sections is increasing at an alarming rate in Bangladesh, and the level now greatly exceeds the levels expected to be medically necessary. There is convincing evidence that unnecessary C-sections have an adverse effect on maternal morbidity and mortality.

CONCLUSION

Bangladesh has made remarkable progress in increasing demand for and utilization of maternal health services. However, the MMR has stagnated in the past six years, after a significant decline between BMMS 2001 and BMMS 2010. While further research is needed to fully understand this stall in MMR in Bangladesh, there is evidence of substantial deficiencies in the readiness to provide high-quality maternity care in both the public and private sectors. Rates of C-section have increased dramatically and now substantially exceed WHO recommendations, especially in the private sector where most facility deliveries occur. Such high rates of C-section increase the risks to women.

The findings serve as a timely reminder that decreasing maternal mortality requires attention to both demand and supply side factors; maternal deaths will only be prevented if women go to facilities and facilities are fully prepared to handle obstetric emergencies when they occur.

REFERENCES

- Arifeen, S. E., Hill, K., Ahsan, K. Z., Jamil, K., Nahar, Q., & Streatfield, P. K. (2014). Maternal mortality in Bangladesh: a Countdown to 2015 country case study. *The Lancet*, 384(9951), 1366–1374.
- Bangladesh Bureau of Statistics. (2011). Bangladesh Population and Housing Census 2011. Retrieved from <http://catalog.ihnsn.org/index.php/catalog/4376>
- Bangladesh Bureau of Statistics. (2017). Report on Bangladesh Sample Vital Statistics 2016. Statistics and Informatics Division, Ministry of Planning.
- Esteves-Pereira, A. P., Deneux-Tharoux, C., Nakamura-Pereira, M., Saucedo, M., Bouvier-Colle, M. H., & do Carmo Leal, M. (2016). Cesarean delivery and postpartum maternal mortality: a population-based case control study in Brazil. *PLoS One*, 11(4), e0153396.
- Goli, S., & Jaleel, A. C. (2014). What is the cause of the decline in maternal mortality in India? Evidence from time series and cross-sectional analyses. *Journal of Biosocial Science*, 46(3), 351–365.
- Ministry of Health and Family Welfare. (2016). Program Management and Monitoring Unit, Planning Wing, Annual Program Implementation Report: July 2015–June 2016, September 2016.
- Hurst, T. E., Semrau, K., Gawande, A., & Hirschhorn, L. R. (2015). Demand-side interventions for maternal care: evidence of more use, not better outcomes. *BMC pregnancy and childbirth*, 15(1), 297–311.
- Ministry of Health and Family Welfare (MOHFW) (2011). Population and Nutrition Sector Development Program (HPNSDP) 2011–2016. Government of Bangladesh: MOHFW. Retrieved from http://www.mohfw.gov.bd/index.php?option=com_content&view=article&id=166&Itemid=150&lang=en
- Ministry of Health and Family Welfare (MOHFW). (2017). 4th Health, Population and Nutrition Sector Program 2017–2022. Government of Bangladesh: MOHFW.
- Mohanam, M., Miller, G., La Forgia, G., Shekhar, S., & Singh, K. (2016). Improving maternal and child health in India: evaluating demand and supply strategies. 3ie Impact Evaluation Report 30. International Initiative for Impact Evaluation (3ie).
- National Institute of Population Research and Training (NIPORT), Associated for Community and Population Health research (ACPR), and ICF International. 2016. *Bangladesh Health Facility Survey 2014*. Dhaka, Bangladesh: NIPORT, ACPR and ICF International.
- Randive, B., San Sebastian, M., De Costa, A., & Lindholm, L. (2014). Inequalities in institutional delivery uptake and maternal mortality reduction in the context of cash incentive program, Janani Suraksha Yojana: results from nine states in India. *Social Science & Medicine*, 123, 1–6.
- Souza, J. P., Gülmezoglu, A. M., Lumbiganon, P., Laopaiboon, M., Carroli, G., Fawole, B., & Ruyan, P. (2010). Cesarean section without medical indications is associated with an increased risk of adverse short-term maternal outcomes: the 2004-2008 WHO Global Survey on Maternal and Perinatal Health. *BMC Medicine*, 8(1), 71–81.
- Souza, J. P., Gülmezoglu, A. M., Vogel, J., Carroli, G., et al. (2013). Moving beyond essential interventions for reduction of maternal mortality (the WHO Multicountry Survey on Maternal and Newborn Health): a cross-sectional study. *The Lancet*, 381(9879), 1747–1755.
- United Nations, General Assembly. (2015). *Transforming our world: The 2030 agenda for sustainable development*. Resolution adopted by the General Assembly, 70 § 1. Retrieved from http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

United Nations Development Programme (UNDP). (2015) The millennium development goals report 2015. United Nations, UNDP. Retrieved from <http://www.undp.org/content/undp/en/home/librarypage/mdg/the-millennium-development-goals-report-2015.html>

Villar, J., Carroli, G., Zavaleta, N., Donner, A., et al. (2007). Maternal and neonatal individual risks and benefits associated with Cesarean delivery: multicentre prospective study. *BMJ*, 335(7628), 1025–36.

World Health Organization (WHO). (2015). Trends in maternal mortality: 1990 to 2015: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. WHO.

World Health Organization (WHO). (2014). Authors' calculation based on data from: Trends in maternal mortality: 1990 to 2013: Estimates by WHO, UNICEF, UNFPA, the World Bank and the United Nations Population Division. WHO.

APPENDIX

SUMMARY INDICATORS

Indicators	Bangladesh Maternal Mortality and Health Care Survey (BMMS)		
	2001	2010	2016
Maternal Mortality			
Maternal Mortality Ratio (MMR) per 100,000 live births	322	194	196
Pregnancy-related Maternal Mortality Ratio (PrMR) per 100,000 live births	382	201	205
Proportion of adult female deaths due to maternal causes	20.2	14.1	13.1
Antenatal Care (ANC)			
Percentage of last live births in the three years preceding the survey for which women received at least one ANC visit from a medically trained provider	40.1	53.7	74.4
Percentage of last live births in the three years preceding the survey for which women received 4 or more ANC visits	11.6	23.4	37.2
Skilled Assistance at Delivery			
Percentage of births in the three years preceding the survey attended by medically trained provider	12	26.5	49.8
Percentage of births in the three years preceding the survey delivered at a health facility			
All facilities	9.1	23.4	47.1
Public facilities	5.8	10.0	14.3
Private facilities	2.7	11.3	29.2
NGO facilities	0.6	2.0	3.6
Delivery by C-Section			
Percentage of births in the three years preceding the survey delivered by C-section	2.6	12.2	30.7
Postnatal Care			
Percentage of last live births in the three years preceding the survey for which the mother received postnatal care checkup within 2 days of delivery from a medically trained provider	10.6	22.5	48.0
Complete Maternal Care			
Percentage of last live births in the three years preceding the survey for which the mother received at least one ANC visit and delivery care and postnatal care checkup from a medically trained provider	4.8	19.0	43.0
Care Seeking for Complications			
Percentage of last live births in the three years preceding the survey that had complications for which women sought any care	52.7	67.9	67.2
Percentage of last live births in the three years preceding the survey that had complications for which women sought care in a health facility	15.6	28.5	46.0



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