School of Pharmacy and Public Health

Independent University, Bangladesh

Divisional variations of contraceptive use in Bangladesh: An evidence from BDHS 2017-18 data

A thesis submitted by

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Date ……..……...

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Student's Signature

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Recommendation

This is to certify that Naznin Mostary worked on "**Divisional variations of contraceptive use in Bangladesh: An evidence from BDHS 2017-18 data**" under my supervision. I have gone through the paper. It is up to the mark and to my full satisfaction.

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Abstract

Bangladesh is facing an intimidating challenge to achieve the Contraceptive Prevalence Rate (CPR) target of 75% by 2021 as the CPR has remained unchanged at 62% over the past few decades, although the family planning programme of this country was once considered a role model for certain other developing countries. The aim of this research is to examine the variation in CPR among eight administrative divisions of Bangladesh and also to examine the impact of some selected factors on the prevalence of contraceptive use which will help to address the barriers of not using contraception and identify the region or division where extra efforts are needed to increase the CPR. Data on 20,127 currently married women aged 15 - 49 years were drawn from the Bangladesh Demographic and Health Survey (BDHS), 2017-18. Multivariable logistic regression models were considered to estimate the effects of division on contraceptive use after adjusting for related socio-demographic attributes and cultural factors. It is apparent from the study that there were divisional disparities in contraceptive use, more specifically; among women living in Chattogram division had lower odds of contraceptive use than that of Barisal division whereas other divisions had no significant difference in odds of contraceptive use compared to Barisal division. Respondent's age, place of residence, religion, current working status, husband's education, number of living children, number of sons, desire for more children, reading newspapers, watching TV, family planning worker's visit in the last six months were significantly associated with contraceptive use. Special attention should be paid to increase the use of contraceptives in Chattogram division and rural areas by knowing the significant determinants of the contraceptive use, so that the country would be able to reach the Health, Population and Nutrition Sector Development Program (HPNSDP) and Family Planning (FP) 2020 goal of 75% increase of the Contraceptive Prevalence Rate from 62% by 2021.

Keywords: Contraception, Multivariable logistic regression model, Contraceptive prevalence rate, Fertility.

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Abbreviations

BDHS - Bangladesh Demographic and Health Survey

BMI - Body Mass Index

CPR - Contraceptive Prevalence Rate

FP - Family Planning

FPW - Family Planning Worker

HPNSDP - Health,Population and Nutrition Sector Development Program

IUB - Independent University of Bangladesh

MOHFW - Ministry of Health and Family Welfare

NIPORT - National Institute of Population Research and Training

USAID - The U.S Agency for International Development

RStudio - Statistical Data Analysis Software

Chapter I

Introduction

1.1 Background

Contraception is characterized as the use of man-made devices, agents, medications, sexual activities, or surgical procedures to avoid pregnancy or impregnation during sexual activity. The main purpose of these strategies is to prevent sperm from accessing the ovum by using condoms, diaphragms, and other devices, as well as to suppress ovulation and prevent implantation (Hossain et al., 2018). In addition to slowing population growth, there are other benefits to using contraceptives including reducing pregnancy-related health risks and maternal mortality, reducing adverse perinatal outcomes of infants and infant mortality, safeguarding against sexually transmitted diseases (STDs), empowering people and enhancing education (Cleland et al., 2016; Ahmed et al., 2012; Chola et al., 2015; Kost et al., 1991; Stover and Ross, 2010).

The main advantages of using contraceptives can be divided into two levels: micro level and macro level advantages. Contraceptives are effective tools for spacing births and managing family size on a micro level. At the micro level, the advantages of well-spaced childbirth and ideal family size regulation are immense. Improved infrastructure and a lower burden on national budgets are two macro level advantages of well-controlled population growth (Nonvignon and

Novignon, 2014). It was known that, in Bangladesh, almost half of all deaths in women of child-bearing age were caused by problems of pregnancy and childbirth and unsafe abortion (Iskandar et al., 1998). Higher prevalence of contraceptive use could be a cause to improve health benefits of pregnancy spacing for maternal and child health, and reducing maternal morbidity and mortality in Bangladesh. Use of a family planning method helps women avoid unintended and unplanned pregnancies and reduces the risk of unsafe abortions. Contraceptives also help women space the births of their children, which directly benefits the health of both the mother and the infant.

Contraceptive use averts almost 230 million births every year and prevents 2,72,040 maternal deaths worldwide. Rapid reduction of worldwide fertility rates from a total fertility rate of 4.7 births in the early 1970s to 2.6 births in the late 2000s is predominantly attributed to increased contraceptive use (Ahmed et al., 2012). Worldwide, in 2019, 49 per cent of women in the reproductive age range (15-49 years) (a total of 922 million women) were using some form of contraception, an increase from 42 per cent (a total of 554 million women) in 1990. Contraceptive use among women of reproductive age in 2019 was above 55 per cent in 37 countries and below 20 per cent in 23 countries (Bongaarts, 2020).

The use of contraception among women of reproductive age in sub-Saharan Africa increased from 13 per cent in 1990 to 29 per cent in 2019; in Oceania, from 20 to 28 per cent; in Western Asia and Northern Africa, from 26 to 34 per cent; in Central and Southern Asia, from 30 to 42 per cent; and in Latin America and the Caribbean, from 40 to 58 per cent. By 1990, all other regions had already reached a prevalence of contraceptive use greater than 50 per cent, including

Northern America and Europe, where use rose from 57 per cent in 1990 to 58 per cent in 2019; Eastern Asia and South-Eastern Asia, from 51 to 60 per cent; and Australia and New Zealand, from 56 to 58 per cent (Bongaarts, 2020)

Although contraceptive use has increased in many parts of the world, especially in Asia and Latin America, among least-developed countries like the sub-Saharan region it is still low. CPR not only differs among Asian countries but also shows regional disparity in different socio-economic groups within countries like Bangladesh, India and Pakistan. The current prevalence of contraceptive use in Bangladesh (62%) while the prevalence is higher than in other South Asian countries such as India (58%), Nepal (50%), Pakistan (35%) and Afghanistan (23%) (Hossain et al., 2018).

The family planning programs in Bangladesh, which was once considered the role model for developing countries in particular, is facing daunting challenges in achieving the Contraceptive prevalence rate (CPR) target of 75% by 2021. The challenges are even more acute because in some regions of Bangladesh the CPR has been much lower for several decades despite continuous interventions by the Government and Non-Government Organizations (NGOs). Between 1975 and 2014, contraceptive prevalence rate increased from 8% to 62%, and remained at that level thereafter in 2017-18. In our country the effective history of family planning programs led many researchers to examine the determinants of contraceptive use in Bangladesh. In general, the findings of these studies showed that the women's age, education, employment status, wealth index, living in urban areas, husband's education, desire for smaller family size, discussion about family planning with husband, visit of family planning workers within the last

six months, and media exposure were positively associated with contraception use in Bangladesh (Khan, 2003; Kamal and Islam, 2010; Kamal, 2015; Kibria et al., 2016; Hossain et al., 2018; Islam and Haque, 2020).

While many studies have looked at the determinants of contraceptive use, to the best of our knowledge, none of the earlier research has explicitly examined the divisional variations in contraceptive use in Bangladesh based on earlier BDHS 2017-18 report. However, the current use of contraception presents a challenging situation for policy makers to reach the HPNSDP and FP 2020 goal of a 13% increase in contraception use in the next few years. Given the context of high fertility in this region, to meet these goals and show a path to the policy makers, our study seeks to explore the regional variation and other factors such as the socio-economic, demographic and other woman and/or family-related factors that truly affect the use of contraception for currently married 15-49 years aged women in Bangladesh. The aim of this study is to find out whether there is any variation of contraceptive use among eight administrative divisions of Bangladesh, which is responsible for not achieving the targeted goal of 75% CPR by 2021.

1.2 Research Hypothesis

The hypothesis of the study is to explore the divisional variation and to determine the associated factors that have a significant effect on contraceptive use among currently married 15-49 years aged women in Bangladesh based on BDHS 2017-18 data.

1.3 Objective of the Study

Broad objective: The main objective of this study is to examine the divisional variation of contraceptive use in Bangladesh.

Specific Objective

The specific objectives of the study are as follows:

1. To determine the associated factors that have a significant effect on contraceptive use among the currently married Bangladeshi women aged 15-49 years.
2. To address the barriers of not using contraceptive use.
3. Identify the region or division where extra efforts are needed to increase the contraceptive prevalence rate.

Chapter II

Methodology

2.1 Bangladesh Demographic and Health Survey 2017-18

A secondary dataset from the eighth Bangladesh Demographic and Health Survey (BDHS 2017-18) was used for this study. BDHS 2017-18 data provided a wide range of up-to-date information on fertility and childhood mortality levels; fertility preferences; awareness, approval, and use of family planning methods; maternal and child health, including breastfeeding practices, nutrition levels, and newborn care; and community-level data on availability and accessibility of health and family planning services (NIPORT, 2021). The BDHS was conducted under the authority of the National Institute of Population Research and Training (NIPROT) of the Ministry of Health and Family Welfare. The survey was implemented by Miotra and Associates, a Bangladeshi research firm located in Dhaka. ICF International provided technical assistance to the project as part of its international Demographic and Health Survey (DHS) Program. The U.S. Agency for International Development (USAID) provided the financial support. The BDHS 2017-18 dataset was downloaded from the website https://dhsprogram.com.

The total sample size in the 2017-18 BDHS was 20,376 ever married women ages 15-49 years. However finally only 20,127 currently married women ages 15-49 years were selected for this

study. We included only currently married women ages 15-49 years for analysis because considering the nature of the outcome variable of interest (i.e. contraceptive use). Women who were either pregnant or divorced/widowed/separated at the time of the survey were excluded from the study. We also excluded women who mentioned that they had never sex and infertile.

2.2 Dependent and Independent Variables

Using contraception among the respondent or their husband / partner at the time of the survey in 2017-18 was the dependent variable of this study. This variable was grouped into three categories: 1. not using any contraception method; 2. using modern methods (e.g., pill, injectable, condom, female sterilization, male sterilization, IUD, implants, vaginal methods); and 3. using traditional methods of contraception (e.g., periodic abstinence, withdrawal, other traditional methods). The variable on contraceptive use was coded into two categories: yes (indicating the use of either modern and/or traditional methods of contraception) and no, which were coded as 1 and 0 respectively.

The independent variable of the main interest was the eight administrative divisions of Bangladesh, which are Barisal, Chattogram, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur, and Sylhet.

A number of socio-demographic and cultural variables were included in the multivariable analysis, which include age of the respondents, age at the first pregnancy, religion (Islam and others), place of residence (urban and rural), education (no education, primary, secondary, and

higher), wealth Index (poorest, poorer, middle, richer and richest), current working status (working and not working), reading newspaper (yes and no), listening to radio (yes and no), watching television (yes and no), currently breastfeeding (yes and no), husband's education (no education, primary, secondary and higher), family planning workers' visit in the last six months (yes and no), number of living children (0, 1-2, >2), number of sons (0, 1, 2, >2), desire for more child (wants more child, wants no more child and others such as undecided and unsure timing), husbands desire for child (both want the same, husband wants more, husband wants fewer and don't know about husbands desire). We categorized respondent's body mass index (BMI) into four categories: underweight (< 18.50 kg/m2), normal (18.50-24.99 kg/m2), overweight (25.00 - 29.99 kg/m2) and obese (> 30.00 kg/m2).

2.3 Statistical Methodology

Two types of statistical analysis were performed for this study, one was descriptive analysis and another was based on a regression analysis. Through the descriptive statistical analysis we determined the frequency and percentage for categorical variables, and mean and standard deviation (SD) for quantitative variables. Multivariable logistic regression model considered to estimate the effect of division on contraceptive use after adjusting for related factors in terms of odds ratios (ORs). The corresponding estimate, 95% confidence interval (CI) and P-value are also reported in this report. Data processing and analyses were done by using R software.

2.4 Ethical Consideration

We used Bangladesh Demographic and Health Survey (BDHS 2017-18) data; the survey was conducted under the authority of the National Institute of Population Research and Training (NIPORT) of the Ministry of Health and Family Welfare (MOHFW). The data was freely available for academic use. That's why ethical approval for this study was not required. The details of the survey have been described elsewhere (NIPORT, 2021).

Chapter III

Analysis of Data on Contraceptive Use

This chapter is splitted into two sections. In first section (4.1) we are going to analyse the frequencies, percentage, mean and standard deviation (SD) for the descriptive statistics and the second section (4.2) will calculate estimates, odds ratios (OR), 95% confidence interval (CI) and P value for analysis of multivariate logistic regression.

3.1 Descriptive Statistical Analysis

Figure 1 shows that unadjusted prevalence of contraceptive use is higher in Rangpur division (65%), followed by Rajshahi (62%), Khulna (62%), Mymensingh (61%), Dhaka (60%), Barisal (59%), Chattogram (52%) and Sylhet (51%) divisions, respectively. From Table 1, we can see that the overall mean age of the respondent is almost 32 years (± 9.18 years) where the highest mean age is about 32 years (± 9.28) in Khulna division and the lowest is in Chattogram division (about 31 ± 9.09 years). The overall mean age at first birth of the respondent is 18 years (± 3.30 years) and the highest mean age at first birth is 19.24 years (± 3.40) in Sylhet division and the lowest is 17.66 years (± 3.23) in Rangpur division.

Table 1. *Mean and standard deviation (in the parenthesis) of respondent's age and age at first birth by division.*

Variable	Division								
	Overall	Barisal	Chattogram	Dhaka	Khulna	Mymensingh	Rajshahi	Rangpur	Sylhet
Current Age	31.6 (9.18)	31.88 (9.33)	30.95 (9.09)	30.94 (8.93)	32.24 (9.28)	31.23 (9.20)	32.13 (9.39)	31.83 (9.22)	31.74 (8.91)
Age at 1st birth	18.16 (3.30)	18.11 (3.25)	18.11 (2.91)	18.54 (3.54)	18.00 (3.28)	18.03 (3.30)	17.71 (3.18)	17.66 (3.23)	19.24 (3.40)

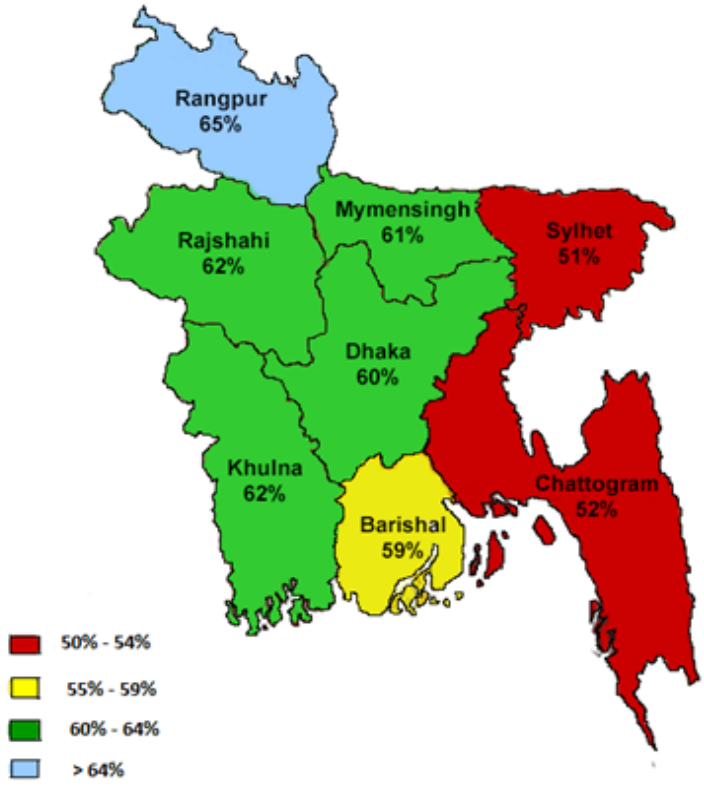

Figure 1. *Percentage distribution of contraceptive use according to divisional variation.*

Table 2. *Frequency Distribution of household characteristics; percentages are in the parenthesis.*

Variable	Division								
	Overall	**Barisal**	**Chattogram**	**Dhaka**	**Khulna**	**Mymensingh**	**Rajshahi**	**Rangpur**	**Sylhet**
Sample size	20,127	2,154 (11)	2,905 (14)	2,974 (15)	2,630 (13)	2,167 (11)	2,576 (13)	2,492 (12)	2,229 (11)
Residence									
Rural	(63)	(68)	(63)	(41)	(64)	(75)	(67)	(70)	(67)
Religion									
Islam	(90)	(94)	(90)	(93)	(86)	(95)	(94)	(85)	(82)
Others	(10)	(6)	(10)	(7)	(14)	(5)	(6)	(15)	(18)
Wealth Index									
Poorest	(19)	(28)	(13)	(7)	(11)	(27)	(18)	(34)	(20)
Poorer	(19)	(21)	(14)	(11)	(20)	(25)	(22)	(24)	(19)
Middle	(19)	(23)	(21)	(15)	(23)	(20)	(23)	(17)	(15)
Richer	(20)	(16)	(21)	(28)	(24)	(16)	(21)	(13)	(20)
Richest	(23)	(12)	(31)	(39)	(23)	(12)	(16)	(12)	(26)

Table 2 shows that about 63% women of the sample are from rural areas. The distribution of place of residence is not the same over different divisions, 75% women of Mymensingh division are from rural areas and only 41% women of Dhaka division are from rural areas. Most of women (90%) are Muslim, which ranges from 82% to 95% over different divisions. From each of five wealth index categories about 23% women are richest and the smallest (7%) and highest (34%) number of poorest women are from Dhaka and Rangpur divisions, respectively.

Table 3. *Frequency distribution of Respondents background characteristics ; percentages are in the parenthesis*

Variable	Division								
	Overall	**Barisal**	**Chattogram**	**Dhaka**	**Khulna**	**Mymensingh**	**Rajshahi**	**Rangpur**	**Sylhet**
Sample size	20,127	2,154 (11)	2,905 (14)	2,974 (15)	2,630 (13)	2,167 (11)	2,576 (13)	2,492 (12)	2,229 (11)
Education									

No education	(16)	(9)	(13)	(16)	(13)	(19)	(18)	(20)	(19)
Primary	(31)	(37)	(28)	(29)	(29)	(34)	(30)	(29)	(39)
Secondary	(39)	(38)	(45)	(39)	(43)	(33)	(39)	(35)	(33)
Higher	(14)	(16)	(14)	(16)	(15)	(14)	(13)	(16)	(9)
Working status									
Yes	(48)	(45)	(35)	(36)	(58)	(56)	(57)	(67)	(32)
Newspaper									
Yes	(11)	(11)	(12)	(13)	(11)	(9)	(9)	(8)	(11)
Radio									
Yes	(5)	(4)	(5)	(7)	(6)	(3)	(5)	(5)	(3)
Television									
Yes	(63)	(46)	(67)	(78)	(72)	(57)	(72)	(57)	(50)
Breastfeeding									
Yes	(21)	(21)	(21)	(19)	(17)	(24)	(18)	(21)	(26)
BMI									
Under-weight	(12)	(11)	(7	(9)	(10)	(17)	(12)	(13)	(19)
Normal	(56)	(56)	(54)	(53)	(53)	(58)	(57)	(60)	(57)
Overweight	(26)	(27)	(30)	(29)	(29)	(21)	(25)	(21)	(20)
Obese	(6)	(6)	(9)	(9)	(8)	(4)	(6)	(6)	(4)

The table of frequency distribution of respondent's background characteristics (Table 3) shows that of the five categories of educational qualifications, most of the women's educational qualifications are secondary level and the overall percentage is about 39 where the highest percentage is found in Chattogram (45%), and the lowest is in Sylhet and Mymensingh division (33%). Overall 48% women are currently working in Bangladesh. Among them the highest percentage of working women lives in Rangpur division (67%) and the lowest in Sylhet division (32%). Overall 63% women watch Television, the highest is found in Dhaka division (78%) and lowest in Barisal division (46%), but most women have no inclination to read newspaper or magazine and listen to radio. Only 21% women are currently breastfeeding mothers and among them maximum are from Sylhet division. About 56% women have normal body mass index and among them highest is from Rangpur division and lowest is from Dhaka and Khulna division.

Table 4. *Frequency and percentage distribution of contraceptive use, husband and child related characteristics.*

Variable	Division								
	Overall	**Barisal**	**Chattogram**	**Dhaka**	**Khulna**	**Mymensingh**	**Rajshahi**	**Rangpur**	**Sylhet**
Sample size	20,127	2,154 (11)	2,905 (14)	2,974 (15)	2,630 (13)	2,167 (11)	2,576 (13)	2,492 (12)	2,229 (11)
Contraceptive Use									
Yes	59	59	52	60	62	61	62	65	51
Contraceptive method									
Non- user	41	41	48	40	38	39	38	35	49
Modern	49	48	43	51	49	53	52	55	42
Traditional	10	11	9	9	12	8	9	10	9
Decision on contraceptive use									
Mainly respondent	15	20	14	15	16	14	13	15	16
Mainly husband	7	8	9	7	6	3	6	8	7
Joint decision	78	72	77	78	78	83	81	76	77
Other	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.1	0
Decision on not using contraceptive									
Mainly respondent	32	32	29	30	35	31	32	34	30
Mainly husband	5	6	7	4	3	2	5	5	5
Joint decision	63	61	64	65	60	67	63	61	64
Other	0.7	0.6	0.5	0.7	2	0	0.3	0.5	1
FP worker visit									
Yes	19	17	17	13	23	27	20	21	15
Total child born									
0	10	9	10	12	10	10	10	8	10
1-2	55	53	48	56	61	52	61	58	47
> 2	35	38	42	32	29	38	29	34	43
Number of living child									
0	10	10	10	13	11	11	10	9	10
1-2	54	53	48	55	61	51	61	57	46
> 2	36	37	42	32	28	38	29	34	44
Number of son									
0	30	29	27	34	32	29	32	29	27
1	40	39	38	40	43	38	43	43	38
2	21	22	23	19	20	23	19	20	22
> 2	9	10	12	7	5	10	6	8	13
Desire for more child									
Wants more	33	32	35	37	31	35	32	29	33
Wants no more	54	57	54	52	57	53	54	56	54
Others	13	11	11	11	12	12	14	15	13
Husband's desire									

Both want same	79	79	80	81	79	78	80	79	74
Husband wants more	11	11	11	10	10	12	10	10	16
Husband wants few	6	7	5	5	6	6	6	9	4
Don't know	4	3	4	4	5	4	4	2	6
Husband's Education									
No education	21	16	16	19	20	26	26	24	24
Primary	31	34	30	31	27	32	31	32	35
Secondary	30	31	37	30	33	25	26	25	28
Higher	18	19	17	20	20	17	17	19	13

Table 4 provides distribution of the respondents according to background characteristics which shows the overall contraceptive prevalence rate (CPR) is 59% where the highest percentage (65%) is in Rangpur division and lowest (51%) in Sylhet division. Among them modern contraceptive users are slightly higher and that is 49%. Decision maker of contraceptive use or not is maximum in the joint decision of husband and wife which is 78% and 63%. Maximum women (81%) reported that they were not visited by family planning workers in the last 6 months. About more than half of women mentioned that they had one or two children as the ideal number of total children ever born and number of living children. Overall 31% of respondent husbands have a primary level of education. Maximum women had only one son and more than half of the total respondents wanted no more children. Maximum husband's desire for more children was the same as their wife's and the percentage was 79.

3.2 Logistic Regression Model

A multivariable logistic regression model was considered in this study to estimate the effect of divisional variation on contraceptive use after adjusting the corresponding independent variables. To develop the final model, i.e. to select independent variables in addition to division for the model, we conducted a thorough review of literature to identify variables that were found to

influence contraceptive use particularly in the context of developing countries. Since the number of obese women were very small, obese and overweight categories of BMI were merged. Due to a large number of missing observations, we have omitted four variables (husband's desire for more children, total children ever born, decision maker for using contraceptives, and decision maker for not using contraceptives) from this model. Table 5 represents the estimate, odds ratio, 95% confidence interval and p-value corresponding to the parameters of the logistic regression model considered for analyzing contraceptive use.

Table 5. *Estimate, OR and 95% Confidence Interval of the parameters of logistic regression model*

Variables	Estimate	OR	95% CI	P-value
Division				
Barisal				
Chattogram	-0.349	0.705	0.540 - 0.913	0.049
Dhaka	0.158	1.170	0.970 - 1.50	0.367
Khulna	0.048	1.050	0.802 - 1.370	0.367
Mymensingh	0.327	1.390	1.010 - 1.910	0.135
Rajshahi	0.046	1.050	0.795 - 1.38	0.367
Rangpur	-0.016	0.983	0.742 - 1.30	0.367
Sylhet	-0.304	0.738	0.556 - 0.980	0.135
Place of residence				
Urban				
Rural	-0.250	0.779	0.609 - 0.995	0.135
Religion				
Other				
Islam	-0.509	0.601	0.526 - 0.687	< 0.001
Education level				
No education				
Primary	0.103	1.110	0.979 - 1.250	0.367
Secondary	0.075	1.080	0.940 - 1.240	0.367
Higher	0.213	1.240	1.020 - 1.50	0.135
Wealth index				
Poorest				
Poorer	0.037	1.040	0.919 - 1.170	0.367
Middle	-0.130	0.878	0.771 - 0.999	0.135
Richer	-0.056	0.945	0.823 - 1.090	0.367
Richest	-0.075	0.927	0.789 - 1.090	0.367

Age	-0.035	0.965	0.958 - 0.972	< 0.001
Age at 1st pregnancy	-0.005	0.994	0.981 - 1.010	0.367
BMI				
Normal				
Overweight	-0.047	0.953	0.877 - 1.040	0.367
Underweight	-0.066	0.936	0.829 - 1.060	0.367
Currently working				
No				
Yes	0.319	1.380	1.270 - 1.490	< 0.001
Breastfeeding				
No				
Yes	-0.000	0.999	0.905 - 1.10	0.367
Husband's education				
No Education				
Primary	-0.027	0.973	0.872 - 1.080	0.367
Secondary	-0.160	0.852	0.755 - 0.961	0.049
Higher	0.061	1.060	0.906 - 1.250	0.367
Visited by FP worker				
No				
Yes	0.784	2.190	1.990 - 2.410	< 0.001
Reading newspaper				
No				
Yes	0.214	1.240	1.080 - 1.430	0.049
Listening to radio				
No				
Yes	0.018	1.020	0.846 - 1.230	0.367
Watching television				
No				
Yes	0.124	1.130	1.040 - 1.240	0.049
Number of child				
0				
1-2	2.370	10.70	5.250 - 21.80	< 0.001
> 2	2.650	14.20	6.90 - 29.20	< 0.001
Number of son				
0				
1	0.242	1.270	1.160 - 1.40	< 0.001

2	0.441	1.550	1.380 - 1.750	< 0.001
> 2	0.317	1.370	1.160 - 1.620	0.018
Desire for child				
Wants no more				
Wants more	-0.671	0.511	0.462 - 0.565	< 0.001
Others	-0.914	0.401	0.318 - 0.505	< 0.001

It is seen from Table 5 that there is a significant difference in prevalence of contraceptive use among women of different divisions, as the odds of contraceptive use for women of Chattogram division is about 29.5% lower than that of Barisal division and the decrease in odds is statistically significant ($p< 0.05$). There is no significant difference in odds of contraceptive use for women of Barisal and other divisions. In addition, women living in rural areas were found to have 22 percent [95% CI: 0.609 - 0.995] lower odds of contraceptive use compared to their counterparts living in urban areas. For one-year increase of age, the odds of using contraceptives is lowered by 3.5% ($p < .001$), which showed that age is a significant factor associated with the use of contraceptives in women of Bangladesh. The followers of Islam were less likely to use contraceptives compared to followers of other religions (OR:0.60) and the difference is statistically significant ($p < 0.001$). The women who were currently working, received a family planning worker's visit in the last six months, watched television and read newspaper had significantly higher odds of using contraception compared to corresponding reference categories. Women whose husbands had secondary level of education were less likely to use contraceptives. The respondents of the study who had no children and did not have a son had statistically significant lower odds of using contraception compared to the respondents who had more than 1 child or a son. The woman who desired more children and who were in the others category (undecided or unsure timing about having more children) had lower odds of using contraceptive

(48.9% and 60% respectively) than the women who were not interested about having more children and the decrease in odds is statistically significant ($p < 0.001$). On the other hand there were no significant effects of other covariates considered in the model, e.g. women education, wealth index, age at first birth, BMI, current breastfeeding status and whether listening to radio.

Chapter IV

Discussion

According to the BDHS 2017-18 reports, contraceptive prevalence rate (CPR) was 62%. (NIPORT, 2019), which was a weighted estimate. However, we found that the unweighted CPR is 59%. In the BDHS report, women who were currently not in any marital relationship (divorced/widowed/separated), pregnant, had never sex, infertile or sexually inactive were not excluded to calculate CPR. After excluding, we found that CPR is 59%.

The purpose of this study was to examine the divisional diversity in the use of contraceptives in Bangladesh and to examine the extent of the differences. Since our goal is not estimating division-specific prevalence of contraceptive use, rather comparing prevalence of contraceptive use among divisions, sampling weights are not used in the analysis. We hypothesized that there would be no significant difference in the use of contraceptives among divisions in Bangladesh. Contrary to expectations, it was found that after adjusting for related covariates, there were significant divisional variations in contraceptive use in Bangladesh, more specifically; among women living in Chattogram division had lower odds of contraceptive use than that of Barisal division whereas other divisions had no significant difference in odds of contraceptive use compared to Barisal division. Previous research revealed that CPR was lower in Chattogram and Sylhet than other divisions when Bangladesh was divided into seven divisions (Islam and Haque, 2020). Thus the findings of the study shows that the Chattogram division, which lags behind

other divisions of Bangladesh in terms of contraceptive use, needs a pragmatic approach to family planning programs to increase the rate of contraceptive use.

In order to increase the CPR, family planning programmes in Bangladesh should place more emphasis on providing family planning services and emphasis should be placed on allocating more resources in rural areas than in urban areas in general. Consistent with other research we also found that rural women were less likely to use contraceptive compared to urban women (Kamal and Islam, 2010; Kamal, 2015; Kibria et al., 2016; Islam and Haque, 2020).

The use of contraception also varies with religious belief where belief about family planning and other cultural trends can decrease the prevalence of contraception use (Srikanthan and Reid, 2008). For example, abortion of a viable fetus is considered a serious crime equivalent to that of murder in Islam while emergency contraception is also disapproved of (Srikanthan and Reid, 2008), which causes less prevalence of contraception use by Muslim women. Among studies and analysis in some other research articles, it was said that religion did not have any significant effect on contraceptive use though some articles highlighted impact of religion on contraceptive use (Kamal and Islam, 2010; Islam et al., 2010; Sahu and Hutter, 2012). We found significant variation in contraception use according to religion: Muslim women were 40% less likely to use contraception than non-Muslim women.

Women's age was significantly associated with contraception. The finding of this analysis was that women were less likely to use contraceptives with increasing age when other factors were taken into account which was also the same as some previous research (Kibria et al., 2016).

Although high levels of contraceptive use in young women are generally attributed to their unwillingness to have children, the decline in current use of contraception in older women is generally attributed to their declining fecundity (Goni and Rahman, 2012). This is also due to the fact that at older age women were less interested to use contraceptives due to menopause onset, health concern, misconception about long time use of contraceptives and not having frequent sex (Moreira et al., 2019; Islam, 2016; Monteith et al., 1985).

Another effective indirect strategy to significantly reduce divisional disparities in contraceptive use may be to increase women's employment in Bangladesh. This is supported by the findings of this study that women who are currently working had higher rates of contraceptive use compared to unemployed. This finding is also consistent with earlier research (Deb and Kawsar, 2011; Islam and Haque, 2020). This study, in agreement with other studies, elucidates that women who have been exposed to modern approaches such as reading newspaper, watching television are more likely to use contraceptives.

Our results support findings from several other studies that show that women who had a family planning worker's visit in the last six months had the highest impact on contraceptive use (Kamal and Islam, 2010; Kamal, 2015; Kibria et al., 2016; Islam and Haque, 2020). This is an encouraging result which has implications on promising future trends of family planning utilization. The best use of family planning resources should be focused on providing accessible and high quality services and reaching out to couples through motivational campaigns, interpersonal and community based communication by the help of family planning workers.

On the other hand we found that women's education, wealth index, age at first birth, BMI, current breastfeeding status and whether listening to radio did not have any significant association with contraceptive use when they were adjusted for other factors. This finding is important as previous studies revealed that these factors have association with use of contraceptives (Kamal and Islam, 2010; Lethbridge, 1990; Jacobsen and Lund, 1990; Dias and de Oliveira, 2015; Khan, 2003). We didn't find the positive effect of husband's education on contraceptive use in this study when other factors were taken into account (Islam and Haque, 2020).

As previous studies, desire for more children and son has major impact on contraceptive use (Kamal and Islam, 2010; Kamal, 2015; Islam et al., 2010; Sahu and hutter, 2012), our study also showed that the respondents who had no children and did not have a son had statistically significant lower odds of using contraception compared to the respondents who had more than 1 child or a son. Women who desired for having more children were less likely to use contraceptives. From these results we can conclude that in order to increase the rate of contraceptive use, we need to eliminate gender inequality in Bangladesh by changing the attitude towards son and daughter. Similarly raising public awareness about the benefits of having a small family will help to have a strong positive impact on increasing the CPR in Bangladesh.

However, some limitations of this study should be noted. First of all , the study sample that was used for analysis is representative. Second, researchers didn't have any control in data collection procedure. And finally, this study included only currently married women. So, women who were divorced, widowed or unmarried but may have sexual exposure were not included. Despite these

limitations, this study provides new insights about the extent of divisional variations of contraceptive use in Bangladesh which will provide better insights for future researchers, program planners and policy makers to achieve the desired goal by reducing the divisional disparity in contraceptive use.

Chapter V

Conclusion

The study results clearly indicate that, despite the government's serious commitment to achieve 75% of the contraceptive prevalence rate by 2021, it is still far below than the acceptable standard among the eight administrative divisions of Bangladesh in order to achieve the lower replacement level of fertility. The challenges are even more serious because Bangladesh has been passing through a critical phase of fertility transition, in which the level of total fertility appears to be unchanged at a level of 2.3 with contraceptive prevalence rate almost 62% (since there is no significant difference between 61% and 62%), as observed from the BDHS 2011, 2014, and 2017 results. The Government of Bangladesh needs to address the factors that need to be intervened on the priority basis to address the inequality of contraceptive use in all the divisions of the country in order to scale up the contraceptive prevalence rate and achieve the target of Sustainable Development Goals (SDG). However the findings of this study have several implications. First of all, increasing not only women's education but also providing employment opportunities for women is important to increase uptake of contraception. Secondly, increasing interest in media exposure, encouraging Islamic leaders to openly campaign in favor of contraception methods and regular personal counseling and community conversations through home visits by family planning workers can help to increase contraceptive utilization. Thirdly, raising public awareness about the benefits of having a small family and eliminating gender

inequality by changing the attitude towards son and daughter can also help to increase contraceptive use. Finally, those who live in rural areas and Chattogram divisions should be targeted for scaling up and tailored services to increase the standard of life styles of their population.

Although the findings of this study simplify the acclimatization to a national approach to increasing contraceptive use in the backward divisions of the country, unidentified barriers and reasons behind the low rate of contraceptive use need to be uncovered or identified through more in-depth analysis separately in each division of Bangladesh in the future, which will provide clear insights for programme planners and policy makers.

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