

Drivers of unwanted births in Bangladesh (2004 – 2014): A decomposition analysis

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Abstract

Background In Bangladesh, about 30 percent of the total births a woman on average have (2.3 births) are unwanted. Reduction in unwanted births is very important for family wellbeing, and control of rapid population growth. This reduction requires in-depth knowledge about the factors associated with the change in unwanted childbearing. This study examines the contributions of population structure, external factors that is family planning programmes, and their interaction to the change in the proportion of women having unwanted birth during 2004 – 2007, 2007 – 2011 and 2011 – 2014. Methods This study uses the notion of standardization approach for measuring the effects of family planning programmes and non-programme factors on unwanted childbearing. Using Bangladesh Demographic and Health Survey data, we employ both aggregate and detailed three-fold decomposition technique to decompose the changes in the proportion having unwanted birth into the contributions of the three different factors. In decomposing the changes, we use logistic regression estimates. Results About 10.3 percent women are found to have unwanted birth in 2014. This percentage remains almost unchanged during 2004–2007, but declines significantly during 2007–2011 and 2011–2014. Population structure exerts significant reducing effect on proportion having unwanted birth during all the study periods, while external factors exerts significant negative effect only during 2011–2014. Interaction effect is found non-significant during all the study periods. All the factors found significantly associated with unwanted childbearing in logistic regression analysis do not show significant effect on its changes in detailed decomposition analysis. Structural effects of respondent's age at marriage and education are found significantly negative during all the study periods. Conclusions In Bangladesh, significant reducing effect of population structure amid non-declining family planning programmes reduces the proportion having unwanted birth, while simultaneous reducing effects of structure and family planning programmes during a period result in a more pronounced decline. Substantial decline in women marrying before age 18 and having no education is likely to play a vital role in resulting a population structure that may have significant reducing effect on the proportion having unwanted birth.

Introduction

Unwanted births have negative consequences for mother and child health, family relationship and control of burgeoning population [1]. Actual births that are excess over the desired number of births of a woman is usually known as unwanted birth. Although the share of unwanted births in average total fertility per woman in Bangladesh shows a steady decline, the share is persistently high. In Bangladesh, about 30 percent of the total births a woman on average have (2.3 births) are unwanted. The share of unwanted childbearing in Bangladesh ranges from 1.3 births out of 3.4 births per woman in 1993/1994 to 0.7 births out of 2.3 births per woman in 2014 [2]. While unplanned pregnancies and unwanted births in United States together increase total births per woman by only 10 – 15 percent [3]. Nonetheless, the unwanted childbearing, however, can be reduced almost to zero, which was evident in Maldives in 2017 when the country's total births per woman was 1.9 [4]. Reduction of unwanted childbearing is very important for family wellbeing, and continuous fertility decline to control rapid population growth in Bangladesh [5]. Reduction in unwanted childbearing requires in-depth knowledge about the factors that are associated with the change in unwanted childbearing. This requirement leads this study to explore the answer of the question – what are the drivers of changes in the proportion of women experiencing unwanted birth in Bangladesh during the period 2004 – 2014? This study intends to answer this question by examining the effects of the change in population structure (or characteristics), change in behavioral response to the predictors that is the changes in external factors (such as family planning (FP) programme activities) other than those included in the analysis, and interaction effect of those two types of changes.

Background Of The Study

Unwanted childbearing is of a serious concern to the health workers, demographers and sociologists. It is directly associated with poor physical and mental health of mother and child, low quality relationship among parents and children, and rapid population growth [1]. The rampant growth of the vast population of Bangladesh significantly contributes to its multifarious socioeconomic and environmental problems, such as widespread unemployment, extensive poverty, and environmental pollution [6, 7]. Currently Bangladesh is the eighth-most populous country in the world and most crowded in South Asia [8]. Prevention of unwanted childbearing would also help reduce the fertility further, which in turn would help control the population growth in Bangladesh and would enable the government to manage the existing socioeconomic and environmental problems more efficiently at an earlier stage [9]. In-depth knowledge about the drivers of the change in unwanted births is required to prevent them.

Studies on unintended childbearing in different countries excluding Bangladesh show that unintended childbearing is significantly associated with marital status, younger ages of child birth, number of previous births, employment status, household-income status, region, urban-rural residence, slum settlement, ethnicity, and failure of contraception – mainly withdrawal method [10–12]. Although none of these studies found any significant association between unintended childbearing, and level of education and household wealth possession, some other studies, however, found a significant relationship between them [13–15].

Studies that analysed unwanted childbearing in Bangladesh show that women's current age, marriage at an younger age, religion, low educational attainment by women, exposure to mass-media, husband's desire for more children, and unmet need for FP exerts significant influence on unwanted childbearing [16, 17]. Besides these, studies on unintended pregnancy in Bangladesh cited that wealth status, current age, parity, age at marriage, religion, media access and contraceptive use exert significant effect on unintended pregnancy [18, 19].

From the above discussion, it is apparent that studies on unintended childbearing have ended up with mixed results. Existing studies mainly focused on unintended childbearing and very few of these analysed unwanted birth. Birth data of Bangladesh Demographic and Health Surveys (BDHSs) show that 3.3 percent, 2.9 percent, 2.4 percent and 0.5 percent births, respectively, in 2004, 2007, 2011 and 2014 result from the pregnancies that were reported wanted by the mothers were explained as unwanted later when the mothers were asked about that birth. This change in labelling could be due to the fact that either mothers adjust to the reality of a new birth or are unwilling to explain a child as having initially been unwanted [20]. This explanation indicates that unintended pregnancies, mistimed births and unwanted births are separate entities, and classifications of unwanted births are more accurate than that of unintended pregnancies. Findings of D'Angelo, Gilbert, Rochat, Santelli, and Herold (2004) show that the determinants of unintended pregnancies, mistimed births and

unwanted births are not exactly the same [21]. Although occurrence of a birth that is desired later is subject to social and policy context [22], a mistimed birth is primarily assumed to occur later, but an unwanted birth is never supposed to happen. Therefore, prevention of unwanted birth can definitely be more helpful in reining in a burgeoning population. Besides these, existing studies mainly provide idea about the characteristics of women that are significantly associated with unintended childbearing in a period; these studies provide almost no information on the effects of changes in the characteristics of female population and changes in their behavioral responses (resulting from external factors that is FP programme activities other than from the changes in population structure) over a period on the change in unwanted or mistimed childbearing during that period. Therefore, designing FP programme targeting the women of a particular characteristic that was found significantly associated with unintended childbearing in a period may not be feasible and effective in reducing unintended childbearing if the number of women with that characteristic become extremely low and if influence of FP programme reaches to its endpoint at which change in the number of women with a particular characteristic becomes indispensable for implementing their reproductive preferences by using existing FP services. Along with these, to date, no study is found to systematically analyze the drivers of changes in unwanted childbearing in Bangladesh over time.

Analysis of the current study is designed by keeping the weaknesses of the existing studies in view. This study examines the effects of the changes in population structure (that is population characteristics), changes in behavioral response to the predictors of unwanted birth (that is the changes in external factors such as FP programme activities), and interaction of these two on the change in the proportion of women having unwanted birth during the period 2004 – 2014. Activities of other external factors such as political commitment, and other interventions and campaigns that intend to influence population matters also reflect through FP programme activities. In investigating the effects of different factors, current study employs decomposition analysis using the notion of standardization approach of measuring the effect of FP programmes on fertility [23]. Findings of this study would be helpful in drawing line among the relative importance of changes in population characteristics, FP programme activities, and their interaction in reducing unwanted births in Bangladesh. Important FP programme activities in Bangladesh include the provision of FP counselling and contraception at doorstep, and provision of FP services at union (comprises nine wards or villages) level through the Union Health and Family Welfare Centres [9]. Therefore, findings of this study can be helpful in formulating an appropriate policy that would be very effective in preventing unwanted births.

Materials And Methods

Data

This study is based on the data of four BDHSs conducted in 2004, 2007, 2011 and 2014 under Demographic and Health Survey (DHS) programme. National and international organisations consider BDHSs the most reliable sources of demographic data of Bangladesh [24]. DHS programme has earned worldwide reputation for collecting and disseminating accurate and nationally representative data. This programme has assisted more than 400 surveys in over 90 countries [25].

BDHSs of 2004, 2007, 2011 and 2014, respectively, interviewed a total of 11,440, 10,996, 17,842, and 17,863 ever-married women. A woman was included in the analysis if she gave at least one birth during the five-year period before each BDHS and also if the wantedness of that birth was recorded. A total of 5,366, 4,925, 7,325, 4,493 cases, respectively, in the surveys of 2004, 2007, 2011 and 2014 are found to give at least one birth in past five-year of the surveys and also the wantedness of their last child during that period was recorded. Cases with missing information for any of the selected predictors were excluded from the analysis. Numbers of cases with such missing information in all the selected surveys were extremely small and therefore did not show any noticeable impact on the results of analysis and comparison over time. Finally, 5,366, 4,920, 7,325, and 4,491 cases, respectively, from 2004, 2007, 2011 and 2014 surveys were selected for analysis.

Analytical framework for analysing unwanted childbearing

Analysis of this study is guided by an analytical framework developed using causal relationship of unwanted birth with different factors. This framework is primarily based on the premise that some demographic and behavioral processes enhance the actual number of births of a woman above the number she desires, which is known as unwanted birth. These demographic and behavioral processes are further influenced by some socioeconomic factors and programme factors (those related to FP programme). Socioeconomic development reduces the demand for children and increases the demand for birth control (contraception and induced abortion) to limit births. FP programmes increase the ability of using birth control by reducing its monetary and social costs [26]. Unwanted births primarily occur when the increase in the use of birth control is insufficiently rapid to prevent the unwanted births resulting from the decline in desired family size. Main reasons for this non-use of birth control can be child replacement (because of child mortality), sex preferences, lack of access to FP services, inability of women to implement their reproductive preferences because of the opposition of husband or others, and unavailability of birth control [27]. Besides these, unwanted birth may also result from contraceptive failure that largely depends upon the quality of FP programmes [11, 17]. There are some other socioeconomic factors that also exert strong influence on unwanted birth through some of the aforementioned factors. For example, overall improvement in women education and their increased participation in labour force may reduce the occurrences of unwanted birth by increasing their ability of using and acceptability of birth control [28].

Using the analytical framework developed here, this study analyses as many predictors as is possible with the available data from the BDHSs. Among the impacts that are important in studying unwanted birth, measurement of the impact of programme factors is extremely difficult [29]. Current study measures the impact of programme factors on unwanted birth by assuming that the unexplained part of the total change in the proportion of women having unwanted birth that is measured using decomposition analysis is essentially the effect of programme factors.

Variables

The dependent variable of this article is the status of having unwanted birth in five-year period before the study surveys. Here a birth of a woman is classified as unwanted if the order of that birth is higher than the ideal or desired number of children of that woman. As a mother may not want to directly report a birth as unwanted, this indirect technique of identification provides a filter by relieving mothers from directly reporting a birth as unwanted. The number of children a woman would like to have if she could start family/partnership afresh has been considered as her desired number of children. One important fact is that if a woman is asked about her desired family size, she may have difficulty revealing her desire for smaller family and may in fact report her actual number of children as her desired number. Despite this tendency of adjustment, substantial number of women with larger family in all the included surveys are found to report a smaller desired family size than their actual family size [2, 30–32].

Selection of independent variables for the analysis is guided by the adopted analytical framework, existing studies, analysis technique and availability of data. As the analysis was based on four rounds of BDHS data, a variable was included in the analysis only if that was defined in the same way in all the surveys in order to ensure proper inter-survey comparability. The independent variables included in the analysis are respondent's current age, age at marriage, education, current work status, religion, residence, socioeconomic status, children's sex preferences, and experience of child death. Respondent's education was classified into four groups from the perspective of Bangladesh; these are no education (if five-year of schooling is not completed), primary (if five to nine-year of schooling is completed), secondary (if 10 to 11-year of schooling is completed) and higher education (if 12 or more years of schooling is completed). Religion was classified into two categories – Muslim and non-Muslim; the non-Muslim category includes Hindu, Buddhist, Christian and Others. Socioeconomic status of a respondent was determined using her household wealth index values that were directly provided by the BDHS data. Values of the wealth index were divided into three equal groups. Finally, the socioeconomic status of the respondents in the highest, middle and lowest wealth terciles were, respectively, classified as high, medium and low.

Analytical techniques

This study analyses data using descriptive and multivariate techniques. Measuring the effect of FP programmes on fertility is recognized as a difficult task because of two reasons: i) the measurement of the level of a FP programme operation requires wide variety of information from different functional areas of the programme with additional information from socioeconomic, political and cultural areas; many of these information are usually unavailable, especially in developing countries, and ii) complex and masked relationships between fertility and its determinants [23, 33]. As fertility may change because of the effects of both programme and non-programme factors, the key question arises is what part of that change can be ascribed to programme factors? Therefore, a method can be considered ideal if that can account separately for programme and non-programme effects on fertility. Considering the fact of data availability and the criterion of an ideal method, this study uses the notion of standardization approach [23] that has been suggested by the United Nations for measuring the effects of FP programmes and non-programme factors on the change in the proportion of women with unwanted birth. The rationale of using standardization approach can briefly be summarized as follows.

Using the notion of standardization approach, the observed change (if any) in a proportion during a period can be accounted for by standardizing various non-programme factors that may affect observed proportion without reflecting a genuine change in that proportion. This standardization explains part of the observed change in that proportion; all or part of the residual changes (that are not explained by the standardized factors) can then be attributed to FP programme on the basis of reasonable assumptions and evidence. Standardization approach can appropriately be applied using decomposition analysis technique. In using this approach, the factors that will be standardized should be selected carefully because of the difficulties of identifying the non-programme factors that have association with fertility. Analysis in this study includes as many non-programme factors as is possible with available data in the light of adopted analytical framework and existing literature. The multivariate techniques – binary logistic regression and decomposition analysis – have primarily been used to measure the effect of FP programme using the notion of standardization approach.

Binary logistic regression was used to estimate the odds of experiencing unwanted birth. The response variable was binary coded as '1' if a respondent's last birth in five-year period before a survey was unwanted, and '0' otherwise.

A three-fold decomposition technique has been used here to identify the contribution of group differences in predictors to the overall difference in the predicted proportion of women with unwanted birth (outcome difference) during the study periods 2004 – 2007, 2007 – 2011, and 2011 – 2014. This study performs both aggregate and detailed decomposition. Using the principle of the decomposition technique developed by Blinder (1973) [34] and Oaxaca (1973) [35], Jann (2008) [36] suggested following formula for three-fold decomposition,

$$R = E + C + I \dots \dots \dots (1)$$

where, $R = (Y_A) - E(Y_B)$, $E = [E(X_A) - E(X_B)]'\beta_B$, $C = E(X_B)'(\beta_A - \beta_B)$, and $I = [E(X_A) - E(X_B)]'(\beta_A - \beta_B)$. Here $E(Y)$ s are the predicted rates of women having unwanted birth in two surveys A and B, X s are the vectors containing the predictors and constant, and β s contain slope parameters and intercepts. E represents the change in the proportion with unwanted birth because of the differences in population structure or characteristics (structural effect). C (unexplained part) represents the coefficient effect or effect sizes. Coefficient effect measures the contribution of changes in behavioral response to the predictors, that is the contribution of changes in the behaviour of the respondents in a segment of a population instead of change in the size of that segment. I represents the interaction effect accounting for the fact that differences in characteristics and coefficients exist simultaneously between the two groups. In this study, the unexplained part (coefficient effects) has been used as a measure of the effects of external factors (that is unobserved factors). Although the unexplained part has been primarily assumed to represent the effect of FP programmes, other factors such as diffusion effect can also have share in that unexplained part. This diffusion effect, however, may result from FP programmes as well along with the other factors. In the current study, increase in the proportions of women who are less likely to have unwanted birth has been considered as progress in population structure or characteristics that would result in a decline in unwanted childbearing.

Although the components of β s can be estimated using different models, this study uses logistic regression model. A key benefit of using logistic regression is that predicted probabilities for different subcategories are not affected by the categorization of the predictors [37]. In decomposition analysis, normalized estimates of regression coefficients have been used instead of usual estimates. Use of normalized estimates can solve the lack of invariance problem that emerges in detailed decomposition if a different category of a dummy variable is chosen to omit [38]. The statistical software SPSS and Stata have been used to perform the analysis.

Results

This section presents levels of and variations in the proportions of women and proportions of women having unwanted birth by selected background characteristics, odds of having unwanted birth by those characteristics, and decomposition of the effects of changes in different factors on changes in the proportions of women with unwanted birth.

Results of descriptive analysis

Table 1 shows a continuous decline in the proportions of women who married before the age of 18, had no education, had low socioeconomic status, and preferred more boys than girls over the study years. Proportions of women with higher education, non-Muslim women, and women preferred more girls than boys in all the study years are observed extremely small. The proportion with higher education, however, shows a steady increase over the study years (see Table 1).

It is seen from Table 1 that 15.3 percent women were having unwanted birth in 2004. This percentage marginally increases to 15.5 in 2007, and declines by 12.9 percent during the period 2007 – 2011. This percentage further declines to 10.3 in 2014, which is about 23.7 percent decline from 2011. In general, proportion having unwanted birth is observed to decrease with the increase in age at marriage, respondent's education, and socioeconomic status (see Table 1). On the other hand in all the surveys, women who were older, were working, were Muslim, preferred more boys than girls, and experienced child death are found more likely to have unwanted birth than their respective counterparts.

Table 1 Percent distribution of ever married women and those having unwanted birth by selected background characteristics, Bangladesh, 2007–2014

Characteristics	Percentage distribution of total women				Percentage of women experienced unwanted birth			
	2004	2007	2011	2014	2004	2007	2011	2014
Current age								
<30	73.9	73.6	75.9	80.5	7.2	7.9	6.7	4.9
30+	26.1	26.4	24.1	19.5	38.4	36.6	34.8	32.5
Age at marriage								
<18	84.0	78.1	75.9	71.5	16.6	17.2	14.7	11.6
18+	16.0	21.9	24.1	28.5	8.7	9.4	9.6	6.9
Education								
No education	34.8	25.7	18.2	13.5	23.5	26.5	26.9	25.1
Primary	30.7	30.6	29.9	27.5	15.5	17.5	17.2	13.5
Secondary	28.2	35.4	43.3	47.4	7.9	7.5	7.1	6.0
Higher	6.3	8.3	8.5	11.6	2.4	8.1	4.3	3.1
Current work status								
Not working	81.9	75.2	89.5	78.1	14.3	14.7	13.3	8.6
Working	18.1	24.8	10.5	21.9	20.3	18.0	15.1	16.1
Religion								
Muslim	90.9	90.8	90.1	92.0	16.0	16.1	14.2	10.7
Non-Muslim	9.1	9.2	9.9	8.0	9.0	9.9	7.2	5.3
Residence								
Urban	31.4	35.4	31.8	32.3	16.0	14.9	11.5	8.6
Rural	68.6	64.6	68.2	67.7	15.0	15.8	14.4	11.1
Socioeconomic status								
Low	38.3	38.0	37.3	36.4	18.5	19.3	18.2	13.9
Medium	32.0	32.4	32.5	31.9	14.8	14.2	12.6	9.5
High	29.7	29.6	30.2	31.7	11.8	12.0	8.8	6.9
Children's sex preferences								
Prefers equal boys and girls	80.0	83.6	88.4	88.7	14.8	15.2	13.0	9.7
Prefers more boys than girls	17.7	14.1	9.7	8.8	17.8	17.9	19.2	16.2
Prefers more girls than boys	2.3	2.3	2.0	2.5	13.5	12.2	9.0	8.8
Experienced child death								
No	75.8	84.5	84.2	87.3	12.6	13.3	11.6	9.0
Yes	24.2	15.5	15.8	12.7	23.8	24.3	23.9	18.9
Total	100 (5,366)	100 (4,920)	100 (7,325)	100 (4,491)	15.3	15.5	13.5	10.3

Values in the parentheses are group size.

Results of logistic regression analysis

Results of logistic regression analysis that are presented in Table 2 show that respondent's current age, age at first marriage, education, and religion are significantly associated with unwanted birth in all the study years.

Table 2 Relative odds of having unwanted birth by selected characteristics, Bangladesh, 2004-2014

Characteristics	Relative odds of having unwanted birth			
	2004	2007	2011	2014
Constant	0.157***	0.187***	0.148***	0.105**
Current age				
<30 ®	1.000	1.000	1.000	1.000
30+	7.898***	6.610***	7.267***	8.208***
Age at marriage				
<18	1.000	1.000	1.000	1.000
18+ ®	0.478***	0.462***	0.669***	0.624**
Education				
No education ®	1.000	1.000	1.000	1.000
Primary	0.807*	0.837	0.912	0.824
Secondary	0.536***	0.417***	0.484***	0.437***
Higher	0.147***	0.393***	0.196***	0.204***
Current work status				
Not working ®	1.000	1.000	1.000	1.000
Working	1.218	1.016	1.177	1.460**
Religion				
Muslim ®	1.000	1.000	1.000	1.000
Non-Muslim	0.614**	0.655*	0.483***	0.489**
Residence				
Urban ®	1.000	1.000	1.000	1.000
Rural	0.686***	0.842	0.903	0.966
Socioeconomic status				
Low ®	1.000	1.000	1.000	1.000
Medium	0.955	0.888	0.878	0.863
High	0.830	0.870	0.692**	0.804
Children's sex preferences				
Prefers equal boys and girls ®	1.000	1.000	1.000	1.000
Prefers more boys than girls	1.008	0.811	1.015	1.301
Prefers more girls than boys	0.819	0.688	0.543	0.918
Experienced child death				
No ®	1.000	1.000	1.000	1.000
Yes	0.946	0.944	1.051	1.018

® = Reference Category. *p < 0.05; **p < 0.01; ***p < 0.001

Besides these, unwanted childbearing is found significantly associated – with respondent's work status only in 2014 survey, with residing in rural areas only in 2004 survey, and with having a high socioeconomic status only in 2011 survey (see Table 2).

Results of decomposition analysis

Results of aggregate decomposition analysis that are presented in Fig. 1 show that the estimated absolute changes (that is total effects) in the proportion of women having unwanted birth during 2004 – 2007, 2007 – 2011 and 2011 – 2014 are, respectively, 0.002 (or 0.2 percentage points), -0.020 (or -2 percentage points), and - 0.032 (or -3.2 percentage points). The change in that proportion during 2004 – 2007 is found statistically non-significant, while changes in that proportion during the remaining two periods are found statistically significant.

During all the study periods, change in population structure exerts significant reducing effect on the proportion of women having unwanted birth (see Fig. 1). The coefficient effect is found non-significant during all the study periods, except during 2011 – 2014. While the interaction effect is found nonsignificant during all the study periods. During 2004 – 2007, structural and interaction effects reduce a total of 0.01 points of the total proportion having unwanted birth in 2004. Nevertheless, proportion having unwanted birth increases marginally (also statistically nonsignificant) during 2004 – 2007 because of the increasing effect of coefficient change. Out of the total decline in the proportion having unwanted birth during 2007 – 2011, 0.016 points decline (or 79.2% of total decline) is accounted for by the structural effect. During 2011 – 2014, structural and coefficient effects, respectively, accounts for 51.2 percent and 60.5 percent declines of the total decline in the proportion having unwanted birth (see Fig. 1).

Results of detailed decomposition analysis that are presented in Fig. 2 show that structural effects of respondent's age at marriage and education are significant during all the study periods. Increase in the proportion of women getting married at age 18 and over accounts for 146.4 percent, 5.2 percent and 2.8 percent decline of the total changes in the proportion having unwanted birth, respectively, during 2004 – 2007, 2007 – 2011, and 2011 – 2014. Decline in the proportion of women had no education contributes 0.006 points (418.8% of total change), 0.005 points (22.7% of total change), and 0.003 points (9.1% of total change) decline to the total changes in the proportion having unwanted birth, respectively, during 2004 – 2007, 2007 – 2011, and 2011 – 2014. The structural effect of higher education accounts for 159.8 percent and 9.9 percent decline of the total change in the proportion with unwanted birth during 2004 – 2007 and 2011 – 2014, respectively. While increase in the proportion with secondary education explains 20.1 percent of the total decline in the proportion

having unwanted birth during 2007 – 2011. During 2004 – 2007, coefficient effects of secondary education and higher education contribute, respectively, 0.009 points decline and 0.003 points increase to the total change in the proportion having unwanted birth.

Besides the aforementioned factors, increase in the proportion of women aged less than 30 years contributes 13 percent and 14.3 percent of the total declines in the proportion having unwanted birth, respectively, during 2007 – 2011 and 2011 – 2014. During 2011 – 2014, increase in the proportion of Muslim women accounts for 0.001 points (2.2%) increase of the total change in the proportion having unwanted birth. Only during 2004 – 2007, Increase in the proportion of urban women exerts a significant increasing effect on the proportion having unwanted birth.

Discussion And Conclusion

This article examines the factors that played key role in changing unwanted childbearing among ever-married women in Bangladesh during the period 2004 – 2014 using decomposition analysis. Findings show that proportion of women having unwanted birth stalls during 2004 – 2007, while that proportion declines substantially by 12.9 and 23.7 percent during 2007 – 2011 and 2011 – 2014, respectively. Logistic regression analysis shows a little progress in homogeneity among groups in experiencing unwanted birth after 2004, which is reflected in the smaller number of categories showing significant influence on unwanted childbearing in later years. Aggregate decomposition analysis shows that overall change in population structure persistently exerts significant reducing effect on the proportion of women having unwanted birth. While the effect of external factors other than those included in the analysis (coefficient effect), considered as the effect of FP activities, is found mixed over the study periods. This analysis reveals a weakness in the FP programme activities during 2004 – 2007. Interaction effect of structural and coefficient changes is found non-significant during all the study periods. Detailed decomposition analysis shows that all of the factors that are found significantly associated with unwanted childbearing in logistic regression analysis do not contribute significantly to the change in the proportion having unwanted birth.

It is obvious from the aggregate decomposition analysis that the progress in population structure, in particular, overall increase in the proportion of women with the characteristics that are negatively associated with unwanted childbearing persistently exerted significant reducing effect on the proportion of women having unwanted birth over the study period. Despite a significant reducing effect of structural change on unwanted childbearing, the marginal increase in the proportion having unwanted birth during 2004 – 2007 resulting from a large increasing effect of the change in behavioural response indicates an inadequacy of the support from FP programmes during that period, which spoilt the reducing effect of the structural change. Such inadequacy may result from either a decline in FP services, or from a little or no improvement in FP services compared to the increase in or change in the nature of the demand for them. The significant decline in the proportion having unwanted birth during 2007 – 2011 resulting from a significant reducing effect of structural change in presence of a non-significant reducing effect of the change in behavioural response indicates that a substantial change in population structure during that period reduced the proportion having unwanted birth significantly amid a non-declining FP services; this finding therefore indicates a sufficiency of support from FP programmes during 2007 – 2011 that can reduce unwanted childbearing significantly. Finally, the period 2011 – 2014 shows a more pronounced decline in the proportion having unwanted birth (3.2 percentage points or 23.7 percent decline) mainly resulting from the simultaneous significant reducing effect of the change in population structure and the change in behavioral response that is the improvement in FP services. During this period, the change in mean desired family size stalled at 2.2 children, as a result the proportion of women with the risk of having unwanted birth were unlikely to increase. Increase in the women with the risk of having unwanted birth during a period could be an extra burden to the existing FP programmes during that period. Therefore, the stall in desired family size during 2011 – 2014 also contributed to the large decline in unwanted childbearing during that period.

All the categories that are found significantly associated with unwanted childbearing in logistic regression analysis are not found to significantly contribute to the change in the proportion having unwanted birth in detailed decomposition analysis. Overall results show that decline in the proportions of women who married before the age of 18 and who had no education, and increase in the proportions of those with secondary or higher education play key role in reducing unwanted childbearing. Getting married at older ages shrinks the reproductive span of a woman remarkably, and female education helps women to be emancipated from the traditional role of woman as mother and wife [39, 40]; both these facts reduce the risk of the occurrences of higher-order births, which in turn reduces the likelihood of the occurrence of unwanted birth [41]. As the current study shows that an overwhelming majority of Bangladeshi women get married before the age of 18, and a large proportion of women do not have education, a substantial decline in the women in these two groups and increase in the women having secondary or higher education would play a vital role in reducing unwanted childbearing in the country.

Lower likelihood of unwanted childbearing among the women under 30 years of age, and also the reducing effect of the increase in the women in this group on unwanted childbearing imply that younger women in Bangladesh are better in implementing their reproductive preferences. A similar result is found by a study conducted in Bangladesh by Roy and Singh (2016) [17]. Although logistic regression analysis show that the likelihood of having unwanted birth is significantly higher in Muslim women than non-Muslim women in all the study years, increase in the proportion of Muslim women exerts a significant increasing effect on unwanted childbearing only during 2011–2014. This higher likelihood in Muslim women could be because of the fact that the activities of Muslim women are more restricted than that of the women with other religions, and also Muslim women are likely to accept pregnancy as "given by Allah" [19, 42]. Although rural women are found less likely to bear an unwanted child than urban women in all the surveys, their relationship is found significant only in 2004. The non-significant differences between the unwanted childbearing by urban and rural women in later years indicate an increase in the homogeneity among those two groups in terms of FP service and socioeconomic status. Rural women are found less likely to classify their births as unwanted than urban women probably because they desire much more children than the urban women. The mean desired family size of rural women is found more than 4 percent higher than that of urban women in all the study years [2, 30–32]. Children's sex preferences are found non-significant in influencing unwanted childbearing in all study years; this finding is analogous to that of other studies in Bangladesh [9, 43]. Besides these, although working women are found more likely to have unwanted birth in all the surveys, association between these two is found statistically significant only in 2014. Working women are expected to enjoy higher autonomy, and contraceptive use rate among them is also higher than that among nonworking women [44, 45]; these facts should keep the level of unwanted childbearing lower among working women than that among nonworking women. Therefore, the higher tendency to have unwanted birth among working women than that among non-working women suggests an independent study to explore the causes of this phenomenon.

Some existing studies on unintended childbearing in Bangladesh analysed some additional variables such as current and past use of contraception [17, 19]. The BDHS data that were used in those and current studies do not provide the time period of the past use of contraception; as a result, it is not possible to find out whether the women were not using contraception around the time of the conception of the baby whose birth were investigated, and current use of contraception definitely lacks correspondence with the time of that conception. Moreover, a woman may not consciously use contraception currently or in the past to conceive a baby, which may potentially be a wanted birth. These two facts clearly show that the past and current use of contraception is entirely irrelevant in studying unwanted childbearing at an unspecified point of time and therefore dropped from the analysis in this study.

Findings of this study reveal clear and specific information about the drivers of the changes in unwanted childbearing in Bangladesh. Results show that progress in population structure in presence of effective and non-declining FP services reduces the proportion of women having unwanted birth in Bangladesh substantially. While an improvement in FP services along with the progress in population structure speeds up that reduction. In particular, reduction in the proportion of women marrying before the age of 18 and having no education, and increase in the proportion having secondary or higher education exert significant reducing effect on unwanted childbearing. Findings of this study suggest that a further reduction in unwanted childbearing in Bangladesh is likely to come from the progress in population structure; in this progress, government and non-government organizations' efforts to increase women's age at marriage and extend women's education till at least secondary level would play vital role. An increased focus of law enforcing agencies on ensuring the legal age at marriage for girls (18 years in usual condition) in Bangladesh would help prevent women's marriage before the age of 18. Along with these, a continuous effort for extending and tailoring the FP services as per the needs of the women would accelerate the decline of unwanted childbearing. Many establishments, especially the private establishments do not provide some FP services such as menstrual regulation despite having all facilities [46]. Motivation level of the FP workers should be increased through training and other necessary measures. Since Muslim women are less receptive to contraception and weigh a variety of factors in choosing a contraception [47, 48], a provision of wide variety of contraception and skilled counselling support by the FP workers to Muslim women may increase contraceptive use among them [9]. Finally, it can be concluded that use of the findings of this study in formulating policies can be very helpful in controlling the population growth, and improving maternal and child health and family relationship in a cost-effective way by preventing unwanted childbearing in Bangladesh.

Abbreviations

FP: Family planning; BDHS: Bangladesh Demographic and Health Survey; DHS: Demographic and Health Survey

Declarations

Ethics approval and consent to participate

As this study is completely based on secondary data of 2004, 2007, 2011 and 2014 Bangladesh Demographic and Health Surveys, this section is not applicable to this study.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from <https://dhsprogram.com/> upon the request of access to the data. Corresponding author can also provide the datasets used and codes of decomposition analysis on reasonable request.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

MMR designed the study, selected the analysis techniques, analysed the data, interpreted the results and wrote the manuscript. JT recoded, arranged and sorted the data. She also prepared the data file for analysis. All authors read and approved the final manuscript

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Figures

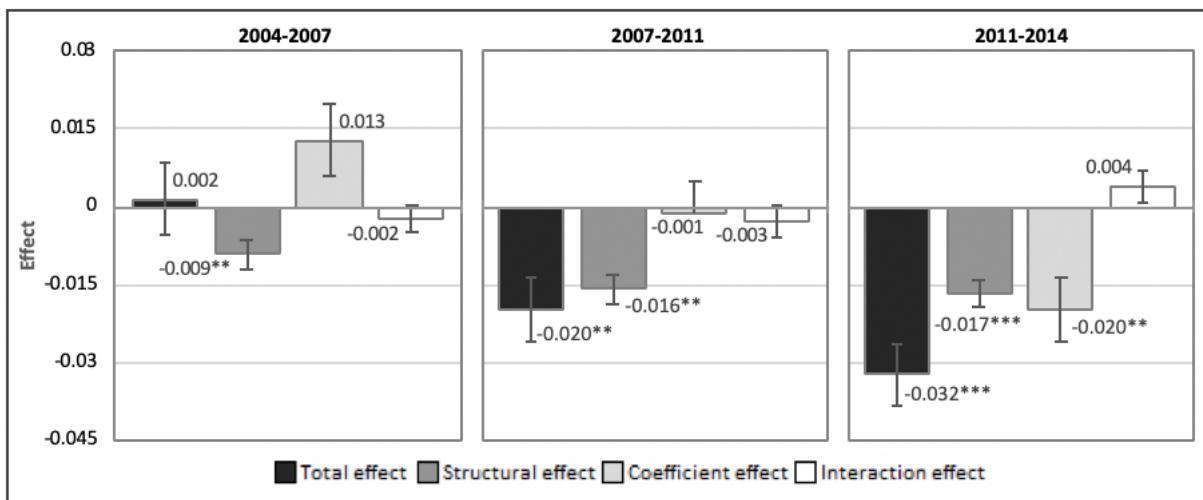


Figure 1

Aggregate decomposition estimates of changes in proportions of women having unwanted birth during 2004–2014, Bangladesh. Data labels represent estimated contributions; Rounded up three decimal points of the estimates have been presented; **p < 0.01; ***p < 0.001.

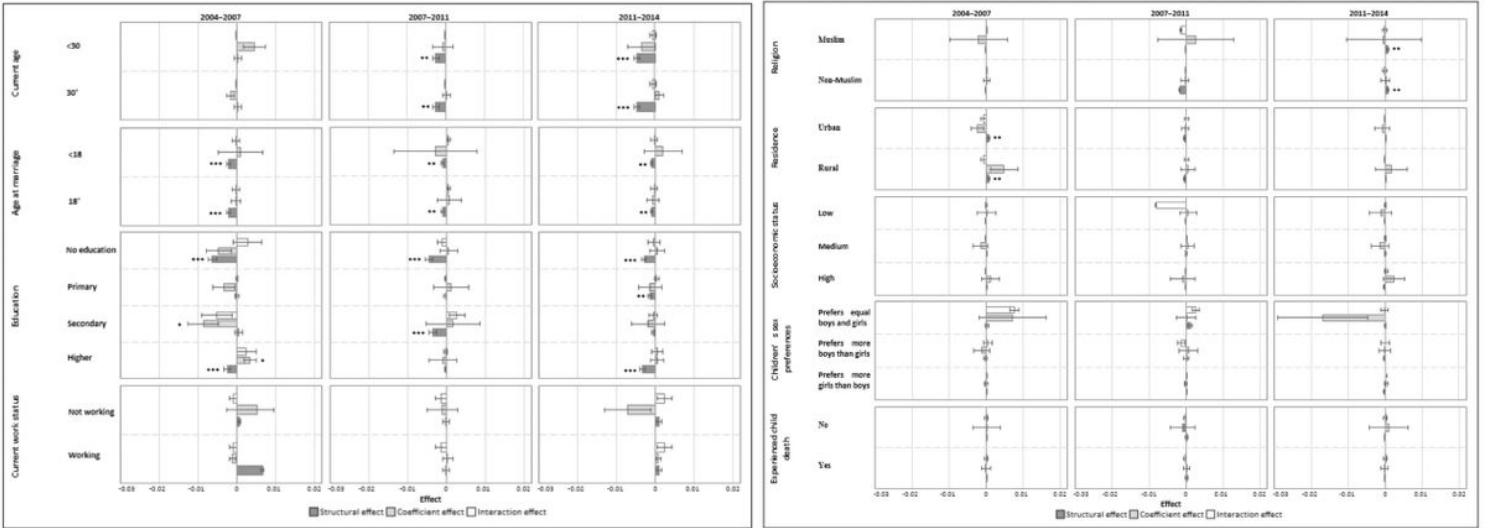


Figure 2

Detailed decomposition estimates of changes in proportions of women having unwanted birth during 2004–2014, Bangladesh. Bars are the standard errors of the estimates; Constants of coefficient effects: 2004–2007=0.011, 2007–2011=−0.004, and 2011–2014=0.005; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.