Marriage and First Birth Intervals in Early and Late Marrying Societies: An Exploration of Determinants

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I. Introduction

Delayed marriage is often featured in population policy discussions as an effective strategy to delay childbearing. Timaeus and Moultrie's (2008) conceptualization of birth postponement, as opposed to birth spacing by childless and parous women, also suggests the importance of the timing of first births for its implications for cumulative fertility. Yet it is commonly observed that the timing of first birth does not co-move with delays in first marriage in direct and mechanistic ways as expected. Mensch, Bruce and Greene (1998) have reported that changes in average age at first birth were of considerably smaller magnitude than delays in first marriage, which were quite substantial in many of the Demographic and Health Survey (DHS) countries studied. Several observers have suggested that marriage delays are driven primarily by increased school attendance among girls (Lloyd, 2007). In some parts of the world, the rise of premarital sexual activity or the rise of consensual unions to replace marriage to mark entry into sexual relations may be the driver of age at first birth rather than the timing of marriage (Greene and Rao, 1995; Singh and Samara, 1996). However, where arranged marriage and early marriage remains the norm, late onset of childbearing and first pregnancy, may be related primarily to sub-fecundity of young women at the time of their marriage.

In this paper we explore trends in age at first marriage and first birth intervals in two DHS countries where the rise of sexual activity outside of marriage is not an important part of the demographic transition, and explore explanations that focus on marriage norms. Specifically we contrast these patterns in early and late marrying contexts. We hypothesize that the delayed pregnancy and first births may be expected to play out differently in early and late marrying settings. In early marriage regimes, particularly where marriage is early enough so that substantial proportions of young women are subfecund when they marry, a long first birth interval is the norm, and there is less of a cultural compulsion to have children soon after marriage. On the other hand, in late marrying societies when young women are in their highest periods of fecundity, societies are impatient to establish fertility through pregnancy. These settings may be more resistant to delayed childbearing and contraception in the first birth interval.

A policy implication of these different marriage regimes is different population policy emphasis that may be somewhat counterintuitive—it might be more acceptable and efficient to promote and gain acceptance of contraceptive use in the first birth interval in settings where marriage is early, even if it is more conservative in other respects, to achieve delayed childbirth. In late marrying settings where the first birth interval is normally short one should expect greater resistance to acceptance of birth control and norms may evolve to delay sexual initiation and marriage instead.

The paper is organized as follows—Section II reviews the relevant literature; Section III describes the data and methods; section IV discusses the results of the analysis and Section V concludes.

II. Literature Review

Age at First Marriage and First Birth Interval

Despite its important population policy implications, the relationship between age at first marriage and first birth interval has not received much attention in the literature. Among the few studies that directly addresses these constructs, Trussell and Reinis' (1989) analysis of the World Fertility Survey data from 41 countries provides some evidence to support our hypothesis, suggesting that societies that marry substantially later than menarche do observe a shorter birth interval, particularly if contraception is not practiced. Early marrying societies on the other hand are expected to have a longer birth interval, particularly when timing of marriage and the actual cohabitation of couples (and hence sexual union) do not coincide, as is the case in many countries where marriage is very early. The potential causes for this hypothesized relationship however have not been substantiated adequately.

On the dynamic aspects of our society, ie, what happens when marriage and childbearing is delayed, much of the limited literature on this topic focuses on the endpoint of later marriage and attributes shorter birth intervals after later ages at marriage to changing sexual and reproductive behaviors of late marrying couples that motivate them to establish fertility soon after marriage to compensate for their late starts. Such behaviors have been attributed mainly to the social and cultural transformation in attitudes about sexuality outside of marriage and changing marriage regimes from arranged to romantic unions (Malhotra &Tsui, 1996; Feng & Quanhe 1996; Shrestha 1998; Hong, 2006). Contraceptive use is also found to be uncommon in late marriage regimes (Trussell and Reinis, 1989). To the extent that later marrying regimes have resulted from greater volition and control over sexual lives, it is unclear why higher rates of contraception, and to an extent longer birth intervals, are not observed in these settings. In explaining the observed shorter birth intervals, we hypothesize that they are governed by a more underlying biological reason rather than the more sociological explanations noted above.

We hypothesize that late marrying couples in these regimes form unions at the most fecund periods of women's reproductive lives. Couples are simply more likely to conceive during this time, independent of their potential motivation to compensate for their late starts by entering childbearing soon after marriage.

In early marrying regimes, a longer first birth interval has been observed routinely and consistently and the relationship is much more consistent than in late marrying societies where a wider range of birth intervals are observed. The length of interval conditioned upon other factors such as the prevalence of extra marital relations and the use of contraception after marriage. Yet very little research has been devoted to exploring why such longer birth intervals exist. We hypothesize two ways in which early marriage regimes may affect

the timing of first birth. First as noted before, there may be a purely biological element at work where, regardless of sexual behavior, those who marry early may have a long first birth interval because they are married and exposed to pregnancy risk while they are still at a subfecund stage of life. The age at marriage in these societies is substantially low and a majority of unions take place when girls are subfecund. A second order of effect may also be at work. When a large majority of women are married at early enough ages expectations of subfecundity may inform and shape societal expectations of the timing of childbearing for women and long first birth intervals are accepted as the norm, relieving pressure on women to establish fertility immediately after marriage at a very young age. In contrast, in late marrying societies when women are typically married during peak fecundity years, women are likely to conceive soon after marriage, and if the majority are non-contracepting, societal norms and expectations will evolve around short first birth intervals. From a demographic point of view, such an explanation is quite plausible. Yet only anecdotal references have been made to this potential explanation for longer birth intervals in studies such as Basu (1993), Mensch et al. (1998) and Udry and Cliquet (1982).

A few observers have explored aspects of kin behaviors and social norms that influence birth interval length postulating a mediating role for sexual frequency. Fricke and Teachman (1993) found that cross-cousin marriages had shorter first birth interval but couples who resided in joint families typically had their first birth later and suggested that frequency of intercourse in the early years of marriage played a part. Basu (1993) explored patterns of shorter birth interval coupled with later marriage in the south of India and contrasted it with longer birth intervals and earlier marriage in the north and suggested that frequent home visits by young brides in the north may explain longer intervals there.

In this paper, we aim to explore whether such fecundity dependent patterns in age at first marriage and first birth are evident and hold in different societies around the world. A pattern of results across cultures and countries showing a consistent negative relationship between age at marriage and length of first birth interval would suggest that biological factors fundamentally affect this relationship, ceteris paribus, given the considerable variation in marriage cultures, and reproductive and sexual regimes around the world. Further, we also explore whether such patterns that depend on biology subsequently give rise to differential societal expectations about sexual and reproductive behavior, resulting in late and early marriage regimes that predict first birth intervals differently. Such a mechanism that attributes changes in patterns of the timing of childbearing and behavior to both biological and societal factors has been proposed in the early work of Udry and Cliquet (1982) on age at menarche and age at first birth. In this paper, we present findings from graphical and trend analyses that document these relationships cross-culturally. We then explore the explanations of these patterns by using multivariate and multilevel analyses using two contrasting country cases in Bangladesh and Egypt that represent distinct early and late marrying regimes respectively. Important

implications of our findings to population policy, particularly for the promotion of contraception and family planning in different marriage regimes are also discussed at length.

III. Data & Method

Data

Data for the analyses in this study come from the Demographic and Health Surveys (DHS) (ICF Macro International). The Demographic Health Surveys are nationally representative cross-sectional surveys of ever married or currently married women of reproductive age (15-49 years) collected periodically in over 60 developing countries around the world. The DHS is a widely used multi-topic survey that collects information on key demographic characteristics of women and their households, and detailed information on topics such as fertility, family planning, mortality, maternal and child health and nutrition, HIV/AIDS, and other topics in population and health.

In this study, we utilize DHS data in two sets of analyses to address our research questions and hypotheses. First, we use multi-country data in a set of graphical and descriptive analyses to illustrate hypothesized relationships between first birth interval, age at first marriage and the use of contraception during the first birth interval. For these analyses, we utilize data from the most recent DHS survey conducted between 2004-2009 in 29 countries from Africa and Asia[1], which are compiled using the web-based DHS Stat Compiler application. In a second set of analyses, we use multivariate analyses (described in detail in the empirical strategy section) on specific country-level cases that represent early and late marrying regimes to explore the hypothesized relationships on individual and normative influences further in these distinct settings while controlling for potentially confounding covariates at both individual and higher levels of influence. For these analyses, we utilize detailed individual and household data from the most recent DHS surveys conducted in two countries: Bangladesh (2007) and Egypt (2008), which represent distinct early and late marrying regimes respectively. The 2007 Bangladesh Demographic Health Survey (2007 BDHS) enumerates data from 10,996 ever-married women aged 15 to 49 from 10,400 households in Bangladesh. Similarly, the 2008 Egypt Demographic Health Survey (2008 EDHS) collects data from 16,527 women aged 15-49 in Egypt. Only data from ever-married women who have borne at least one child are used for the analysis.

Measures

The key premise of this study and the analyses noted above is centered around three main constructs: first birth interval, age at first marriage, and use of contraception during the first birth interval for women, which

[1] DHS Surveys Included (most recent surveys): Bangladesh, Benin, Cambodia, Cameroon, Chad, Congo, Dem. Rep. of Congo , Egypt, Ethiopia, Ghana, Guinea, India, Indonesia, Jordan, Kenya, Lesotho, Madagascar, Malawi, Mali, Nepal, Nigeria, Niger, Pakistan, Philippines, Sierra Leone, Tanzania, Uganda, Zambia, Zimbabwe.

make up the key measures in this study. The key dependent variable in this study is the length of the first birth interval. In the multivariate analysis for both Bangladesh and Egypt, this variable is measured as length of time in months between an individual's time of first marriage and the timing of the birth of their first child. For the multi-country analysis, a country-specific variable representing the median first birth interval in months for each of the 29 countries is measured. There are two main independent variables: first, age at first marriage, is measured in years for each country in the analysis and represents the age at which the respondent first entered a union. Owing to variations in culture and context, this measure is variably defined in different DHS countries and is uniquely defined in our two country cases, Egypt and Bangladesh, as well. In our two country cases, this measure in the DHS represents the time in each setting when couples begin their exposure to sexual relations and hence the risk of pregnancy. In Bangladesh, it is defined as the age at which the respondent began to live with her husband for the first time. In Egypt, it is defined as the age at which respondent entered into a "marriage contract" with her husband as per tradition. In the multi-country analysis, we use median age at first marriage, as defined for each setting, for each of the countries. Secondly, we also measure the use of contraception during the first birth interval. This measure is based on a variable that indicates whether a woman in the sample used any form of contraception at zero parity, i.e. before the birth of their first child. In the two country cases that we employ for this study, this translates roughly into the first birth interval, as childbearing almost exclusively occurs within marriage in these two settings. This variable is simply coded as a dummy variable which is equal to "1" or "yes" if the respondent used any form of contraceptive during the first birth interval and "0" or "no" if they did not. For the multi-country analysis, we use a measure of the proportion of women in each country that used contraceptives during the first birth interval.

In the multivariate analysis that examines the determinants of the first birth interval, we introduce several measures as control variables in our models that represent factors that may influence the length of first birth interval. These constructs are based on a review of the extensive literature on the determinants of the first birth interval. Here, we measure the following:

1) Marriage Cohort: We use a measure of the duration of the respondent's marriage to determine marriage cohorts. In our analyses, we pay attention to two distinct cohorts: women who were married 30 or more years ago and women who have been married for less than 10 years. The older cohort of women, who have been married for over 30 years, in both settings, likely represent uniquely distinct experiences with both the use and availability of contraceptives and with sexual and reproductive regimes in their respective countries compared to the younger cohort who married within the last ten years of the survey. We expect that the division of cohorts at this level will represent a distinct set of

norms even within distinct country settings.

2) School attainment of the Respondent and the Spouse: We measure school attainment of both the respondent and the spouse using detailed information available in the DHS on educational attainment. We use a series of mutually exclusive dummy variables representing whether the respondent or their spouse had attended never attended a school "No School", or whether they can completed schooling at the primary level "Primary School", secondary level "Secondary Level", or at a level higher than secondary school "College".

3) Urban-Rural Regions: We capture urban-rural differences in the DHS data using a dummy variable indicating whether the respondent lived in an urban area or a rural area. This variable is coded as "1" or "yes" if they did and "0" or "no" if they did not.

4) Household Socioeconomic Status: The socio-economic status of households is derived from the widely used wealth-index developed by Filmer and Pritchett (2001), which is available for all households in DHS surveys conducted around the world. In the absence of reliable consumption measures which are most commonly used as income proxies, the asset index poverty-wealth measure have been used widely as a high quality substitute since its development. This measure is constructed in the DHS using information on household assets and the quality of the dwelling by employing principle components analysis (see Filmer and Pritchett (2001) for a detailed description of the construction of this measure). We use this measure in the conventional form of quintiles, ranked from 1(poorest) to 5(richest) and create a set of five mutually exclusive dummy variables denoting the household's economic status. In order to account for rural-urban differences in the ownership of assets and quality of housing, we first rank households in urban and rural areas into quintiles separately and then combine households in each quintile ranking category of urban and rural regions to create a composite wealth-index socioeconomic status variable that accounts for these differences (e.g. households from the first quintile in the urban regions are combined with households in the first quintile of the rural region). In the case of Bangladesh, where a nuanced set or urban-rural division variables are available (large-city urban, small city urban, town, or rural).

5) Country Specific Variables: Given the distinct cultural contexts and nuanced ethnicity and religion-based variation possible in the different country settings, we also measure some country specific variables and introduce them in the models as controls. For example, in Bangladesh, we include religion in the model with a dummy variable indicating whether the respondent is Muslim to account

for religion-based differences in sexuality and reproduction regimes. In the model for Egypt however, we do not utilize any analogous variables.

6) District or Division-Level (community-level) variables: Given our discussion of social norms as factors that may influence first birth intervals, age at marriage and the use of contraception, we also introduce higher-level variables - community level means for age at first marriage and use of contraception during the first birth interval - as variables that capture culture or social norms regarding these practices within the areas that the respondents reside in within higher regime level demarcations of norms. These variables enable us to allow for variation not just at the individual level for the respondent, but also at a higher region-based culture level of norms regarding these practices in our multivariate analyses. In Bangladesh this variation is captured at a level that represents the intersection of districts and religion. We opt to go beyond a more conventional district level aggregation particularly because these practices have been observed to vary starkly between Muslim and non-Muslim populations even within the same district. We thus construct a unique cluster identifier for Muslim and non-Muslim populations in each district to produce 128 district-religion groups (two groups each in Bangladesh's 64 districts). In Egypt, we allow for variation at the governorate level, creating unique aggregation clusters around its 29 governorates. These division level means are calculated as *non-self means.* Non-self means essentially calculate the average of the responses of all individuals in a particular district or division for each individual excluding only the response of that individual from the mean. This effectively removes the individual's contribution to the average, thus essentially eliminating the possibility of any bias that the response of the individual might contribute in calculating the division level mean.

Empirical Strategy

The empirical strategy in this paper, as noted above, involves two sets of analyses to address our research questions and hypotheses. The first set of analyses is mainly descriptive and uses a series of graphs and figures to illustrate bivariate relationships between the three key constructs described earlier. This includes graphical representation of the relationship between age at first marriage and the length of the first birth interval using multi-country DHS data from Asia and Africa and a series of descriptive tables that compare lengths of first birth interval and the use of contraceptives during the first birth interval (using country level medians) in early and late marrying regimes. We also include graphical analysis of the trends in contraceptive use during the first birth interval and age at first marriage over time in our early and late marrying country cases using retrospective DHS data figures as well.

We explore these relationships further in a multivariate and multi-level framework in a second set of analyses using data from one late marrying (Egypt) and one early marrying (Bangladesh) country case. As noted above, the focus in this paper is to explore the influence of social norms related to marriage and reproductive behavior on determining the first birth interval rather than conventional variables that have widely been studied in the literature on the determinants of the first birth interval. More importantly, our assertion is that the first birth interval in different marriage regimes are dictated by underlying biological factors that drive social norms related to marriage, subsequently influencing the timing of first birth. These relationships are expected in settings where childbearing continues to take place predominantly within marriage and contraceptive use is still relatively uncommon. In considering the influence of social norms, we should note that norms in this study are operationalized at several different levels. The separation of our analysis by early and late marrying regimes itself represents the highest level at which we differentiate norms in our two settings. Bangladesh and Egypt each represent regimes with distinct norms on sexuality and reproduction. We also demarcate norms by cohorts of women by presenting analyses on two distinct older and younger cohorts of women. These cohorts of women, even within the same marriage regime, may represent exposure to a distinctive set of norms that dictate their sexual and reproductive behavior. For instance, in each of our cases, Egypt and Bangladesh, older cohorts of women have significantly low levels of contraceptive use in the first birth interval despite having reasonably different patterns in timing of marriage. As contraceptive use has become more prevalent in more recent years, even in the first birth interval, this factor has become an important factor in determining the first birth interval for more recent cohorts. The acceptance and use of contraception during this time however is starkly different in our two country settings, as we will see in our descriptive analysis.

Thus social normative factors at several levels may influence the first birth interval. While we demarcate higher levels of potential social normative influences by stratifying our analysis by early and late marrying regimes and older and younger cohorts, we also explore influence of social norms related factors at the regional (or societal) level within these distinctions. To this effect, we propose a multivariate model that modifies previous work on the determinants of first birth interval, to explore how societal level variables within marriage regimes and different age cohorts that still are distinct enough denote a particular kind distinction regarding sexual and reproductive behavior (henceforth "variable indicating social norms"), affects the length of the first birth interval. We concurrently specify models to test the role of biological factors as proxied by the individual's age at first marriage (henceforth "variable indicating biological influences) in determining patterns in first birth interval as well. This represents the lowest level at which we examine the influence in variation in the first birth interval. In these models, we explore the influence of

contraceptive use during the first birth interval as a key covariate, and in some models as the dependent variable, to determine how the dynamics of these relationships change when contraceptives come into play.

In the first set analyses in this portion of the paper, we examine differences in age at first marriage, the length of first birth interval, and use of contraception during the first birth interval, in both Bangladesh and Egypt, by two distinct cohorts of women: women who have been married for more than 30 years, a significantly older cohort representing conservative social norms regarding sexual and reproductive behaviors and marriage customs in both settings and women who have been married for less than 10 years, a group of women who are expected to be exposed to less conservative norms and who have a higher propensity to be using contraceptives, in general, and during the first birth interval. Among the older cohort of women in both settings, childbearing takes place almost completely within marriage and contraceptive rates are extremely low or nil. The relationships between these aforementioned constructs for this older cohort of women are likely to be largely dependent on these higher levels social normative factors, particularly when contraceptives do not intervene or confound these relationships. In the second portion of our analysis, we examine the younger cohort of women who have been exposed to modern contraceptives in a multivariate and multilevel framework. These models aim to delineate, in both settings, whether empirical links between first birth intervals and normative factors continue to exist, or whether they are influenced or altered by the advent of modern contraception among these young women. Our ultimate goal is to be able to generate evidence that provides insights on population policy aimed at delaying first birth and how these strategies might be best positioned in different marriage regimes. Can contraceptive use alone be mobilized to achieve longer first birth intervals in future cohorts of women or whether delay of marriage might still generate desired delayed first birth outcomes?

These models that we employ for the younger cohort of women can be constructed for each country as follows:

$$\textbf{First Birth Interval (Y)} = \beta_0 + \beta_1'X + \varepsilon$$

Where X's represent a vector of determinants of the first birth interval. In the current analysis, we used the following variables:

1) Age at first marriage
2) Educational attainment of the woman and spouse
3) Socio-economic status as measured by DHS constructed wealth quintiles.
4) Religion
5) Region of Residence (urban/rural)

We modify this model by specifying a two level hierarchical model, where variation is allowed at the individual level (Level 1) and also at a higher regional level, e.g. district or division level (Level 2). We allow this higher-level variation to estimate social norms effects within a particular marriage regime, by constructing a societal level indicator of mean age at first marriage, the operationalization of which has been described earlier. In a series of nested models, we also test for the influence of the use of contraceptive use at zero parity by estimating models that include this variable, which is measured at the individual level. All other variables noted above are specified at the individual level (Level 1). All models are run using robust standard errors using the "cluster" command in STATA, clustered around the division or district level variables used for the higher level analyses. This sequential set of models can be written out as follows:

$$\textbf{First Birth Interval (Y)} = \beta_0 + \beta_{1\,(\text{Level 1})}\,\textbf{(Individual Age at First Marriage)} + \beta_{2\,(\text{Level 1})}\text{'}\,\mathbf{X} + \varepsilon$$

$$\textbf{First Birth Interval (Y)} = \beta_0 + \beta_{1\,(\text{Level 1})}\,\textbf{(Individual Age at First Marriage)} + \beta_{2\,(\text{Level 1})}\text{'}\,\mathbf{X} + \beta_{3\,(\text{Level 2})}\,\textbf{(District/Division Mean of Age at Marriage)} + \varepsilon$$

$$\textbf{First Birth Interval (Y)} = \beta_0 + \beta_{1\,(\text{Level 1})}\,\textbf{(Individual Age at First Marriage)} + \beta_{2\,(\text{Level 1})}\,\textbf{(Individual Use of Contraceptives at 0 Parity)} + \beta_{3\,(\text{Level 1})}\text{'}\,\mathbf{X} + \beta_{4\,(\text{Level 2})}\,\textbf{(District/Division Mean of Age at Marriage)} + \varepsilon$$

In these models, the estimates of two coefficients are of particular interest: the societal level variable for mean age at first marriage and the individual level variable of age at first marriage. If our hypothesis that marriage regimes influence the length of birth intervals holds, the societal level social norms variable should have an independent significant negative effect on the length of the first birth interval, even after controlling for these other potential determinants; i.e. the longer the mean age at marriage is in a particular region, the length of birth interval for individuals would be expected to be statistically shorter. If our assertion that a biological reason related to fecundity at the time of marriage exists that determines the length of birth interval is true, then an independent significant negative association between individual level age at marriage and the length of birth interval should also be clearly observed even after controlling for all individual factors. If both biological and social norms related factors jointly determine the length of the first birth interval, then significant independent negative associations with the first birth interval should be observed in a model that includes both of these variables. For a definitive assertion that both biological and social norm related factors at the divisional or district level, even within distinct marriage regimes, affect the first birth interval, these associations would have to be consistently observed in both late and early marrying societies even with contexts that are vastly different. The addition of contraceptive use during the first birth interval to these models will provide insight on how it affects the birth interval and whether its influence dilutes or even completely takes over the overall influence on first birth interval. A set of analyses that examine the

determinants of contraceptive is also run examining the influence of norms set in place by older cohorts of women on the use of contraception during the first birth interval of younger women. These models are described in further detail in the results section.

IV. Results

Preliminary Descriptive Results

Before we discuss the findings from the multivariate results, we first present a series of graphical descriptive analyses of the relationships between the various constructs discussed in this study. First, in Figure 1, we present a scatter plot of median age at first marriage in years and median first birth interval in months in 29 developing countries in Africa and Asia[2] from the DHS. Figure 1 shows a clear negative association between age at first marriage and first birth interval, suggesting that birth intervals decline with the increase in age at marriage. Although the focus in the literature has been on late marrying regimes, as noted above, the negative association between age at marriage and first birth interval is seen to be much more consistent for earlier marrying regimes. In countries where the median age at marriage is under 17, median first birth interval is consistently higher than 2 years (24 months). The contrast in first birth intervals is further illustrated in Table 1, which compares countries at opposite ends of the spectrum in terms of age at marriage.

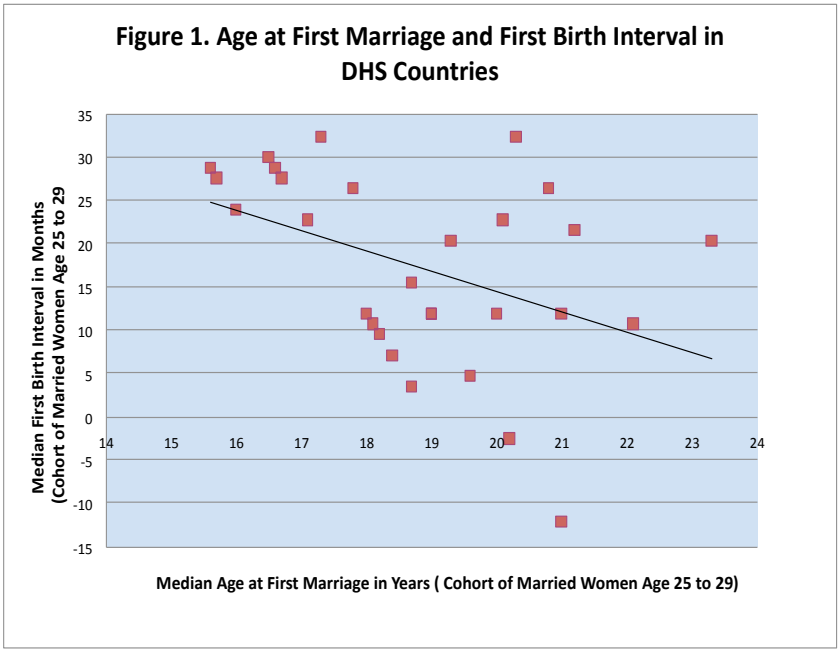

Table 1 presents median first birth intervals for both late and early marrying regimes in the most recent DHS conducted in each country. Median age at marriage is reported from the first formal DHS conducted in each country. The difference in the length of first birth intervals in these two different regimes is stark and clearly evident. In early marrying regimes presented here, the first birth interval is consistently longer than two years and in the extreme case of Niger, as long as 5 years. In later marriage regimes, birth intervals are consistently shorter and all under 2 years. An extreme case presented here is that of Tanzania, where couples conceive almost immediately after marriage and have their first child within one year of their union. We also present

[2] DHS Surveys Included (most recent surveys): Bangladesh, Benin, Cambodia, Cameroon, Chad, Congo, Dem. Rep. of Congo , Egypt, Ethiopia, Ghana, Guinea, India, Indonesia, Jordan, Kenya, Lesotho, Madagascar, Malawi, Mali, Nepal, Nigeria, Niger, Pakistan, Philippines, Sierra Leone, Tanzania, Uganda, Zambia, Zimbabwe.

figures for the proportion of women who used contraception during the first birth interval. The two country cases that we build our multivariate analysis around appear to be exemplary of differences in use in contraception between regimes during the first birth interval. In Bangladesh, 20.1 % of all women of reproductive age in 2007 reported that they used contraceptives before the birth of their first child. On the other hand only 0.2 % of Egyptian women of reproductive age reported using contraceptives during the first birth interval. Other differences in contraceptive use during this interval is less apparent. Our country cases however represent distinct regimes in terms of contraceptive use before first birth as well.

Early Marrying Regimes				Late Marrying Regimes			
EARLY	**Median Age at First Marriage in Years (First DHS)**	**Median First Birth Interval in Months (Most Recent DHS)**	**% Using of Contraceptives during First Birth Interval (Most Recent DHS)**	**LATE**	**Median Age at First Marriage in Years (First DHS)**	**Median First Birth Interval in Months (Most Recent DHS)**	**% Using of Contraceptives during First Birth Interval (Most Recent DHS)**
Bangladesh	14.8	28.8	20.1	**Egypt**	19.5	21.6	0.2
Mali	15.9	27.6	4.3	**Jordan**	21.2	20.4	2
Niger	14.9	63.6	0.5	**Vietnam**	21	22.8	4.5
Nepal	16.5	32.4	7.5	**Tanzania**	19	12	3.1

Table 1. Age at First Marriage, First Birth Interval and Contraceptive Use during the First Birth Interval in Early and Late Marrying Regimes

Given these stark differences in Bangladesh and Egypt, we explore these differences further graphically in Figure 2. In Figure 2, we present the trends in median age at first marriage and the proportion using contraception during the first birth interval in these two countries over time using DHS data from all available surveys in the last three decades. The goal of this analysis is to examine contraceptive use during the first birth interval over time in both early and late marrying settings and to explore whether there was a rise in contraceptive use in one or both settings and whether increases in either setting is disproportionate and could potentially explain the difference in first birth interval between these two settings.

The results in Figure 2 are striking. First, we observe, as expected, that there is a clear difference in the levels of median age at first marriage between the two countries over time. However, while the trend in age at marriage in both countries is upward, in roughly the same time frame, gains in Egypt were almost twice that of the gain in Bangladesh. We should however note that gains in either country are only modest, suggesting that while age at marriage trended upward, they did not do so dramatically. This is perhaps an indication that norms related to the timing of marriage didn't vary significantly. Results for the use of contraception during the first birth interval however were striking. In Egypt, contraceptive use during the first birth interval, which is near zero in the beginning time period appeared to decline and stagnate near zero. This is an indication that contraceptive use during the first birth interval, instead of gaining acceptance, appeared to have lost ground.

In juxtaposing this result against the gain in age at marriage, it is conceivable that as women married later, the increase in age at marriage could have elevated the level of impatience in establishing fertility soon after marriage, thus countered the advent of contraceptives, particularly during the first birth, decreasing its use during this time. This is however only speculative and multivariate results are likely to reveal important insights on this point. In Bangladesh however the rise in use of contraception during the first birth interval is dramatic and tremendous gains appear to have been made since the early 1990s. This fuels our speculation earlier that despite being what might be considered to be a conservative society, a country like Bangladesh, where girls marry before they reach fecund periods in their lives, might be more open to contraceptives even in the first birth interval simply because the norms around expectations of having children right away are likely not as strong. It is also plausible that these relationships are purely age dependent. If this were to be the case, then we would see either a decline in use of contraception or at the very least a stagnation of usage when the median age at marriage reaches an age where girls have passed puberty and infecundity. In Egypt however, late marriage already ensures delayed conception and births, and as marriage takes place during fecund periods of women's lives, the motivation to use contraception might not be as high as pressures to start bearing children might become increasingly stronger.

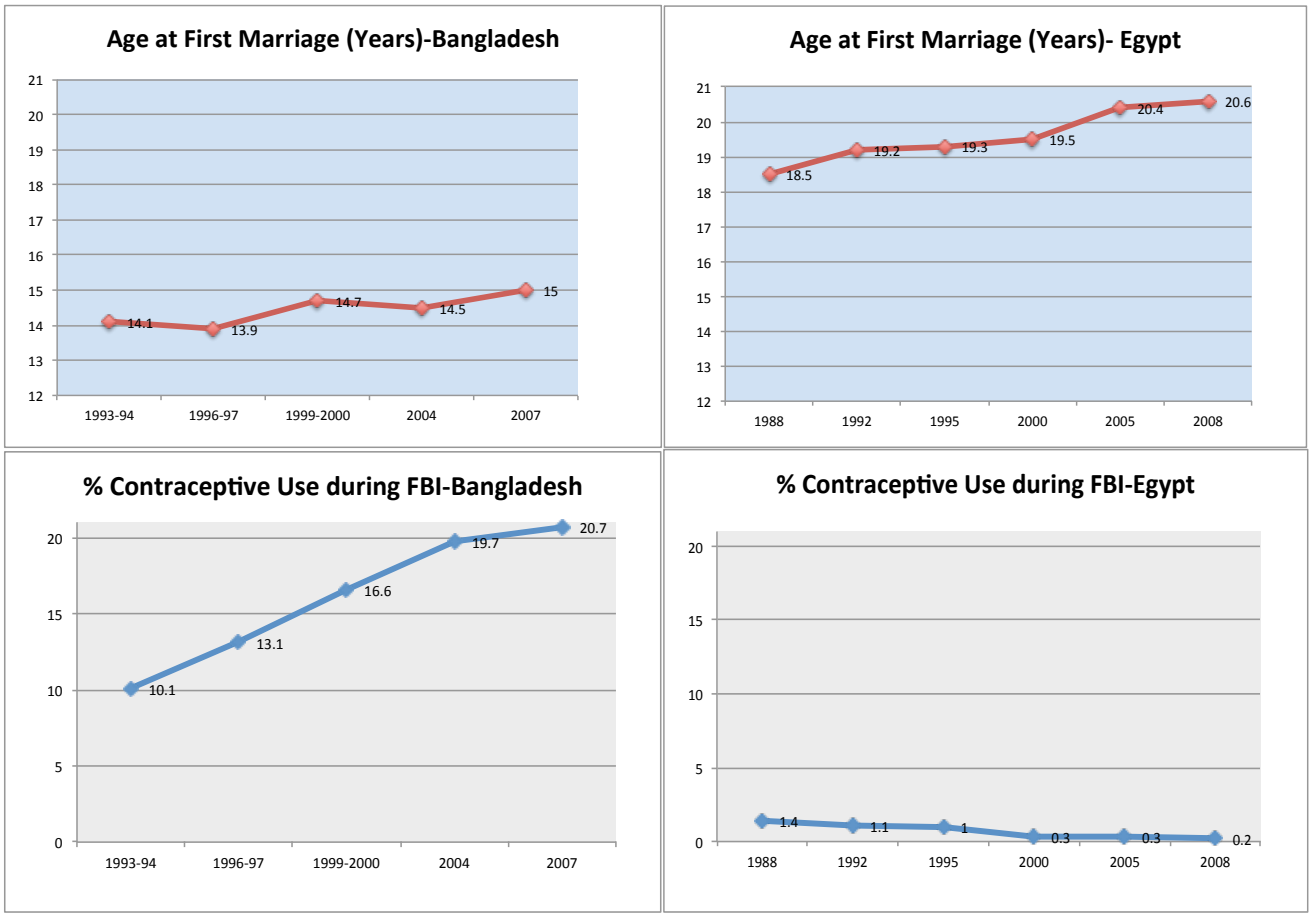

Figure 2. Graphs of Age at First Marriage and Proportion using Contraceptives in the First Birth Interval over time in Bangladesh and Egypt.

Multivariate Results

Cross Tabulated Results for the Older Cohort (Married for 30 years or more)

	Cohort	Age at First Marriage in Years		Length of First Birth Interval in Months		% Using Contraceptive during First Birth Interval	
		Mean	SD	Mean	SD	Mean	SD
Bangladesh (2007)	Older (Married 30 +Years ago)	13.39	1.56	44.96	37.63	0.04	0.1
	Younger (Married under 10 Years ago)	16.54	3.12	21.72	14.75	0.38	0.49
Egypt (2008)	Older (Married 30 +Years ago)	14.54	2.02	41.44	38.62	n/a	n/a
	Younger (Married under 10 Years ago)	20.52	4.1	15.85	10.51	0.004	0.06

Table 2. Table of Age at First Marriage, Length of first birth interval and Contraceptive use during the first birth interval cross-tabulated by Cohort in Bangladesh and Egypt.

In Table 2, we present some preliminary results on age at first marriage, length of first birth interval and use of contraception during the first birth interval in Egypt and Bangladesh stratified by age cohorts. In this table we capture the variation in these constructs over time based on reports from women regarding these practices during the initial stages of their marriage. We present figures for the youngest cohort, married under 10 years ago, and for the oldest cohort who were married over 30 years ago. The key result of note from this table is that a clear indication of distinct marriage timing regime differences is only evident in most recent cohorts. Both Egypt and Bangladesh married substantially early more than 30 years ago and faced almost identical first birth intervals. Contraceptive use during the first birth interval was also very low in Bangladesh and virtually nonexistent in Egypt. In the absence of contraception, our assertion that lower ages at marriage co-exist with higher first birth intervals appears to be confirmed in both settings, where marriage age is considerably low for both of these cohorts. However, in examining figures for the youngest cohort that married under 10 years ago, we observe that Egypt appears to have transitioned into a late marrying regime, the mechanisms of which are not clear, and shows a significantly smaller first birth interval (15.85 months, S.D. =10.51) and women married at the mean age of 20.52 years (S.D.=4.1). Contraception in Egypt remained near zero. In Bangladesh, on the other hand, while age at marriage remained low even in the younger cohort (16.54 years, S.D.=3.12), birth intervals appear to have declined, though only in relative terms s(21.72 months for the youngest cohort). Strikingly, contraceptive use at the first birth interval had sky rocketed to 38%. Given the consistency in the relationship between age at first marriage and first birth interval that we observe, it is likely that the increase in age at marriage that occurred in Bangladesh between

these cohorts also led to a correlated decline in first birth interval. It is likely however that declines such as those seen in Egypt were not realized because of the remarkable spread and use of contraceptives and particularly in the first birth interval. With no tangible variation in older cohorts of women, we turn our attention to the youngest cohort for our multivariate and multilevel analysis. We present findings in the following section from the preliminary model specifications described earlier.

Multivariate Models for Younger Cohort (Married under 10 years ago)

The older cohort of women who married and started bearing children over three decades ago in both settings, faced highly conservative norms, lower ages at marriage and virtually no access to contraception during the first birth interval in both settings. However, with the advent of contraceptives as a result of population policies and family planning initiatives around the world in the last several decades, even the most conservative societies have become more accepting of these practices, resulting in non-trivial increases in the use of contraceptives during the first birth interval in various settings. In our two settings, this trend has been stark, particularly for Bangladesh than for Egypt, where uptake remains very low. With the higher prevalence of contraceptives, we propose that the hypothesized relationships between the biological and social norms based influences on first birth interval as described earlier would be altered. Our expectation is that contraceptive use during the first birth interval would, at the minimum, dilute the negative relationship between age at first marriage and the first birth interval, if not substitute it, as the major driver of first birth intervals for this cohort. In order to explore this contrast, we use the cohort of very young women from Egypt and Bangladesh who were married under 10 years ago. While age at marriage has increased in both settings as seen in results from Figure 2 and Table 2, these two countries have, more recently, come to represent distinctly different late and early marriage regimes. Tables 3 and 4 present the findings from a set of sequential models for this cohort for as described in the empirical strategy section. As described above, the sequential models start with a parsimonious specification of covariates, which then in each sequential model are subjected to a more restrictive specification with the addition of additional explanatory variables: age at first marriage, age at first marriage at the societal level, and the use of contraception during the first birth interval. These variables are entered individually and then in a final model, simultaneously.

In the results for Bangladesh presented in Table 3, we first observe a clear indication that, individual level age at first marriage is significantly negatively associated with the length of the first birth interval, confirming much what we have seen in our own analysis and consistently across the literature. This association however is substantially small in magnitude; the decline in length of first birth interval with a

one-year increase in age at marriage is under 1 month across the sequential models[3]. We instead find that the variable indicating a social norm effect at the division level is highly significant and accounts for a substantially larger proportion of the change in length of first birth interval than individual age at marriage. This is potentially an indication that the influence of individual level effects, proxying a more fundamental biological influence on first birth interval, may have declined for the younger cohort. More importantly, we observe that the use of contraception during the first birth interval is highly significantly associated with a longer first birth interval and accounts for the largest variation in the first birth interval (approximately 5 months longer when contraception is used). These significant associations persist throughout the models and remain highly significant (at the 1% level), including in the model that includes all three constructs. This result is particularly important, as it is an unequivocal indication that the advent of contraception and its use during the first birth interval is instrumental in delaying first birth for cohorts of women who have access to it. It also indicates that the influence of contraceptive use during this period exceeds the influence of social norms or even fundamental biological factors in determining the first birth interval. This finding suggests that in contraceptive use in an early marrying regime like Bangladesh may be more instrumental in delaying childbirth and that bigger gains may be possible with the promotion of contraceptive use during the first birth interval in such settings.

The finding from the younger cohort in Bangladesh that social norms related influences were significant only for this group but not for the older cohort (multivariate results for older cohort not shown due to small number of significant coefficients, available upon request) is particularly interesting as well. This finding, which indicates that social norm influences are *only* manifesting among younger women who have access to contraceptives, but not among older cohorts who didn't have such widespread access, might be an indication that social norms influences are in fact *driven by* contraceptive use during the first birth interval. In other words, contraceptive use during the first birth interval might be a critical component of the social norms that are emerging in early marrying societies that influence the later timing of first birth seen in such settings. These norms are likely to transcend our operationalization of norms at divisional or district levels to higher levels. We explore these possibilities further in a set of forthcoming models on the determinants of contraceptive use in both regimes.

Before we move to those models, Table 4 presents identical models for the younger cohort in Egypt. One notable contrast between the younger cohort in Egypt and in Bangladesh is that contraceptive use during the first birth interval in Egypt is still extremely low, even for this young cohort (see Table 2). The results in the models for Egypt are similar to that in Bangladesh. Among this younger cohort in Egypt, we find that a

[3] This magnitude is considerably smaller than the magnitude of the coefficient observed in the identical models run for older cohorts (b=2.8 months). In the interest of brevity, these results are not shown here but are available upon request.

higher age at marriage at the individual level still consistently is associated with a shorter first birth interval, but much like in the results for Bangladesh. The influence of this individual level effect appears to be small as indicated by the magnitude of this association (0.2 months). The variable indicating a social norms influence at a higher level surprisingly does not show significant associations in the sequential models. Contraceptive use during the first birth interval on the other hand was highly significant in models that included it independently and in conjunction with both individual level and social norms related variables, with use of contraception during the first birth interval being associated with an increase in the first birth interval of about 1 year (between 11 to 12 months across models). This result is significant and a combination of these findings point to two potential possibilities: a) the finding that social norms / marriage regime related influences are not significant could be an indication that in late marrying societies like Egypt, where women marry during a very fecund period of their lives, that biological factors that may be more critical in determining the first birth interval and that social norms regarding the timing of first birth may not emerge as important drivers of the first birth interval due to the already strong independent individual influence of factors such as the impatience to establish fertility and the compensating behavior described earlier in this paper, and b) that even while contraceptive is low in a setting like Egypt, that when they are available, they can emerge as an important determinant of a longer birth interval in a setting that traditionally has short first birth intervals. The implications for policy in this kind of a setting maybe that even though the resistance to contraceptives is high, that the effort to promote contraception in these societies might yield significant gains in delaying first births. But under the circumstances, since marriage is already late and women are well into their childbearing years when they marry, another mechanistic way to delay first birth is simply to promote later marriage.

Determinants of Contraceptive Use during first birth interval: Younger Cohort

Owing to the finding that contraceptives usage during the first birth interval among the younger cohort are significant influences on the length of the first birth interval and that the use of contraception accounts for a significant proportion of the variation in the first birth interval compared to social norms factors or individual factors (particularly in our early marrying setting, Bangladesh), we estimate one more set of models that estimate the determinants of contraceptive use during the first birth interval. Our assertion is that contraceptive use during the first birth interval might be a key component of the emergent social norm that results from patterns in age at marriage and length of first birth interval, particularly in early marrying settings where first birth intervals have been typically longer, like in Bangladesh. To this effect, we would then expect that contraceptive use and uptake during the first birth interval among a younger cohort of women is influenced by social norms related to longer birth intervals and early marriage among an older cohort of women (their mother's generation). These influences are expected to transmit normative elements

across generations to influence first birth interval in a younger generation. Our two cohorts of data are uniquely suited for this analysis. These analyses, which are run sequentially as the previous models, allow us to analyze norms demarcated by age cohort within the same model while exploiting regional / division level differences at the same time. We estimate these models for both settings even though we expect these relationships to play out more prominently in the early marrying setting since our findings suggest that social norms are not a significant influence on first birth intervals in our late marrying case. This also is in line with our focus on explaining why birth intervals remain long in early marrying settings. In these models, we estimate logistic regressions with contraceptive use at zero parity as the dependent variable and using division level indicators (means) of first birth interval and age at first marriage for an older cohort of women (women married for over 30 years) to proxy for social norms as explanatory variables. The models will also include a similar set of covariates used in earlier models. These models are only estimated for the cohort of women who were married under 10 years ago and can be written out as follows:

Use of Contraceptives at 0 Parity of Youngest Cohort (Y) = β_0 + $\beta_{1\,(Level\ 1)}$ (Individual Age at First Marriage) + $\beta_{2\,(Level\ 1)}$' X + $\beta_{3(Level\ 2)}$ (District/Division Mean of Age at Marriage of Oldest Cohort)+ $\beta_{4(Level\ 2)}$ (District/Division Mean of First Birth Interval of Oldest Cohort)+ ε

The results from these models are shown in Tables 5 and 6. In results for Bangladesh shown in Table 5, we find that our hypotheses are confirmed. The odds ratios observed in these models indicate that all relationships are in the expected direction, showing that schooling, wealth and urban residence are all associated with higher likelihood of the use of contraception during the first birth interval. More importantly, the results show that our hypothesis that social norms-related to longer first birth intervals and early marriage that emerge out of an older cohort of women (mother's generation) will significantly influence the higher use of contraceptives during the first birth interval for a younger group of women (daughter's generation) is confirmed for Bangladesh, an early marrying setting. The association between contraceptive use among young women and the first birth interval related social norm variable for the older cohort is positive and highly significant (odds ratio=1.069, $p<0.01$ for the most restrictive model including all covariates), suggesting that if a longer birth interval was already an accepted practice among an older generation, then it will also lead to a higher uptake of contraceptives among a younger generation of women. Similarly the relationship between the age at first marriage related social norm variable and contraceptive use is negative and highly significant (odds ratio=0.628, $p<0.01$), suggesting that when marriage is early, contraceptive uptake might be higher as function of the number of factors discussed earlier including the absence of expectations to bear children right away when marriage takes place potentially during a time when girls are subfecund. In the same vein, higher age at marriage predicts a lower likelihood of the use of contraception in the first birth interval. Thus, these relationships are observed to play out in the manner that we outlined in

our hypotheses for an early marrying regime. In an extension of this analysis, we also estimated models where social norms related to the younger cohort themselves predicted contraceptive usage (results not shown here). These results indicate that the division level social norms variables for the younger cohort (enumerating means among women who have been married for less than 10 years) have significant independent effects on the uptake of contraceptives during the first birth interval (both division level means for younger women in first birth interval and age at first marriage), but these effects disappear when the normative variables representing the older cohort are introduced to the model (while they themselves remain significant). This indicates that the any normative influences that come from their own cohort might simply be mediated by norms that emerge from older cohorts

Despite expecting for these relationships not to play in the same manner in Egypt as they did in Bangladesh, particularly because we did not observe any evidence for a social norms influence on first birth interval in our earlier models, we nevertheless estimated these models for the late marrying setting where birth intervals are typically shorter. The results, shown in Table 6, are starkly different from those for Bangladesh, with only urban residence predicting a higher likelihood of using contraceptives during the first birth interval. The analogous extension analyses allowing individual higher levels variables to predict contraceptive use did not yield any significant associations either. These disparate findings are striking as it indicates that whatever minimal contraceptive use during the first birth interval that does exist in Egypt can only be attributed perhaps to living in a large city like Cairo and that contraceptives continue to not be accepted even among the youngest groups of married women in Egyptian society. Family planning initiatives or population policies that aim increase uptake of contraceptives in settings such as Egypt are likely to face significant resistance. Thus one of the take away messages from this finding is that for any policy that aims to delay first birth to succeed in a setting like Egypt, it would have to be paired with other policies that the women and the society would be more open to. So potentially, one way this could be achieved in Egypt is to pair the promotion of contraceptive use during the first birth interval to programs that promote an even later age at marriage, which would also delay first birth since childbearing continues to take place within marriage.

V. Conclusions

This analysis relates to two broad and distinct thematic areas of interest in demography. These are the length of the interval between marriage and first birth and the role of social norms in determining variations in the process of demographic change and in explaining the adoption of new behaviors. The paper hypothesizes that when the majority of marriages occur early enough that the woman is subfecund, it leads to a relatively long birth interval. At the individual level, we confirm in all of the analyses conducted that those who marry early have longer birth intervals relative to those who marry late. We also hypothesized that these patterns at

the individual level may have normative implications at a broader societal level. When societies begin to change in terms of childbearing practices, norms can play a part in determining the pace at which new practices such as contraception are likely to be adopted and for what purpose. These norms are likely to have implications for specific policies of promoting contraception my women who have not yet begun childbearing. The paper explores several different ways of conceptualizing norms, varied in space (country, district/ governorate) and cohort (specified by marriage). Some support is found for the notion that early marrying communities are more likely than late marrying communities to subsequently delay first births by adopting contraception before first birth. While this relationship is found to hold and explains variation within Bangladesh across districts that vary in the timing of marriage, it does not hold at the level of country level comparisons between Bangladesh and Egypt. Thus, the analysis suggests that norms are perhaps best understood as an intersection of time and a local level specification of space such as district rather than at the level of the country, which may be too broad. Norms also need to be understood in the context of specific reference communities such as those identified by religion.

The paper offers a partial explanation of variation in contraceptive uptake in the first birth interval in Bangladesh and Egypt as well as the variations within Bangladesh. Varying levels of contraceptive use, age at marriage and consequent fertility levels within countries have long baffled policy-makers and program managers. This paper brings new evidence to light on the role of social norms and their influence on fertility and related behaviors. As such it helps to promote a better understanding on factors help or hinder behavior change in childbearing.

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TABLES 3 – 6

Table 3. Factors Predicting Length of First Birth Interval in Bangladesh (Early Marrying Regime) for Women Married under 10 Years Ago

VARIABLES	Length of First Birth Interval							
Age at First Marriage (Individual)		-0.704***		-0.627***		-0.631***		-0.581***
		(0.125)		(0.122)		(0.123)		(0.121)
District Level Age at First Marriage (Social Norms)			-2.091***	-1.720***			-1.531***	-1.205***
			(0.396)	(0.390)			(0.389)	(0.386)
Used Contraception in First Birth Interval					5.580***	5.312***	5.192***	5.028***
					(0.687)	(0.663)	(0.691)	(0.675)
Never been to School				Omitted Category				
Primary School	3.384***	3.219***	2.909***	2.847***	2.936***	2.810***	2.620***	2.571***
	(0.827)	(0.847)	(0.866)	(0.876)	(0.840)	(0.858)	(0.874)	(0.883)
Secondary School	2.481***	2.495***	1.949**	2.056***	1.402*	1.466**	1.088	1.214
	(0.702)	(0.693)	(0.748)	(0.730)	(0.723)	(0.711)	(0.753)	(0.731)
College/Unviersity	2.249*	4.663***	1.467	3.755**	0.647	2.888**	0.185	2.347*
	(1.298)	(1.445)	(1.335)	(1.467)	(1.207)	(1.354)	(1.242)	(1.369)
Spouse Never been to School				Omitted Category				
Spouse Primary School	-1.223	-1.286	-1.259	-1.309	-1.402*	-1.450*	-1.416*	-1.457*
	(0.788)	(0.792)	(0.792)	(0.795)	(0.777)	(0.779)	(0.780)	(0.782)
Spouse Secondary School	0.041	0.308	-0.025	0.224	-0.650	-0.378	-0.651	-0.400
	(0.872)	(0.871)	(0.846)	(0.851)	(0.813)	(0.812)	(0.795)	(0.800)
Spouse College/University	0.868	1.600	0.449	1.175	-0.114	0.589	-0.352	0.346
	(1.034)	(1.031)	(1.029)	(1.021)	(0.986)	(0.982)	(0.988)	(0.979)
Wealth Index Quintile 1				Omitted Category				
Wealth Index Quintile 2	-0.262	-0.140	0.070	0.119	-0.573	-0.449	-0.309	-0.251
	(0.812)	(0.811)	(0.818)	(0.817)	(0.794)	(0.793)	(0.808)	(0.806)
Wealth Index Quintile 3	0.435	0.596	1.099	1.125	0.177	0.333	0.681	0.718
	(0.982)	(0.956)	(0.939)	(0.929)	(0.932)	(0.911)	(0.914)	(0.906)
Wealth Index Quintile 4	1.759*	2.025**	2.519***	2.621***	1.445*	1.699**	2.023**	2.134**
	(0.916)	(0.885)	(0.918)	(0.894)	(0.858)	(0.831)	(0.865)	(0.845)
Wealth Index Quintile 5	-0.011	0.754	1.352	1.791	-0.059	0.629	0.942	1.362
	(1.266)	(1.182)	(1.136)	(1.111)	(1.146)	(1.084)	(1.090)	(1.069)
Urban	-1.142*	-0.563	-0.271	0.091	-1.334**	-0.805	-0.683	-0.334
	(0.601)	(0.598)	(0.625)	(0.622)	(0.577)	(0.575)	(0.583)	(0.582)
Muslim	-0.813	-1.500	-3.308***	-3.477***	-0.964	-1.572	-2.780**	-2.953***
	(1.120)	(1.082)	(1.191)	(1.189)	(1.010)	(0.997)	(1.090)	(1.097)
Constant	20.320***	31.506***	54.599***	58.477***	20.079***	30.119***	45.192***	49.084***
	(1.263)	(2.309)	(6.598)	(6.739)	(1.182)	(2.315)	(6.452)	(6.697)
Observations	3,069	3,069	3,069	3,069	3,069	3,069	3,069	3,069
R-squared	0.011	0.025	0.021	0.032	0.040	0.051	0.045	0.055

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4. Factors Predicting Length of First Birth Interval in Egypt (Late Marrying Regime) for Women Married under 10 Years Ago

Variable	Length of First Birth Interval							
Age at First Marriage (Individual)		-0.221***		-0.213***		-0.220***		-0.211***
		(0.049)		(0.048)		(0.050)		(0.049)
District Level Age at First Marriage (Social Norms)			-0.298	-0.203			-0.303	-0.209
			(0.185)	(0.186)			(0.186)	(0.186)
Used Contraception in First Birth Interval					12.378***	12.283***	12.421***	12.316***
					(2.421)	(2.388)	(2.379)	(2.356)
Never been to School				Omitted Category				
Primary School	-1.062**	-1.067**	-0.998*	-1.024**	-1.095**	-1.099**	-1.029**	-1.054**
	(0.490)	(0.478)	(0.487)	(0.477)	(0.465)	(0.455)	(0.462)	(0.453)
Secondary School	-1.860***	-1.675***	-1.817***	-1.653***	-1.855***	-1.671***	-1.811***	-1.649***
	(0.373)	(0.375)	(0.370)	(0.372)	(0.365)	(0.369)	(0.362)	(0.366)
College/Unviersity	-3.056***	-2.399***	-3.021***	-2.401***	-3.073***	-2.420***	-3.037***	-2.422***
	(0.524)	(0.502)	(0.520)	(0.504)	(0.521)	(0.504)	(0.518)	(0.506)
Spouse Never been to School				Omitted Category				
Spouse Primary School	-0.351	-0.437	-0.321	-0.413	-0.368	-0.453	-0.337	-0.428
	(0.527)	(0.517)	(0.528)	(0.518)	(0.521)	(0.511)	(0.522)	(0.512)
Spouse Secondary School	-0.463	-0.583	-0.496	-0.600	-0.487	-0.605	-0.520	-0.623
	(0.389)	(0.381)	(0.382)	(0.375)	(0.390)	(0.380)	(0.381)	(0.375)
Spouse College/University	0.142	0.139	0.067	0.088	0.157	0.154	0.081	0.101
	(0.481)	(0.471)	(0.481)	(0.468)	(0.482)	(0.472)	(0.483)	(0.470)
Wealth Index Quintile 1				Omitted Category				
Wealth Index Quintile 2	0.078	0.149	0.164	0.205	0.122	0.192	0.210	0.250
	(0.468)	(0.461)	(0.469)	(0.462)	(0.466)	(0.459)	(0.468)	(0.461)
Wealth Index Quintile 3	-0.567	-0.420	-0.391	-0.306	-0.578	-0.432	-0.399	-0.314
	(0.398)	(0.392)	(0.436)	(0.430)	(0.405)	(0.397)	(0.442)	(0.436)
Wealth Index Quintile 4	-0.060	0.148	0.177	0.302	-0.020	0.186	0.221	0.344
	(0.459)	(0.465)	(0.444)	(0.451)	(0.450)	(0.455)	(0.435)	(0.441)
Wealth Index Quintile 5	0.523	0.778	0.835	0.980*	0.520	0.773	0.837	0.981*
	(0.463)	(0.480)	(0.513)	(0.525)	(0.451)	(0.467)	(0.503)	(0.514)
Urban	-0.193	0.166	0.216	0.431	-0.243	0.114	0.173	0.387
	(0.265)	(0.249)	(0.372)	(0.363)	(0.269)	(0.250)	(0.381)	(0.372)
Constant	17.704***	21.818***	23.113***	25.347***	17.681***	21.768***	23.187***	25.402***
	(0.340)	(1.038)	(3.426)	(3.591)	(0.348)	(1.056)	(3.435)	(3.602)
Observations	6,628	6,628	6,628	6,628	6,628	6,628	6,628	6,628
R-squared	0.009	0.015	0.010	0.015	0.014	0.020	0.015	0.020

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5. Factors Predicting Contraceptive Use during the First Birth Interval including Social Norms emerging out of Older Cohorts in Bangladesh (Early Marrying Regime) for Women Married under 10 Years Ago

VARIABLES	Contraceptive Use during First Birth Interval			
Age at First Marriage (Individual)	0.947***	0.954***	0.972*	0.971*
	(0.016)	(0.016)	(0.017)	(0.016)
District Mean of First Birth Interval of Oldest Cohort (Social Norms)		1.111***		1.069***
		(0.029)		(0.026)
District Mean of Age at First Marriage of Oldest Cohort (Social Norms)			0.546***	0.628***
			(0.069)	(0.083)
Never been to School	Omitted Category			
Primary School	1.706***	1.652***	1.597***	1.575***
	(0.298)	(0.296)	(0.273)	(0.274)
Secondary School	3.131***	2.992***	2.849***	2.812***
	(0.601)	(0.584)	(0.532)	(0.527)
College/Unviersity	5.393***	5.073***	4.368***	4.360***
	(1.390)	(1.313)	(1.107)	(1.108)
Spouse Never been to School	Omitted Category			
Spouse Primary School	1.497***	1.534***	1.548***	1.548***
	(0.178)	(0.186)	(0.191)	(0.191)
Spouse Secondary School	2.080***	2.132***	2.082***	2.111***
	(0.251)	(0.254)	(0.261)	(0.259)
Spouse College/University	2.947***	3.017***	2.663***	2.766***
	(0.424)	(0.439)	(0.406)	(0.411)
Wealth Index Quintile 1	Omitted Category			
Wealth Index Quintile 2	1.223*	1.245*	1.355***	1.344***
	(0.132)	(0.139)	(0.142)	(0.146)
Wealth Index Quintile 3	1.348**	1.420**	1.628***	1.610***
	(0.201)	(0.204)	(0.237)	(0.228)
Wealth Index Quintile 4	1.315*	1.342**	1.642***	1.581***
	(0.203)	(0.196)	(0.251)	(0.233)
Wealth Index Quintile 5	1.101	1.235	1.600***	1.570***
	(0.226)	(0.223)	(0.269)	(0.252)
Urban	1.239*	1.293***	1.595***	1.540***
	(0.140)	(0.127)	(0.209)	(0.183)
Muslim	1.153	1.185	0.594*	0.688
	(0.227)	(0.254)	(0.175)	(0.199)
Observations	4,052	4,018	4,018	4,018
Log Likelihood	-2455	-2386	-2373	-2358
DF	13	14	14	15
Chi Squared	290.5	432.2	429.1	482.4

Robust SE in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6. Factors Predicting Contraceptive Use during the First Birth Interval including Social Norms emerging out of Older Cohorts in Egypt (Late Marrying Regime) for Women Married under 10 Years Ago

VARIABLES	Contraceptive Use during First Birth Interval			
Age at First Marriage (Individual)	0.973	0.971	0.969	0.969
	(0.032)	(0.033)	(0.033)	(0.032)
District Mean of First Birth Interval of Oldest Cohort (Social Norms)		0.952		0.981
		(0.076)		(0.112)
District Mean of Age at First Marriage of Oldest Cohort (Social Norms)			1.129	1.096
			(0.136)	(0.181)
Never been to School		Omitted Category		
Primary School	1.351	1.330	1.321	1.320
	(0.860)	(0.861)	(0.841)	(0.844)
Secondary School	1.077	1.080	1.076	1.077
	(0.610)	(0.613)	(0.609)	(0.608)
College/Unviersity	1.728	1.745	1.753	1.753
	(1.006)	(1.019)	(1.034)	(1.033)
Spouse Never been to School		Omitted Category		
Spouse Primary School	2.451	2.408	2.408	2.402
	(1.743)	(1.664)	(1.675)	(1.656)
Spouse Secondary School	2.118	2.132	2.148	2.146
	(1.276)	(1.293)	(1.306)	(1.297)
Spouse College/University	1.195	1.212	1.225	1.224
	(1.023)	(1.061)	(1.069)	(1.067)
Wealth Index Quintile 1		Omitted Category		
Wealth Index Quintile 2	0.380	0.371*	0.367*	0.367*
	(0.229)	(0.219)	(0.221)	(0.221)
Wealth Index Quintile 3	1.370	1.295	1.256	1.256
	(0.650)	(0.600)	(0.568)	(0.569)
Wealth Index Quintile 4	0.646	0.607	0.583	0.583
	(0.291)	(0.293)	(0.293)	(0.293)
Wealth Index Quintile 5	1.292	1.196	1.134	1.136
	(0.706)	(0.701)	(0.643)	(0.641)
Urban	3.348***	3.111***	2.817***	2.858***
	(1.045)	(1.017)	(0.945)	(0.910)
Observations	8,247	8,247	8,247	8,247
Log Likelihood	-215.8	-215.6	-215.5	-215.5
DF	12	13	13	14
Chi Squared	28.92	36.53	31.82	38.46

Robust SE in parentheses
*** p<0.01, ** p<0.05, * p<0.1