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Measurement of Unintended Pregnancy in Rural Bangladesh

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ABSTRACT

Estimates of unintended childbearing often rely on women's retrospective reports of pregnancy intention, which are widely thought to be unreliable given women's reluctance to report a pregnancy as unwanted after the birth of the child. This study takes advantage of a relatively large longitudinal study in rural Bangladesh that collected women's prospective and retrospective reports of pregnancy intentions. Estimates of the unintended pregnancy rate are calculated using both forward and backward measures and correlates of switching intention status from wanted prospectively to unwanted retrospectively are explored. The unwanted pregnancy rate in this population is 42 percent measured prospectively and 20 percent measured retrospectively. More than 60 percent of women who said they wanted no more children in 2006 reported births during the three-year inter-survey period as either wanted or mistimed. Measures of pregnancy intention should be refined to more accurately measure family planning program performance and better understand the risks of unintended pregnancy.

INTRODUCTION

The primary goal of family planning programs is to prevent unintended pregnancies. It follows that the level of unintended pregnancy in a given population is often used as a marker of the effectiveness of family planning programs. Fertility and family planning surveys almost always include questions about unintended childbearing; however, most of these types of studies in less developed countries (LDCs) are cross-sectional and measures of unintended pregnancy are based on the retrospective report of the intention status of a woman's current pregnancy or most recent birth. Even among prospective studies that have assessed pregnancy intentions and outcomes, very few have explored the reliability of standard measures of childbearing intentions, particularly in LDCs.

Over the past four decades, several studies in a variety of settings have shown that, at the population level, women's fertility intentions fairly accurately predict their future fertility and that these intentions remain largely stable over time (Westoff & Ryder, 1977; Hermalin et al., 1979; Foreit & Suh, 1980; Nair & Chow, 1980; De Silva, 1991; Vlassoff, 1990; Bankole & Westoff, 1998; Schoen et al., 1999; Roy et al., 2008; Kodzi et al., 2010). Other studies have shown that the predictive value of standard fertility intention questions, however, depends on whether couples' fertility preferences are considered or only the woman's (Thompson et al., 1990; Tan & Tey, 1994; Bankole, 1995; Thomson, 1997; Miller et al., 2004; Gipson & Hindin, 2009). In combination with contraceptive use data, prospective fertility intention data, specifically the proportion of women who report wanting no more children or wanting to postpone childbearing, are widely used to measure unmet need for family planning (Westoff & Bankole, 1995). Across populations, the proportion of women who say they would like to

prevent future births is closely associated with levels of contraceptive use and the general fertility rate (Bongaarts, 1997).

While the utility of prospective measures of fertility intentions is clear, most large-scale fertility and family planning surveys such as the DHS and U.S. National Survey of Family Growth (NSFG) also collect retrospective data on pregnancy and childbearing intentions. Women who have given birth or are pregnant at the time of the survey are asked whether, at the time they became pregnant, the pregnancy was wanted then, wanted later, or not wanted at all. Data from these questions have been used to estimate levels of unintended pregnancy in different populations (Westoff & Bankole, 2002; Adetunji, 1998). Such data have also been used to assess the effects of pregnancy intention on maternal and infant health outcomes (Marston & Cleland, 2003; Gage, 1998; Eggleston, 2000; Brown & Eisenbeg, 1995).

Several critiques have been levied against using retrospective reports of fertility intentions to estimate unintended childbearing including the inherent exclusion of aborted pregnancies (since women are generally only asked about the planning status of their last birth) and the dichotomization of pregnancy intentions into "intended" and "unintended" when, in fact, pregnancy intentions more likely fall on a continuum (Santelli et al., 2003; Bachrach & Newcomer, 1999). Many argue, however, that the most important shortcoming of retrospective reports of intentions is the *ex post* rationalization of births as wanted, i.e., that respondents are less likely to report a birth as unwanted or unintended once the child is born than before pregnancy occurs (Westoff & Ryder, 1977; Bankole & Westoff, 1998; Koenig et al., 2006; Joyce et al., 2000 & 2002).

The proportion of women who reported prospectively that they wanted no more children but who retrospectively reported that a subsequent birth was intended ranges from 28 to 50 percent in US-based studies (Westoff, 1980; Joyce et al., 2002; Wiliams & Abma 2001; Poole et al., 2000). Only two comparisons of prospective and retrospective reports of pregnancy intentions have been conducted in less developed countries. Using data from a panel DHS carried out in Morocco in 1992 and 1995, Bankole and Westoff (1998) found that of the 140 last births described as "unwanted" in the 1992 survey, 43 percent were reclassified as "wanted" in 1995. It should be noted that these results do not really describe *ex post* rationalization of births since both the 1992 and 1995 reports were retrospective referring to existing children and not a comparison of intention status before and after the child's birth. They do exemplify, however, the relatively poor reliability of this retrospective measure of birth intention status and the increased likelihood that women will report a birth as wanted as the child ages.

More recently, Koenig et al. (2006) used longitudinal data from rural India to compare prospective and retrospective reports of pregnancy intentions. Consistent with previous studies, they found considerable post-birth rationalization with only 30 percent of the 645 births prospectively identified as unwanted also classified as unwanted when asked about them retrospectively. They also found that discrepancies in reporting were positively associated with younger maternal age, lower parity, older age of the index child, the index child being male, and the woman's perception that her husband wants more children.

The present study takes advantage of an unusual longitudinal study involving a relatively large sample of rural Bangladeshi women to compare prospective and retrospective reports of pregnancy intentions and explore correlates of post-birth rationalization. We hypothesize that: 1) the level of unintended pregnancy is higher in this population when measured prospectively

compared with retrospective reports; 2) post-birth rationalization is associated with the sex and age of the reference child; and 3) women who believe their fertility preferences match those of their husbands at baseline are less likely to switch intention status of their last birth.

METHODS

Data Source & Setting

The analyses described here use data from the Bangladesh Microcredit and Health Study (BMHS), an experimental study designed to measure the relative effects of separately and jointly introducing additional microcredit activities and basic health services on the use of health services, economic well-being, and women's empowerment. The study was conducted in 128 rural villages in three Divisions of Bangladesh (Chittagong, Dhaka, and Rajshahi). Villages were eligible to be chosen for the study if less than 50 percent of households were reported to be participating in microcredit activities and if the village only had government health programs[1]. The study included a household baseline survey conducted in 2006 and an endline survey conducted three years later in 2009. Prior to the baseline survey, a census was conducted in the chosen 128 villages to categorize households into three strata based on their microcredit eligibility and current involvement in microcredit activities: 1) not eligible, 2) eligible and involved and 3) eligible and not involved. A random sample of households with ever-married

[1] The study was conducted in cooperation with the Grameen Health Program, which has established health centers in selected small town and village market areas in rural Bangladesh. Villages considered for this study were located outside the catchment areas of these health centers and, thus, considered remote. Of the 31 Grameen health centers located in the Chittagong, Dhaka, and Rajshahi Divisions, the 16 centers with the lowest reported coverage with microcredit activities were first selected. For each of the 16 centers, two sets of four villages were selected in opposite directions from the Grameen health center (16 health centers * 4 villages * 2 = 128 villages).

women was then taken in each village with women interviewed in households sampled from each of these three strata. The sample sizes chosen were: 4, 12, and 15 women from strata 1, 2, and 3, respectively. Sampling weights were calculated based on the sample and census information and the survey response rate. These weights are used in the present analysis.

The baseline and endline surveys included largely identical community, household, and woman's questionnaires. The woman's questionnaire included a birth history, details about maternal and child health care including contraceptive use, microcredit participation, and relevant socio-economic data. Much of the woman's questionnaire was modeled after the Demographic and Health Survey questionnaires including the use of a contraceptive calendar. In the BMHS the calendar was used to collect data on all pregnancies, pregnancy outcomes, and contraceptives used during the forty months prior to the baseline survey and the 43 months prior to the follow-up survey. Birth histories and information on future pregnancy intentions were gathered from currently married women who were less than 50 years old.

The household response rate for the baseline survey was 91.3 percent and the eligible woman response rate was 98.7 percent. Of the 3,933 women who were interviewed at baseline, 3,687 (93.7 percent) completed the follow-up survey. The response rate for the follow-up interviews is unusually high because we instituted tracking of households and women who had moved since 2006. Women lost to follow-up were broadly similar to those completing both surveys, except those not completing the second survey were younger and had fewer children than women who completed both.

Measurement of Unintended Pregnancy

As in the DHS, women who did not report that they were sterilized or that their husbands were sterilized were asked, "Would you like to have (a/another) child, or would you prefer to not have any (more) children?" Women who were pregnant at the time of the survey were asked: "After the child you are expecting now, would you like to have another child, or would you prefer not to have any more children?" Women who said that they did not want to have another child but went on to have a pregnancy during the period between the baseline and follow-up surveys are considered to have had an unwanted pregnancy. Unfortunately, unlike in the DHS, women who expressed a desire for additional children were not asked when they would like to have another child so we are unable to calculate a prospective measure of mistimed pregnancy in this population.

In 2009, all women who had ever experienced a live birth or were pregnant at the time of the survey were asked, "At the time you became pregnant with your last (this) pregnancy did you want to become pregnant then, did you want to wait until later, or did you not want to have any (more) children at all?," providing a retrospective measure of unintended pregnancy.

Figure 1 describes the sample of 725 women whose prospective and retrospective reports of pregnancy intention we compare. To be included in the final sample, women had to meet the following criteria: completed both surveys, married at the time of both surveys, less than 50 years old at the time of the follow-up interview, not sterilized (and husband not sterilized), reported being fecund at baseline, and did not experience an abortion, miscarriage or stillbirth during the inter-survey period. Non-live births were not included in the analysis because the retrospective question on intendedness only referred to live births. Women who reported not

being married were not asked about the planning status of prior pregnancies. Women were included if they either 1) had one birth during the inter-survey period and were not pregnant at the time of either interview (N=631), 2) had two births and were pregnant at the time of the baseline survey (N=30)[2] or 3) had no births but were pregnant at the time of the follow-up interview (N=64)[3].

(FIGURE 1 ABOUT HERE)

To explore the factors associated with post-birth rationalization, we use logistic regression with consistency of intention status as the outcome measure. Women who prospectively said they wanted no more children and retrospectively reported their last birth as unintended are assigned a '0' for the consistency of report variable while women who switched their report from unintended to intended are coded as '1'. Since we are specifically interested in the measurement of unintended pregnancy, this analysis is restricted to women who reported at baseline that they did not want any more children but went on to have a birth during the inter-survey period (N=348).

RESULTS

Background characteristics of the study population at baseline are given in Table 1. Women who had a live birth during the three year period between the baseline and follow-up

[2] Women who were pregnant at the time of the 2006 survey were asked about desire for another child after the current pregnancy.

[3] Women were asked in 2009 about the planning status of the current or last pregnancy.

surveys (or who had no births but were pregnant at the time of the follow-up survey) had an average age of 24 years and 2.2 prior births. Nearly a quarter had never attended school and 44 percent had reached at least grade 6. The average wealth index of -0.13 is the mean score based on a previously constructed asset index and is relative to the entire study population[4].

Both ever use and current use of contraception were high in this population in 2006 at 84 and 67 percent, respectively. Less than one percent reported having ever had menstrual regulation and 21 percent had experienced either a stillbirth or the death of a child. The average decision-making score, based on a previously defined scale ranging from 0-20, was 17.5. [5]

(TABLE 1 ABOUT HERE)

Of the 725 women who had at least one birth during the inter-survey period (or were pregnant at follow-up), 58 percent said at baseline that they wanted another child, 35 percent said they did not want another and six percent were unsure. When the same women were asked about the planning status of their last birth (or current pregnancy) during the follow-up survey, the percent who said the birth was wanted at the time increased to 68 percent, 12 percent said their last birth was mistimed and a fifth said the birth was unwanted (Table 2). The unwanted

[4] The household asset index was constructed from multiple binary indicators including presence or absence of electricity, wardrobe, table, chair, clock, bed, radio, television, at least one of motorcycle, sewing machine or telephone, brick, cement or tin walls, modern toilet or pit latrine. In addition, the ratio of the number of people in the household to the number of rooms in the house was included. Principal components' analysis was used to combine the asset indicators and household density figure into an asset index that was assigned to each respondent (Amin et al., 2010).

[5] In the baseline survey, women were asked who in their family has a say and, subsequently, who has the final say on decisions related to the following: buying costly furniture such as cot or wardrobe; buying or selling cows/goats; how to spend family savings; whether to take a loan; treatment when children are sick; whether to visit a doctor when the respondent is sick; whether the respondent can work for money outside the home; the respondent visiting her father's home; whether to have another child or stop; and whether or not to use family planning. For each of the 10 items the woman received a score of 0 if she reported that she did not participate in the decision, 1 if she reported that she contributes to the decision and 2 if she reported herself as the first or second most important person in actually deciding. These value scores for each item were then summed to come up with the average decision-making score (Mahmud et al., 2011).

pregnancy rate in this population is 41.7 percent when measured prospectively and 19.9 percent when measured retrospectively. If births retrospectively classified as mistimed are considered unwanted, the retrospective unwanted pregnancy rate increases to 32 percent.

(TABLE 2 ABOUT HERE)

Table 3 shows that of the 377 women who said at baseline that they *wanted* another child, 80 percent retrospectively classified their births as wanted at the time, 14 percent said that their birth occurred too soon and six percent reclassified their birth as unwanted. Among those who had reported that they *did not want* any more children at baseline, 45 percent maintained that the birth was unwanted when asked retrospectively; another 46 percent reclassified their births as wanted at the time and nine percent said their births were mistimed. When women who were unsure at baseline if they wanted any more children are included with those who said they wanted no more and retrospective reports of mistimed births are included with those classified as unwanted, more than half of women (52.2 percent) in this population switched their intention status from unwanted prospectively to wanted retrospectively (left panel of Table 4). If births retrospectively classified as mistimed are considered wanted, the percent of women switching intention status from unwanted to wanted increases from 52 to 61 percent (right panel of Table 4).

(TABLES 3 & 4 ABOUT HERE)

Table 5 shows that women who were younger, had fewer children, were not using family planning in 2009, and have experienced the death of a child have a higher odds of switching the classification of a birth from unwanted to wanted when asked before compared with after the child is born. When the reference child is older than two years, women are also more likely to

reclassify it as wanted when asked retrospectively. There is no association between sex of the reference child and odds of switching wantedness status.

(TABLE 5 ABOUT HERE)

DISCUSSION

The present analysis represents one of the few attempts to compare prospective and retrospective reports of pregnancy intentions in a less developed country setting and the first to our knowledge in Bangladesh. Similar to studies in the US, Morocco, and India, we found considerable discordance in prospective and retrospective reports of wantedness of births. Considering only births classified as unwanted (not mistimed), the prospective unwanted pregnancy rate is 42 percent in this population compared with 20 percent using the retrospective measure. More than half of the women who said at baseline that they wanted no more children but nevertheless went on to have a birth reported at follow-up that this last birth was intended. This indicates that the overall population rates of unintended pregnancy mask considerable switching of intentions at the individual level most of which represents rationalization of births retrospectively. Only six percent switched their intention status from wanted to unwanted and 14 percent from wanted to mistimed. If post-birth rationalization were not at work, we would expect that changes in intention status would be approximately the same in both directions.

It should be pointed out that the DHS does acknowledge that the retrospective question about pregnancy intentions is problematic because of the potential rationalization of births as wanted and these data are not used by the DHS to estimate unwanted fertility rates. Rather, the DHS bases these rates on women's reports of their ideal number of children, i.e., each birth in

the five years proceeding the survey is classified as wanted or unwanted by comparing women's reported ideal number of children to the number of living children at the time of conception. While this method has been shown to classify more births as unwanted than the single retrospective question on intention status, the method still suffers from a kind of post-birth rationalization in that women may be reluctant to report an ideal number of children lower than their current number of living children (see Casterline & El-Zeini 2007 for a more thorough description of methods for estimating unwanted fertility).

A limitation of our study is that we cannot prospectively estimate mistimed pregnancy since women who said at baseline that they wanted another child were not asked about their timing preferences. About 15 percent of women in our sample retrospectively classified their births as mistimed, but we do not know how many of those women would have said, if asked at baseline, that they wanted a child no sooner than two years in the future. Whether we retrospectively classify these women as having an unintended pregnancy or not does have a substantial impact on the unintended pregnancy rate, however. If they are included, 32 percent of women would be classified as having an unintended birth and if they are not included the retrospective unintended pregnancy rate falls to 20 percent, leading to a much larger difference in the prospective and retrospective rates. Furthermore, the prospective level of unintended pregnancy would have been higher if women who did not want a birth in the near future were included.

While retrospective reports of pregnancy intention almost certainly result in a lower population estimate of unintended pregnancy compared with prospective reports, the true level in most populations likely falls somewhere in between (since some women will experience a true change in their pregnancy intentions over time). The important question for research and

programs is how much of an effect does the retrospective underestimation of unintended pregnancy have on our ability to detect associations between unintended pregnancy and maternal and child health outcomes and to measure the effectiveness of family planning programs in reaching those in need. A recent review of the effects of unintended pregnancy on infant, child and prenatal health by Gipson et al. (2008) highlights the mixed findings among relevant studies and points out the need for more nuanced measures of "unintendness". The authors specifically point out both the problems of rationalization in retrospective reports of intentions as well as the combining of unwanted and mistimed into a single measure of unintendness which "may blur the individual effects of these distinct classifications of pregnancy intention, thereby underestimating the true effect of 'unwantedness,' and overestimating the effect of being 'mistimed'" (Gipson et al., 2008, pg. 19). In terms of family planning program effectiveness, use of a retrospective measure of unintended pregnancy likely overestimates the success of programs in reaching potential clients if declines are taken as an indicator of success.

Additional research is needed to determine how much the rationalization of births as wanted distorts the true level of unintended pregnancy. Our results indicate that young women and those of lower parity are more likely to switch their report of birth intentions from unwanted to wanted, a possible sign that they are more ambivalent about becoming pregnant than older women of higher parity. Others have found considerable ambivalence in reports of pregnancy intentions and point out that current measures of pregnancy intention do not accurately capture the complex set of factors that affect fertility decision-making (Zabin, 1999; Trussell et al., 1999; Santelli et al., 2003). More nuanced questions, both prospective and retrospective, about pregnancy intentions including women's feelings and attitudes about pregnancy may help researchers produce more accurate estimates of unintended pregnancy and better explore

associations between unintended pregnancy and negative health outcomes. In their analysis of pregnancy intentions measures using US data, Santelli et al. (2009) found that desire to become pregnant and mistiming of pregnancy make up two distinct dimensions of pregnancy intentions. They recommend that these dimensions be explored in other populations and that questions that tap into these dimensions - including happiness at becoming pregnant and degree of mistiming - be incorporated into the DHS and other reproductive health surveys. We agree with these recommendations and suggest that the DHS program adopt retrospective intentions questions currently used in the NSFG including whether or not a woman felt happy about becoming pregnant, if she (and her partner) were trying to become pregnant, and the woman's perception of her partner's intentions. With more accurate measures of pregnancy intentions, researchers and program planners will gain a better understanding of the risks of unintended pregnancies and be able to more effectively meet women's and couple's needs for pregnancy prevention.

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TABLES & FIGURES

Figure 1: Flowchart for the sample of married women who were asked prospectively and retrospectively about the planning status of single birth or pregnancy between 2006 and 2009

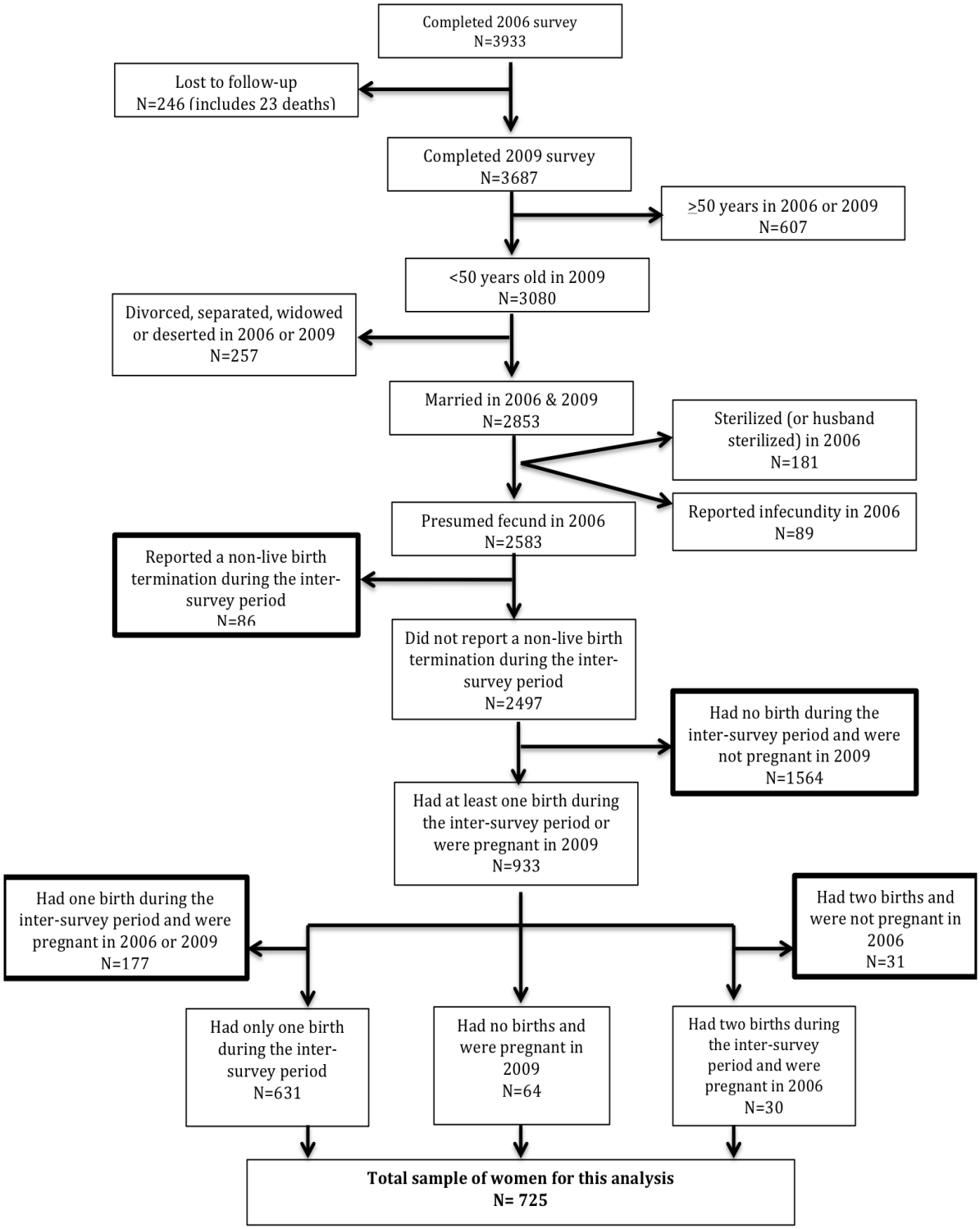

Table 1: Characteristics (mean or percent and 95% CI) of study sample and comparable group who did not experience a birth or pregnancy during the inter-survey period[1]

	Study Sample (N=725)	Comparable Group (N=1858)
Mean Age (years)	23.8 (22.9-24.7)	31.0 (30.1-31.9)
Mean Parity	2.2 (1.9-2.5)	3.2 (2.9-3.4)
Schooling		
None	23.6 (17.4-31.2)	37.4 (31.3-43.7)
Primary	32.3 (25.5-39.9)	28.1 (22.0-35.0)
Secondary or higher[2]	44.1 (35.5-53.2)	34.6 (27.3-42.7)
Husband ever attended school	66.7 (57.7-74.7)	62.1 (55.3-68.5)
Wealth index[3]	-0.13 (-0.62-0.36)	0.55 (0.23-0.87)
Religion		
Muslim	95.1 (87.5-98.2)	95.9 (93.1-97.6)
Hindu	4.7 (1.7-12.5)	4.0 (2.3-6.8)
Ever used FP	84.2 (77.3-89.3)	90.0 (85.6-93.2)
Current FP use	67.0 (58.0-74.9)	76.0 (68.3-82.3)
Ever had menstrual regulation	0.9 (0.2-3.1)	2.3 (1.0-5.4)
Ever experienced stillbirth or child death	20.9 (14.1-29.9)	25.7 (20.6-31.7)
Would like to have another child	58.3 (49.6-66.5)	26.0 (21.5-31.0)
Mean decision-making score[4]	17.5 (16.6-18.3)	17.9 (17.5-18.4)

Adjusted for sample design

[1]Study sample described in Figure 1. Comparable group includes those in highlighted boxes in Figure 1.

[2]Secondary education includes 6th grade and above

[3]Wealth index ranges from -4.32-3.58. See footnote 2 for explanation.

[4]Decision-making score ranges from 0-20

Table 2. Prospective and retrospective assessment of pregnancy intentions among rural Bangladeshi women, 2006-2009 (N=725)

Intention status of birth	Prospective assessment in 2006	Retrospective assessment in 2009
Wanted	58.3	68.2
Wanted later	--	11.9
Not wanted	35.3	19.9
Unsure	6.4	--
ALL WOMEN	100.0	100.0

Table 3: Percent distribution of retrospective reports of pregnancy wantedness by prospective intentions among rural Bangladeshi women, 2006-2009 (N=725)

Prospective Assessment in 2006	Retrospective Assessment in 2009				
				Total	
	Wanted	Mistimed	Unwanted	%	N
Wanted	79.7	14.2	6.1	100	377
Unwanted	45.8	9.0	45.2	100	313
Unsure	87.5	7.3	5.2	100	35
ALL WOMEN	447	103	175	100	725

Table 4: Percent distribution of retrospective reports of pregnancy wantedness by prospective intentions according to classification of mistimed births among rural Bangladeshi women, 2006-2009 (N=725)

Prospective Assessment in 2006	Retrospective Assessment in 2009						
	Classifying mistimed births as unwanted			Classifying mistimed births as wanted			
	Wanted	Unwanted	%	Wanted	Unwanted	%	N
Wanted	79.7	20.3	100	93.9	6.1	100	377
Unwanted	52.2	47.8	100	60.9	39.1	100	348
ALL WOMEN	447	278	100	550	175	100	725

Table 5: Estimated unadjusted and adjusted odds ratios and 95% confidence intervals from logistic regression analysis of switching report of birth from "unwanted" or "unsure" prospectively to "wanted"[1] retrospectively (N=348)

	Model	
Covariate	Bivariate	Multivariate
Age	0.90 (0.81-1.01)*	0.49 (0.27-0.87)**
Age^2	1.00 (1.00-1.00)	1.01 (1.00-1.02)**
Parity	0.61 (0.43-0.87)**	0.53 (0.36-0.77)**
Household economic status[2]		
Poorest (ref)	1.00	1.00
Middle	0.67 (0.25-1.81)	0.63 (0.23-1.67)
Wealthiest	1.58 (0.53-4.70)	1.48 (0.56-3.89)
Ever attended school	1.18 (0.46-3.03)	0.65 (0.28-1.51)
FP use at follow-up	0.24 (0.09-0.6)**	0.31 (0.11-0.86)**
Ever experienced child death or stillbirth	4.23 (1.35-13.28)**	5.27 (1.96-14.21)**
Male sex of index child	1.83 (0.62-5.40)	0.79 (0.31-2.00)
Child older than 2 years	1.01 (0.31-3.24)	3.47 (1.26-9.55)**
Believes fertility preferences match those of her husband	0.23 (0.08-0.66)**	0.57 (0.21-1.55)
F-adjusted test statistic (prob>F)	--	1.55 (0.14)

Adjusted for sample design

[1]"Wanted" includes births classified as both wanted at the time and wanted later

[2]Based on a wealth index ranging from -4.32-3.58. See footnote 2 for explanation.

*p<0.10; **p<0.05; ***p<0.001