**Individual, Family, and Provider Encounter Level Determinants of Short-term Post-abortion Contraceptive Uptake, Method Selection and Discontinuation in Bangladesh**

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**Abstract**

WHO recommends provision of post-abortion contraception as an effective way of reducing subsequent unwanted pregnancy and repeat abortion. Currently, 80% of women receive short-term post-abortion contraceptive methods in Bangladesh, which are less effective and more likely to be discontinued compared to long-term methods. Studies have shown that counseling and contraceptive provision are not enough to prevent repeat abortion; the method selected and context in which a woman uses contraception is important. This study is guided by the social-ecological model, focusing on three levels: individual, family, and provider encounter factors. This prospective study enrolled a facility-based sample of 498 women who accepted short-term post-abortion contraceptive methods or no methods. Women completed a baseline survey on the day of their procedures and a follow-up survey four months later. Logistic and multinomial logistic regression models will be used to identify the determinants of three outcomes: short-term post-abortion contraceptive uptake, method selection, and discontinuation.

## Background

Unwanted pregnancy is a significant contributor to maternal death and disability globally. It is estimated that if unplanned and unwanted pregnancy were prevented using contraception, 25-40% of maternal deaths could be averted (Campbell and Graham, 2006). Additionally, use of effective contraceptive methods could avert 90% of abortion-related morbidity and mortality among women who want to space or limit their births (Collumbien et al., 2004). Provision of post-abortion contraception is an effective way of reducing subsequent unwanted pregnancy and repeat abortion (World Health Organization, 2012). International guidelines state that contraception should be offered to all women who receive abortion services at the time of their procedures (World Health Organization, 2012).

Though menstrual regulation (MR) and post-abortion care (PAC) services are available through the public health system in Bangladesh, provision of post-abortion contraception has been poor in these facilities. A recent study by the Guttmacher Institute found that among government facilities that provide MR services, post-abortion contraception is only provided to half of MR patients (Vlassoff et al., 2012). Post-abortion contraceptive provision is even less common for PAC patients; 66% of facilities that offer PAC services do not offer contraceptive methods (Vlassoff et al., 2012).

While post-abortion contraceptive uptake is important, the type of method selected also has implications for preventing future unwanted pregnancies and repeat abortions. In the general population in Bangladesh, over one third (35.7%) of women discontinue use of their method within one year of initiating use, and discontinuation is most common among short-term method acceptors (NIPORT et al., 2012). Almost half (47%) of condom users, 39% of pill users, and 36% of injectable users discontinue within one year of initiation of their methods (NIPORT et al., 2012). Currently, short-term methods make up over 80% of the post-abortion contraceptive method mix in Bangladesh; oral contraceptive pills account for 47%, while injectables account for 20% and condoms account for 15% (Ipas, 2013). A study in New Zealand found that compared to abortion clients who accepted pills, women selecting intrauterine devices (IUDs) were significantly less likely to have a subsequent abortion over a three-year follow-up period (OR=0.3; 95% CI: 0.2-0.5) (Roberts et al. 2010). Findings from studies such as this have led to the development of interventions that aim to improve post-abortion uptake of long-acting and permanent methods (LAPM). An intervention in the United Kingdom sought to improve LAPM uptake and reduce repeat abortion through an intervention that provided contraceptive counseling from a specialist and enhanced provision of contraceptives, including offering the implant and additional cycles of pills to the intervention group (Schunmann and Glasier, 2006). The study found that while the intervention increased uptake of IUDs and implants immediately post-abortion, it had no effect on repeat abortion (Schunmann and Glasier, 2006). This finding suggests that focusing on counseling and provision of contraceptive commodities alone is not enough to ensure prevention of subsequent unwanted pregnancy, repeat abortion and ultimately maternal morbidity and mortality. The context in which a woman uses contraception is important, and as a result, this study will consider the determinants of post-abortion contraceptive uptake, method selection and discontinuation.

This study is guided by the social-ecological model. Recognizing the importance of supply-side factors such as method availability and contraceptive counseling in determining post-abortion contraceptive uptake and discontinuation in resource-limited settings such as Bangladesh, we use a modified version of the model that focuses on three levels: individual, family, and provider encounter factors.

At the individual level, many studies have shown that contraceptive uptake and discontinuation are associated with socio-demographic characteristics such as age, education, religion and parity (Zavier and Padmadas, 2012; Kamal and Islam, 2010; Kabir et al., 2013; Goni and Rahman, 2012; Kamal, 2011; Schuler et al., 1997; Koenig et al., 1997; Mannan, 2002). Individual attitudes toward contraception and desire to limit births are also key predictors of contraceptive behavior (Akhter, 1987). Other individual level characteristics such as media exposure (Goni and Rahman, 2012; Kamal, 2011), women's empowerment (Schuler et al., 1997), history of contraceptive use (Koenig et al., 1997; Schuler et al., 1997), past experiences with side effects of contraception (DeGraff, 1991; Mannan, 2002), previous abortion (Edmeades et al., 2010) and the abortion procedure type (Kalyanwala et al., 2012) have also

been identified as possible determinants of post-abortion contraceptive uptake, method selection and discontinuation.

At the family level, possible determinants include age gap between husband and wife (Kamal, 2011), household wealth (Kamal, 2011), husband's education (Edmeades et al., 2010), communication about contraception between husband and wife (Kamal and Islam, 2010; Kamal, 2011), perceptions about husband and family members' approval of contraception (Kamal, 2000; DeGraff, 1991; Khan, 2003; Ullah and Humble, 2006) and experience of intimate partner violence (IPV) (Edmeades et al., 2010).

Possible provider encounter determinants include being visited by a family planning field worker (Kamal and Islam, 2010; Hossain and Phillips, 1996; Khan, 2003), providers' attitudes about the family planning method provided (Khan, 2003), knowing sources of multiple contraceptive methods (DeGraff, 1991), and spending more time with providers (Koenig et al., 1997).

Determinants have been identified at each level of the social-ecological model, but elements from all levels have not been integrated into a single model of determinants. As a result, we cannot make hypotheses about which determinants are most important. The present study is carried out in the context of a project to build the capacity of public health facilities to provide safe abortion services in Bangladesh led by Ipas, an international non-governmental organization working to prevent unsafe abortion globally. The objectives of this study are to explore the determinants of post-abortion contraceptive uptake, short-term method selection, and discontinuation.

## Methodology

This is a prospective study that enrolled 498 post-abortion clients ages 18-49. Women completed an interviewer-administered baseline survey on the day of their uterine evacuation (UE) procedures, and they completed a follow-up survey four months after their procedures. Baseline data collection occurred at the health facility, and the four-month follow-up took place either in-person or by telephone, depending on the woman's availability. Interviews were conducted in Bangla and lasted 30-45 minutes. Both the baseline and follow-up women's questionnaires were developed in English and translated to Bangla. The questionnaires were back-translated, and adjustments were made as necessary. Baseline data collection took place from March-June 2013, and endline data collection began in July 2013 and is expected to end in October 2013. The response rate was 89%, and the expected follow-up rate is 70%.

### *Sample*

This study uses a facility-based sample drawn from among the pool of government and NGO facilities where Ipas has trained a provider in UE service provision and upgraded the site to ensure that appropriate equipment and infection prevention materials are available. The Ipas Bangladesh country office maintains a full list of facilities where Ipas works, and this served as the sampling frame for the study. The sampling frame consisted of 47 facilities (18 primary, 16 secondary, 5 tertiary, and 8 NGO facilities), and 16 were randomly selected for inclusion in this study. There are 5,301 public sector facilities in Bangladesh where UE services are provided (Vlassoff et al., 2012). Compared to the broader group of facilities where UE services are provided, facilities where Ipas works are more likely to be in urban settings such as Dhaka and Chittagong. Selecting facilities for this study from the pool of facilities where Ipas works ensures that the women included in the study are receiving a similar quality of care in UE service and post-abortion contraceptive provision.

A stratified one-stage cluster sampling approach was used to select women for the study. Inclusion criteria for facilities included provision of MR or PAC services and provision of pills, injectables, or condoms as post-abortion contraceptive methods. Facilities were stratified by type: primary, secondary, tertiary, and NGO facilities (RHSTEP clinics). A stratified approach was used to ensure representation from all facility types, as these facilities are thought to serve different populations of women. Facilities were randomly selected using probability proportional to size (PPS) sampling within facility type strata. Between facility type strata there was an equal allocation of selected facilities.

Within selected facilities, all women receiving MR or PAC services were screened for study eligibility. Inclusion criteria for study participation included:

- 18-49 years of age;
- Received MR or PAC services using any procedure; and
- Accepted pills, injectables, or condoms as a post-abortion contraceptive method, or selected no method

Women who selected a long-term post-abortion contraceptive method were ineligible for participation. All women in the study facilities who met the inclusion criteria were eligible for participation.

*Analyses*

Three outcomes will be assessed in this study: uptake of short-term post-abortion contraceptive methods, short-term method selected among acceptors, and post-abortion contraceptive discontinuation at the time of the four-month follow-up interview. For each of these outcomes, the individual, family, and provider encounter level determinants will be assessed. All analyses will use clustered standard errors to account for non-independence of respondents within facilities. Significance will be assessed at an alpha of 0.05 for all analyses.

Short-term post-abortion contraceptive uptake

Logistic regression models will be used to determine the association between method uptake and potential determinants for each level (individual, family and provider encounter). Three regression models will be used where Y is uptake of a short-term modern contraceptive method, represented as:

Individual level:

$Pr[Y=1] = \beta_0 + \beta_1$age $+ \beta_2$education $+ \beta_3$religion $+ \beta_4$parity $+ \beta_5$residence $+ \beta_6$media exposure $+ \beta_7$abortion service received $+ \beta_8$procedure type $+ \beta_9$prior pregnancy avoidance $+ \beta_{10}$future pregnancy intentions $+ \beta_{11}$ever used FP $+ \beta_{12}$method used at time of terminated pregnancy $+ \beta_{13}$method failure or inconsistent use $+ \beta_{14}$attitudes about FP $+ \beta_{15}$amount of time expecting to use FP $+ \varepsilon$

where $\varepsilon \sim$ logistic(0,1)

Family level:

$Pr[Y=1] = \beta_0 + \beta_1$husband's age $+ \beta_2$husband's education $+ \beta_3$household type $+ \beta_4$financial situation $+ \beta_5$decision-making about her health care $+ \beta_6$decision-making about her FP use $+ \beta_7$decision-making about her abortion service $+ \beta_8$husband wanted terminated pregnancy $+ \beta_9$in-laws wanted terminated pregnancy $+ \beta_{10}$husband's future pregnancy intentions $+ \beta_{11}$husband opposed to FP $+ \beta_{12}$in-laws opposed to FP $+ \beta_{13}$in-laws physical violence $+ \beta_{14}$husband physical violence $+ \beta_{15}$ husband sexual violence $+ \varepsilon$

where $\varepsilon \sim$ logistic(0,1)

Provider encounter level:

$Pr[Y=1] = \beta_0 + \beta_1$received counseling $+ \beta_2$number of methods told about $+ \beta_3$time counseled $+ \varepsilon$

where $\varepsilon \sim$ logistic(0,1)

A single multivariable logistic regression model of the determinants of short-term post-abortion contraceptive uptake will be built to include the variables that were significant at $p<0.05$ in each of the level-specific regressions. This model is represented as:

$Pr[Y=1] = \beta_0 + \beta_1 A + \beta_2 B + \beta_3 C + \varepsilon$

where $\varepsilon \sim$ logistic(0,1)

Y is uptake of a short-term modern contraceptive method
A is the vector of individual characteristics
B is the vector of family characteristics
C is the vector of provider encounter characteristics

Adjusted odds ratios and 95% confidence intervals will be presented for the full model. Variables that are significant at $p<0.05$ will be considered determinants of post-abortion contraceptive uptake.

Short-term post-abortion method selection

Unordered multinomial logistic regression models will be used to determine the association between method uptake and potential determinants for each level (individual, family and provider encounter). Pill selectors will be used as the reference category since they are expected to be the most prevalent. Three regression models will be used where Y is short-term method selected and K is the number of possible outcomes for which independent logistic regression models will be run. In this model there are three possible outcomes: selecting pills, condoms, or injectables. The models are represented as:

Individual level:

$Pr[Y=K-1] = \beta_0 + \beta_1 age + \beta_2 education + \beta_3 religion + \beta_4 parity + \beta_5 residence + \beta_6 media\ exposure + \beta_7 abortion\ service\ received + \beta_8 procedure\ type + \beta_9 prior\ pregnancy\ avoidance + \beta_{10} future\ pregnancy\ intentions + \beta_{11} ever\ used\ FP + \beta_{12} method\ used\ at\ time\ of\ terminated\ pregnancy + \beta_{13} method\ failure\ or\ inconsistent\ use + \beta_{14} attitudes\ about\ FP + \beta_{15} amount\ of\ time\ expecting\ to\ use\ FP + \varepsilon$

where $\varepsilon \sim logistic(0,1)$

Family level:

$Pr[Y=K-1] = \beta_0 + \beta_1 husband's\ age + \beta_2 husband's\ education + \beta_3 household\ type + \beta_4 financial\ situation + \beta_5 decision\text{-}making\ about\ her\ health\ care + \beta_6 decision\text{-}making\ about\ her\ FP\ use + \beta_7 decision\text{-}making\ about\ her\ abortion\ service + \beta_8 husband\ wanted\ terminated\ pregnancy + \beta_9 in\text{-}laws\ wanted\ terminated\ pregnancy + \beta_{10} husband's\ future\ pregnancy\ intentions + \beta_{11} husband\ opposed\ to\ FP + \beta_{12} in\text{-}laws\ opposed\ to\ FP + \beta_{13} in\text{-}laws\ physical\ violence + \beta_{14} husband\ physical\ violence + \beta_{15} husband\ sexual\ violence + \varepsilon$

where $\varepsilon \sim logistic(0,1)$

Provider encounter level:

$Pr[Y=K-1] = \beta_0 + \beta_1 received\ counseling + \beta_2 number\ of\ methods\ told\ about + \beta_3 time\ counseled + \varepsilon$

where $\varepsilon \sim logistic(0,1)$

A single unordered multinomial logistic regression model of the determinants of short-term post-abortion contraceptive selection will be built that includes the variables that were significant at $p<0.05$ in each of the level-specific regressions. Again, pill selectors will be used as the reference category since they are expected to be the most prevalent. This model is represented as:

$Pr[Y=K-1] = \beta_0 + \beta_1 A + \beta_2 B + \beta_3 C + \varepsilon$

where $\varepsilon \sim logistic(0,1)$

Y is the short-term method selected

K is the number of possible outcomes for which independent logistic regression models will be run. In this model there are three possible outcomes: selecting pills, condoms, or injectables.

A is the vector of individual characteristics

B is the vector of family characteristics

C is the vector of provider encounter characteristics

Adjusted relative risk ratios and 95% confidence intervals will be presented for the full model. Variables that are significant at $p<0.05$ will be considered determinants of short-term method selection.

Short-term post-abortion contraceptive discontinuation

Logistic regression models will be used to determine the association between discontinuation of modern contraception and potential determinants for each level (individual, family and provider encounter). Three regression models will be used where Y is discontinuation of modern contraceptive use at follow-up, represented as:

Individual level:

$Pr[Y=1] = \beta_0 + \beta_1$method selected + $\beta_2$age + $\beta_3$education + $\beta_4$religion + $\beta_5$parity + $\beta_6$residence + $\beta_7$media exposure + $\beta_8$abortion service received + $\beta_9$procedure type + $\beta_{10}$prior pregnancy avoidance + $\beta_{11}$future pregnancy intentions + $\beta_{12}$ever used FP + $\beta_{13}$method used at time of terminated pregnancy + $\beta_{14}$method failure or inconsistent use + $\beta_{15}$attitudes about FP + $\beta_{16}$amount of time expecting to use FP + $\varepsilon$

where $\varepsilon \sim$ logistic(0,1)

Family level:

$Pr[Y=1] = \beta_0 + \beta_1$method selected + $\beta_2$husband's age + $\beta_3$husband's education + $\beta_4$household type + $\beta_5$financial situation + $\beta_6$decision-making about her health care + $\beta_7$decision-making about her FP use + $\beta_8$decision-making about her abortion service + $\beta_9$husband wanted terminated pregnancy + $\beta_{10}$in-laws wanted terminated pregnancy + $\beta_{11}$husband's future pregnancy intentions + $\beta_{12}$husband opposed to FP + $\beta_{13}$in-laws opposed to FP + $\beta_{14}$in-laws physical violence + $\beta_{15}$husband physical violence + $\beta_{16}$husband sexual violence + $\varepsilon$

where $\varepsilon \sim$ logistic(0,1)

Provider encounter level:

$Pr[Y=1] = \beta_0 + \beta_1$method selected + $\beta_2$received counseling + $\beta_3$number of methods told about + $\beta_4$time counseled + $\varepsilon$

where $\varepsilon \sim$ logistic(0,1)

A single logistic regression model for the determinants of short-term post-abortion contraceptive discontinuation will then be built that includes the variables that were significant at $p<0.05$ in each of the level-specific regressions. This model is represented as:

$Pr[Y=1] = \beta_0 + \beta_1$method selected + $\beta_2 A + \beta_3 B + \beta_4 C + \varepsilon$

where $\varepsilon \sim$ logistic(0,1)

Y is discontinuation of modern contraceptive use at follow-up
A is the vector of individual characteristics
B is the vector of family characteristics
C is the vector of provider encounter characteristics

Adjusted odds ratios and 95% confidence intervals will be presented for the full model. Variables that are significant at $p<0.05$ will be considered determinants of post-abortion contraceptive discontinuation.

**Results**

Data collection will be completed in October 2013, and study results will be available in early 2014.

As mentioned above, possible determinants have been identified at each level of the social-ecological model, but elements from all levels have not been integrated into a single model of determinants. The findings of this study are expected to identify the most important determinants at the individual, family, and provider encounter levels for each of the outcomes of interest.

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