Asia Research Institute
Working Paper Series No. 229

Socio-economic Differentials in Contraceptive Discontinuation in India

Kiran Agrahari
International Institute for Population Sciences, India
kiranagrahari@gmail.com

Sanjay K. Mohanty
International Institute for Population Sciences, India
sanjayiips@yahoo.co.in

Rajesh K. Chauhan
Population Research Centre,
Department of Economics, University of Lucknow, India
rajesh_kumar_chauhan@hotmail.com

November 2014

The **ARI Working Paper Series** is published electronically by the Asia Research Institute of the National University of Singapore.

Citations of this electronic publication should be made in the following manner: Author, "Title," ARI Working Paper, No. #, Date, www.nus.ari.edu.sg/pub/wps.htm. For instance, Smith, John, "Ethnic Relations in Singapore," ARI Working Paper, No. 1, June 2003, www.ari.nus.edu.sg/pub/wps.htm.

Asia Research Institute
National University of Singapore
469A Tower Block #10-01,
Bukit Timah Road,
Singapore 259770
Tel: (65) 6516 3810
Fax: (65) 6779 1428
Website: www.ari.nus.edu.sg
Email: arisec@nus.edu.sg

The Asia Research Institute (ARI) was established as a university-level institute in July 2001 as one of the strategic initiatives of the National University of Singapore (NUS). The mission of the Institute is to provide a world-class focus and resource for research on the Asian region, located at one of its communications hubs. ARI engages the social sciences broadly defined, and especially interdisciplinary frontiers between and beyond disciplines. Through frequent provision of short-term research appointments it seeks to be a place of encounters between the region and the world. Within NUS it works particularly with the Faculty of Arts and Social Sciences, Business, Law and Design, to support conferences, lectures, and graduate study at the highest level.

Socio-economic Differentials in Contraceptive Discontinuation in India

INTRODUCTION

In the last two decades, fertility reduction in developing countries is largely due to increased use of modern methods of contraception and less due to other proximate determinants. The diffusion of contraception has taken places across socio-economic groups and space. Though the use of any contraceptive methods in many developing countries has increased from 44% in 1980 to 61% in 2009, the method mix of contraception remained skewed (Sullivan et al 2006; Seiber, Bertrand and Sullivan 2007; United Nations 2011). With the increasing trend in contraceptive adoption, the choice of methods, client satisfaction, side effect of methods, method failure and switching from more effective to lesser effective ones become important for any population (Steele and Diamond 1999; Bradley, Schwandt and Khan 2009). Also, the unmet need for contraception was estimated at 11% in 2009 (United Nations 2011) with large variation across countries, ranging from 5% in Vietnam to 40% in Haiti (Khan et al. 2007).

The sustained use of spacing method protects women from unintended pregnancies, induced abortion, unwanted births and promotes birth spacing. Besides, contraceptive continuation is considered to be a summary outcome indicator of the quality of services (Bruce 1990; Pariani, Heer and Van 1991; Jain, Bruce and Mensch 1992; Bertrand 1994; Koenig, Hossain and Whittaker 1997; Magnani et al. 1999; Blanc, Curtis and Croft 1999; Steele, Curtis and Choe 1999; Ramarao et al. 2003). To large extents, the unintended pregnancies are attributable to contraceptive discontinuation due to method failure and abandonment of contraception while being in the need (Cleland and Ali 2004). In countries passing through demographic transition a further decline in fertility depends upon the consistent, correct and effective use of contraception (Blanc et al. 2002; Vaughan et al. 2008). Jain (1989) and Blanc et al. (2002) propounded to shift the focus of family planning programme from providing contraception to new clients toward quality services to promote the continuation.

The reasons associated with contraceptive discontinuation can be broadly categorized into three groups: method-related reasons, contraceptive failure, and non-method related reasons. Among method related reasons, health concerns and side effects were frequently cited by pill and IUD users while accidental pregnancy was frequently cited among traditional method users (Ali and Cleland 1995; Mitra and Al-Sabir 1996; Singh, Roy and Singh 2010). However, the differentials in failure rates were large across the countries reflecting differences in service delivery, user characteristics and also the differences in defining the failure rates (Ali and Cleland 1995; Sambisa and Curtis 1997; Jejeebhoy 1991). In United States, the failure rates for implants and IUDs were lowest and it was highest for the traditional methods and spermicides (Trussell 2011). The non-method related reasons like desired to get pregnant, infrequent sex, husband away, difficult to pregnant, marital dissolution referring to reduced need also affects the contraceptive discontinuation (Bradley et al. 2009).

Respondents who felt that they did not receive adequate counseling and partner disapproved the use of method were more likely to discontinue a method (Cotton et al. 1992). Age at the time of discontinuation, family size, fertility preferences and the prior use of a method, contraceptive method chosen, prior experience with the method were significant predictors of discontinuation (Ali and Cleland 1999; Moreno 1993; Fathonah, 1996; Mitra and Al-Sabir, 1996; Perez and Tabije, 1996; Sambisa, 1996; Steele et al., 1996; Hamill, Tsui, and Thapa 1990; Curtis and Blanc 1997; Zhang, Tsui and Suchindran 1999; Arifin 2003; Bradley et al. 2009). On the other hand factors like place of residence and educational attainment had little or inconsistent impact on method failure across and

within countries (Curtis and Blanc 1997). The contraceptive discontinuation varies greatly by the level of overall contraceptive use and by type of methods. Cross country evidences suggests that the contraceptive discontinuation was lowest among IUD and implant users followed by injectables, condoms and oral contraceptive users (Ali and Cleland 1995; Blanc et al. 2002; Steele and Curtis 2003; Bradley et al. 2009). Steele and Curtis (2003) concluded that the method choice is endogenous to discontinuation and ignoring endogeneity of method choice can lead to biased estimation of abandonment and switching.

Despite six decades of official family planning program, the use of modern spacing methods of contraception remained low in India. By 2005-06, only 10% women were using any modern spacing method with large variation across socio-economic groups and space. Not only the adoption of spacing method is low, the continuity of these method also remains a concern; 49% pill users, 45% condom uses and 20% IUD users discontinued the method within a year of adoption (IIPS and Macro International 2007). Moreover, the median age of female sterilization has declined from 26.6 years in 1992-93 to 25.5 years by 2005-06 and about 5% sterilized women regretted their decision of getting sterilized. Though the NRHM, the largest flagship health program initiated in 2005, has been successful in increasing the facility based delivery, reduced cost of delivery care and reduced maternal, neo-natal and infant mortality in India (Lim et al. 2010; Mohanty and Srivastava 2012), there has been little increase in the use of spacing method in India. Moreover, the trend in use of traditional method in India is in contrast to the global trend that has implications for protecting unwanted pregnancies and abortions.

Studies in India has extensively focused on trends, differentials and determinants of contraceptive use (Guilmoto and Rajan 2001; Bhat and Xavier 2005; Ram, Dwivedi and Goswami 2007; Blanc et al. 2009; Mohanty and Ram 2011) and less on the post adoption contraceptive behaviour (Zhang et al. 1999). On the other hand, the increasing use of traditional methods, high unmet need for spacing method, high unwanted child-bearing and low birth spacing necessitates an investigation of the correlates on discontinuation of spacing method in India. Accordingly, the aim of this paper is twofold; i) to examine the socio-economic and demographic differentials in discontinuation of spacing methods and ii) to understand the factors associated with the reasons of discontinuation of spacing method in India.

DATA AND METHODS

Research on contraceptive discontinuation in India is limited due to paucity of data on contraceptive history. The National Family and Health Survey, 2005-06 (NFHS-3) for the first time collected contraceptive history along with information on fertility, nutrition, morbidity etc. from a representative sample of over 124,385 women throughout the country. The calendar data in NFHS-3, collected month by month history on four events; i) births, pregnancies and contraceptive use and non-use ii) reason for contraception discontinuation iii) marriage and iv) ultra-sonography during pregnancy. These information were collected from sampled women aged 15-49 years in the five years preceding the survey. A detailed description of the sample design, preliminary finding and the schedule is available in national report (IIPS and Macro International 2007). We have used the calendar data along with women and household files from the NFHS-3 to analyze the reasons of contraceptive discontinuation by methods among socio-economic groups in India.

The calendar data are decoded and episodes of contraceptive use are prepared. An episode is defined as an uninterrupted period of specific contraceptive method use. A switch to another method initiates a new episode of contraceptive use. A woman may use more than one method of contraception and also may restart using the same method therefore she may also contribute more

than one episode in the study sample. For example, in an observation period of five years, a women uses pill for 10 months and discontinues it for 20 months and again reuses IUD for 15 months, she is said to have contributed two episodes. To analyze the calendar data, for each episode five type of variables were created: the current method of contraception, the corresponding reason for discontinuation, the next month's status after discontinuation, the duration of use and the beginning date of current method of contraception in century month code (CMC). The episodes started in the 3-62 months prior to the survey have been included in the analysis. Episodes started three months immediately before the survey were excluded to avoid the first-trimester underreporting of contraceptive failure (Moreno 1993; Curtis and Hammerslough, 1995). The episodes of pill, IUD, condom and traditional method (periodic abstinence and withdrawal) were analyzed while episodes of use of injections, diaphragm, norplants/implants, female condom and other traditional methods were not analyzed because of too few cases. However, the number of episodes for pill, IUD, condom and traditional methods were sufficiently large to draw the socio-economic differences by reasons of discontinuation. The survey recorded 20 reasons of discontinuation. However, for analytical reason we have grouped them into 4 categories; contraceptive failure (became pregnant while using), side effect/health concern (side effect, health concerns, gained weight and created menstrual problem), reduced need (wanted to become pregnant, husband away/infrequent sex, difficult to get pregnant/menopausal and marital dissolution) and others (access/availability, wanted more effective method, cost, inconvenient to use, did not like method, lack of sexual satisfaction, lack of privacy for use, husband disapproved, fatalistic, other reasons, don't know and missing).

The unit of analysis is episode among all women aged 15-49 years. Descriptive statistics, bi-variate analyses, discontinuation rates using the multiple/single decrement life table and multi-level multinomial competing risk analyses have been carried out. In the calendar data a woman is at the risk of discontinuation at any point in time for various reasons and so this type of data is often described as competing risks data. The life table gross rates are calculated applying single decrement approach and used for comparisons across subgroups or countries while the net rates are calculated with the multiple decrement life table approach and model the observed dependent rates. The multilevel discrete-time competing-risks hazards models (equivalent to multilevel multinomial logistic model; Goldstein 1995; Steele et al. 1996; Steele and Diamond 1999) are used to see the factors associated with each type of reason for discontinuation at a given duration of use. The model is of the following form:

$$\log (h_{rtijk}/h_{4tikj})=\alpha_{rt} + x_{rtijk}\beta_r + u_{rjk} + v_{rk} \text{ , } r = 1,2,3$$

Where h_{rtijk} is the hazard of reason of type *r* at duration *t* for use episode of *i* of woman *j* in cluster *k*. The term h_{4tijk} is hazard of continuing use of the same method. The α_{rt} term (baseline hazard; is some function of the duration of the episode t) have been presented in a quadratic formulation ($\alpha_{rt} = \alpha_{r0} + \alpha_{r1}t + \alpha_{r2}t^2$) with durations grouped into six-month intervals. β_r is the vector of parameters for transition *r*, with x_{tijk} the associated set of covariates. The terms u_{rjk} and v_{rk} present the random effects at the woman and the clusters level respectively. The random effects are assumed to be mutually independent and to follow a normal distribution with zero mean and variances α^2_{rjk} and α^2_{rk}. The dependent variable has been categorized into three categories: the method failure, side effects/health concerns and other together and the reasons related to reduced need. The independent variables used are duration of use, contraceptive method, intention to use, age and parity at the time of discontinuation, place of residence, educational attainment, caste, religion, wealth quintile and region of residence. The wealth quintiles were prepared considering rural and urban economic proxies (Mohanty 2009). The contraceptive intention was computed considering wantedness status of the next birth following episode of use. In the absence of birth the current fertility preferences or ideal and actual family size was taken for computing contraceptive intention

(Curtis and Blanc 1997). We intended to fit the model at three levels with episodes at the lowest, women at the second and primary sampling unit (PSU) at the highest level; however the model failed to converge at the PSU level. Therefore we are presenting the estimates from first order Marginal Quasi-Likelihood models.

RESULTS

We begin the discussion by schematic presentation of eligible women and episodes considered in the analyses. Out of 124,385 women, 62,766 women never used any contraception in last five years, 23,534 women were sterilized prior to the observation period[1] and so excluded from the analyses. A total of 38,085 women used any spacing method or encountered termination or opted for sterilization at the any time in the five year period preceding the survey and contributed 57,087 episodes. The left censoring[2] excluded 31,395 episodes and therefore 25,692 episodes were used in the analyses.

Sample Characteristics: Mean Number of Episodes per Woman

Table 1 presents the percent distribution of episodes and the mean number of episodes according to women's selected socio-economic and demographic characteristics. Overall, 73% episodes were of order one, 19% episodes were of order two and 7% were of order three or more. The mean number of episodes was 1.4 and varies by background characteristics. The distribution of episodes varies marginally by age. Among women aged less than 25 years 25% episodes were of order two and above compared to 29% among women aged 25-34 years. The contribution of two or more episodes increased with the parity and declined slightly among women with three or more children. Women who used contraceptives with the intention of limiting the births were more likely to add two or more episodes compared to spacers. The percentage distribution of two or more episodes increased with educational attainment and economic well being of women. This suggests that higher educated and economically better off women are more likely to switch for another method. The percentage of women with two or more episode was maximum in the North-eastern region and minimum in the northern regions. The mean number of episodes varies from a minimum of 1.2 among zero parity women to a maximum of 1.6 among women in the north-eastern states of India. While the mean number of episodes among traditional method user was 1.24 it was 1.03 among IUD users.

Contraceptive Discontinuation by Methods and Reasons in India

Figures 2 present the method-specific gross life-table cumulative probabilities of discontinuation for pill, IUD, condom and traditional methods. The overall discontinuation for any reason was highest among pill users, followed by condom, traditional methods and IUD users (figure 2) irrespective of duration. The level of discontinuation of each of the four methods increased steadily with the duration of use. The probability of discontinuation of pill was 0.49 for the first 12 months, 0.64 in 24 months and 0.73 by 36 months. The pattern is similar in case of condom; 0.44 for the first 12 months, 0.59 in 24 months and 0.67 by 36 months. In case of IUD, the probability of discontinuation was 0.19

[1] An observation period is the period during which woman is exposed to the risk of contraceptive discontinuation. All women were exposed to an equal length of 60 months i.e. episode started within 62 to 3 months preceding the survey.

[2] Episodes started before the 62nd month prior to the survey were excluded since the exact date of adoption is not known (left censoring); while the episodes which were continued at the time of survey (right censoring) were included and treated as censored.

in the first 12 months, 0.34 in 24 months and 0.56 in 36 months. These findings are consistent from cross national studies reported elsewhere (Ali and Cleland 1995; Curtis and Blanc 1997; Bradley et al. 2009; Singh et al. 2010).

We further present the probability of discontinuation by reasons of discontinuation (Fig 3-6). The probability of discontinuation due to method failure was highest among traditional method users; 0.04 in first 12 months, 0.17 in 24 months and 0.24 within 36 months. On the other hand, the discontinuation of IUD due to method failure is lowest; 0.009 in 12 months, 0.015 in 24 months and 0.017 by 36 month (figure 3). However, the probability of discontinuation due to side effect/health concern was highest for pill and IUD and lowest for traditional method. The probability of discontinuation of pill due to side effect/ health concern was 0.25 in 12 months, 0.33 in 24 months and 0.40 in 36 months (figure 4). Though the level of discontinuation for IUD is lower than pill, the patterns of discontinuation due to specific reasons are similar for both methods. Often women complain the side effect of pill and IUDs and our results also confirm this. As expected, the discontinuation due to side effect/health concern remained low for condom and traditional method users. Discontinuation due to reduced need was maximum among condom users followed by traditional method users, pill and IUD users (figure 5). The probability of discontinuation due to reduced need among condom users was 0.23 in 12 months, 0.36 in 24 months and 0.44 in 36 months. We have combined the reasons like husband did not approve or did not like the method etc. into other reasons as women belonging to this group need counseling for contraceptive continuation. We found that the probability of discontinuation due to other reasons was highest among condom users followed by pill and traditional method users (figure 5). A comparison across the methods reveals that the side effect/health concerns were the main reason for discontinuation of pill and IUD while accidental pregnancies were among traditional method use and other reasons for discontinuation of condoms. Among all these four reasons analyzed, the method failure for traditional methods and the side effects of pill and IUDs need programmatic attentions.

Socio-Economic Differentials in Discontinuation Rate of Contraceptive Methods in India

In this section we present the life table net discontinuation rates within 12 months of initiation for each of the pill, IUD, condom and traditional methods by socio-economic and demographic characteristic of women (table 2-3). Among pill users the level of discontinuation decreased with age; from 59% among women below 25 years to 39% each in age group 25-34 and 35-49. Similarly, the level of discontinuation decreased with parity. With education the discontinuation of pill declines first and rises afterwards with educational attainment. For example, the discontinuation rate was 48% among women with no education, 42% among women with less than 5 years of schooling, 47% among women with 5-9 years of schooling and 53% among women with 10 years or more schooling. This is in contrast to the global trend where the discontinuation of pill uses is more among less educated women. Similarly, the discontinuation of pill by wealth quintile varies in the range of 6%; 51% among the poorest, 50% among the poorer, 48% among the middle, 45% among the richer and 49% among the richest. The discontinuation was higher among women residing in rural areas and women belonging to Hindu religion. On the other hand women who practiced contraception with the intention of limiting are likely to continue longer than those who had intention to space (discontinuation rate of 41% vs. 59%). The discontinuation rates of pills are stark among the regions of India; varying from 38% in north-east to 67% each in central and southern regions. The discontinuation of pills by reasons showed that it was largely due to side effect/ health concern followed by reduced need and others. Though the level of discontinuation varies by reasons, the reasons are similar across socio-economic characteristics of women. The side effect/health concern is the single most reason of discontinuation of pill across socio-economic groups.

Like pill, the discontinuation of IUD decreases with age; from 33% among women below 25 years to 14% in 25-34 years and 4% among women in 35-49 years. With respect to education, we found a sharp increase in discontinuation rate of IUDs; from 19% among illiterate to 33% among those with less than 5 years of education which further declined to 20% among women with 5-9 years of education and 17% among women with 10 or more years of education. In general women with little education are more likely to discontinue IUD than illiterate or better educated women. Similarly, with respect to wealth quintile, the discontinuation of IUD was lower among poorest and richest wealth quintile but higher in middle wealth quintile. The discontinuation of IUD among women intended to space between the births/delay pregnancies was double to that of those intended to limit the births. The discontinuation of IUD was low in Western and Northern region and highest in eastern regions. Like pill, the side effect/health concern is the single most cause of discontinuation and minimal for method failure. The overall rate of discontinuation for IUD is lower than the pill across all socio-economic groups in India.

Among the condom users the first 12 month discontinuation rate declined sharply with the age, parity, educational attainment and wealth quintile. With respect to age, the discontinuation rate was 62% among women below 25 years, 30% in 25-34 years and 25% in 35-49 years. The discontinuation rate was 75% in parity 0, 46% in parity 1, 33% in parity 2 and 35% in parity 3. Though the discontinuation of condom did not show any pattern with respect to education, it declines with respect to economic status of household. The discontinuation of condom among poorest wealth quintile was 58% compared to 36% among richest wealth quintile. The discontinuation rate of condom was substantially high in rural areas, and among scheduled tribe and Hindu women. Compared to limiters, the level of condom discontinuation was almost double among those who were practicing contraception with the intention of spacing or delaying the births. At the regional level the discontinuation rate among condom users varied from 34% in northern states to 60% in north-eastern states. The reasons associated with the discontinuation of condom were mostly reduced need and other reasons; though this pattern differed across subgroups. For example; the discontinuation due to reduced need and other reasons was 48% and 22% respectively in zero parity, compared to 10% and 19% respectively in parity three and above. The method failure as reason of discontinuation for condom is higher than that of pill and IUD. It was 5% among women belonging to poorest wealth quintile and scheduled caste. Though the socio-economic differentials in the discontinuation of pill, IUD and condoms were evident, the reasons of discontinuation were similar across the sub-groups.

Among traditional method users the discontinuation rate declined with the age and parity. The 12 month discontinuation was 46% among women under 25 years, 24% among women in 25-34 years and 15% among women aged 35 years and more. The pattern is similar with respect to parity. No large difference in discontinuation of traditional method was observed by educational attainment, wealth quintile, and place of residence. The regional differentials in discontinuation of traditional method vary from 27% in northern states to 39% in southern states. The method failure as reason for discontinuation is quite large for many socio-economic groups. With respect to age, the method failure of traditional method accounts 11% of discontinuation compared to 2% in age group 35-49. It was also high among less educated, poor and schedule caste women. Reduced need also accounts substantial discontinuation of traditional methods. Almost two-fifth of traditional method users form southern states discontinued within first 12-months of adoption; a large of proportion cited reduced need (22%) followed by other reasons (14%). However the 12-month discontinuation rate driven by method failure was very high in the central (11%) and eastern region (8%).

Factors Associated with the Reason for Discontinuation

Results from the multilevel discrete-time competing risks hazard model are presented in table 4. The contraceptive discontinuation was significantly associated with the duration of use, and with all the categories of age at discontinuation, parity at discontinuation, contraceptive method and contraceptive intention. The discontinuation due to method failure was significantly positively associated with the duration of use; however method failure was not associated linearly with the duration of use. Women aged 25-34 and 35-49 years were significantly less likely to discontinue due to contraceptive failure compared to women aged less than 25 years. Discontinuation due to contraceptive failure was significantly lower among women with 1-2 children, limiters and in the users of pill, IUD and condom compared to their counterparts. The method failure was significantly negatively associated with wealth quintiles. Contraceptive failure was significantly more among Muslims and other religions compared to Hindus. Except western region the contraceptive failure was significantly more in all regions compared with northern region. Among the predictors of contraceptive discontinuation due to side effect and other reasons combined, the duration of use, age at discontinuation, parity at discontinuation and religion were significantly negatively associated however place of residence, contraceptive method, Muslims and women belonging to other religions, and region of residence were significantly positively associated. The discontinuation due to side effect, health concern or other reasons declined with the duration of use; however this was not linearly associated with the duration. Discontinuation due to side effects was less likely among older women, women with children compared to their counterparts. Rural women, users of pill, IUD and condom, other backward castes women and women from central, eastern, north-eastern, western and southern region were more likely to discontinue to their method due to side effects.

Discontinuation due to reduced need increased with the duration of use. Discontinuation due to reduced need was significantly negatively associated with older women, with children, practicing with the intention to limit child bearing, IUD users and in richer wealth quintiles. The factors like rural place of residence, pill and condom users, other backward castes, and central and southern regions were significantly positively associated with the discontinuation due to reduced need. After controlling for all these covariates a large level of heterogeneity remained at the women level. This indicates unobserved factors operating at the level of women, which are unexplained, have role in reasons associated with discontinuation. Steele and diamond (1999) attributed two women level factors, which can influence the discontinuation: women's commitment and motivation to avoid childbearing and experience with the earlier methods and constrain in women's mobility.

DISCUSSION

Though the Indian states are at different stage of development and demographic transition, they are similiar with respect to contraceptive method-mix. The share of female sterilization in overall contraceptive use is high (similar) in demographically advanced and backward states of India. On the other hand, the use of modern spacing method remained low due to varying reasons; overemphasis on female sterilization in official family planning program, restricted method choices (pill, IUD and condom are on official list), poor quality of services, inaccessibility and un-affordability of services and lack of knowledge on birth spacing (Zavier and Padmadas 2000; Koenig, Foo and Joshi 2000; Akoijam et al. 2005). Even among those using a modern spacing method the discontinuation is high. However, the use of traditional spacing method (abstinence and withdrawal) has shown an increasing trend but the efficacy of such methods in preventing births and pregnancies is low (Ali and Cleland 1995; Creanga et al. 2007). On the other hand, the unmet need for modern spacing method remained high and a significant proportion of women articulate their desire to use the modern spacing method in future. Though the RCH programme in India has emphasized in

promotion of modern spacing method, it has not shown any significant improvement over time. An understanding of the reason for discontinuation is essential from program point of view. In this context, this paper examines the pattern and reasons of discontinuation of pill, IUD, condom and traditional method among socio-economic groups in India using the contraceptive history from National Family Health Survey 3.

We have following results. First, about half of the pill user, two-fifth of condom users, one-third of traditional method user and one-fifth of IUD users discontinue the method within 12 months of use. This is possibly due to the endogeneity of method choice as reported by other studies (Steele and Curtis 2003). The duration of an IUD use is 12-60 months and there is less possibility of discontinuing the method by user while in use. On the other-hand the pill are for monthly duration but consumed daily while the use of condom is for every sexual act and more likely to be discontinued. Though we believe that the cost might be a significant barrier for discontinuation of modern spacing methods, our results did not support it. We found that the cost as reason for discontinuation was 0.3% for pill, 0.1% for IUD and 0.8% for condom within 12-months of initiation. Second, the discontinuation rate for all these spacing methods decline with age and parity but vary by methods. For example, among older women (37-49 years), while 39% pill user discontinue the method it was 25% for condom, 15% for traditional method and 4% for IUD users. With respect to education, we found that the discontinuation of IUD and condom is maximum among women with education of less than five years while the discontinuation of pill is maximum among higher educated women. While the discontinuation of condom declines with increasing economic status, it varies in a small range for pill users and does not show any pattern with respect to IUD (maximum among middle wealth quintile and lowest among richest wealth quintile). There are no significant differentials in discontinuation of traditional method by educational level and wealth quintile. Third, regional differentials in discontinuation of all these method are large. In case of pill, about two-third users each in southern and central region discontinued the method and it was minimum in north-eastern states (38%). On the other-hand, the discontinuation of condom is maximum in north-eastern region (60%) and least in northern region (34%). The discontinuation of IUD is maximum in eastern region (27%) and minimum in western region (14%). Fourth, the side effect/ health concern is significant cause of discontinuation of pill and IUD while the method failure is the main cause of discontinuation of traditional method. On the other hand, though the use of traditional method has increased over time, the method failure among traditional method user was large indicating low efficacy of the method in preventing unwanted births and pregnancies. Also the discontinuation due to method failure among traditional method users was higher among less educated and poor compared to higher educated and rich. Fifth, the reduced need, side effect/ health concern and the method failure as reasons of discontinuation of modern spacing method declines by age and parity of women. Last, results of the multivariate analyses suggest that the contraceptive discontinuation was significantly associated with duration of use, age, parity, contraceptive method and contraceptive intention.

We put forward at least three implications based on our results. First, the side effects of pill/IUD need urgent programmatic attention. The side effects of IUD often tend to be serious; ranging from menstrual bleeding, inter-menstrual pelvic pain to dysmenorrhea (Trieman et al 1995; Farr and Amatya 1994); while the common complains with the use of pill are breakthrough bleeding, dizziness, headache, lightheadedness, bloating, or nausea (Vlieg 2009; Cushman 2012). In fact the long term use of oral pill is associated with blood coagulation, increased risk of cardio-vascular problems, chronic immune disorders with an inflammatory component, including cancer (Cushman 2012). These issues need to be addressed and better quality of method should be provided. This is in contrast to China and other Asian countries where IUD accounts about 40% of method users. The programmatic attention to the discontinuation is imminent as large proportions of women articulate to use pill and IUD as preferred method in future. Second, women reporting discontinuation of pill

and IUD citing reduced need (due to husband's opposition, fatalistic, did not like the method, inconvenient to use) require counseling. Once users, these women are more likely to continue the method if they are provided with good quality services. Hence the information education and communication (IEC) need to be strengthened for retaining the modern spacing method. Third, the method failure of traditional method is a concern. There is a need to motivate these users to modern method users that will protect them from unwanted births and abortions. Fourth, most of the condom, IUD and pill users are from private sector for which they need to pay for the method. Thus, provisioning these services adequately in public health centers can increase the use and continuity of these services. Based on these we suggest to improve the quality of methods, to address the issue of side effects of methods, increase supply of adequate methods and motivate the traditional method users to modern spacing method users for improved reproductive health.

ACKNOWLEDGMENTS

The authors would like to thank Dr N.K.Singh for his help in decoding calendar data.

REFERENCES

Akoijam BS, Hanjabam SD, Longjam UD, Thangjam DN. 2005. Knowledge and attitude of males regarding birth spacing and contraception. *Indian Journal of Public Health* 49 (1):30-1.

Ali M, Cleland J. 1999. Determinants of contraceptive discontinuation in six developing countries. *Journal of Biosocial Science* 31(3):343-360.

Ali M, Cleland J.1995. Contraceptive discontinuation in six developing countries: A cause-specific analysis. *International Family Planning Perspectives* 21:92-97.

Arifin EN. 2003. Factors associated with contraceptive discontinuation in Bali, Indonesia: A Multilevel Discrete-time competing risks hazard model. *Asian Metacentre Research Paper Series number 15.*

Bairagi R, Rahman M. 1996. Contraceptive Failure in Matlab, Bangladesh. *International Family Planning Perspectives* 22 (1):21-25.

Barden-O'Fallon J, Speizer I. 2011. What Differentiates Method Stoppers from Switchers? Contraceptive Discontinuation and Switching Among Honduran Women. *International Perspectives on Sexual and Reproductive Health* 37(1):16–23, doi: 10.1363/3701611

Bertrand J, Magnani R, Knowles J. 1994. *Handbook of Indicators for Family Planning Program Evaluation*. Chapel Hill, North Carolina: The EVALUATION Project.

Bhat PNM, Xavier AJF. 2005. Role of religion in fertility decline: the case of Indian Muslims. *Economic and Political Weekly* 40:385-402.

Blanc AK, Curtis SL, Croft TN. 1999. Does contraceptive matter? Quality of care and fertility consequences. *MEASURE Evaluation Technical Report Series No.3*.

Blanc AK, Curtis SL, Croft TN. 2002. Monitoring contraceptive continuation: Links to fertility outcomes and quality of care. *Studies in Family Planning*. 33(2):127-140.

Blanc AK, Tsui AO, Croft TN, Trevitt JL. 2009. Patterns and trends in adolescents' contraceptive use and discontinuation in developing countries and comparisons with adult women. *International Perspectives on Sexual and Reproductive Health* 35(2):63–71

Bradley SEK, Schwandt HM, Khan S. 2009. *Levels, Trends, and Reasons for Contraceptive Discontinuation*. DHS Analytical Studies No. 20. Calverton, Maryland, USA: ICF Macro.

Bruce J. 1990. Fundamental elements of the quality of care: a simple framework. *Studies in Family Planning* 21(2):61-91.

Cleland J, Ali MM. 2004. Reproductive consequences of contraceptive failure in 19 developing countries. *Obstetrics & Gynecology* 104(2):314-320.

Cotton N, Stanback J, Maidouka H, Taylor-Thomas JT, Turk T. 1992. Early discontinuation of contraceptive use in Niger and the Gambia. *International Family Planning Perspectives* 18(4):145-149.

Creanga AA, Acharya R, Ahmed S, Tsui AO. 2007. Contraceptive Discontinuation and Failure and Subsequent Abortion in Romania: 1994–99. *Studies in Family Planning* 38(1): 23–34.

Curtis SL and Hammerslough CR. 1995. Model further analysis plan: Contraceptive use dynamics. Calverton, Maryland: Macro International Inc.

Curtis SL, Blanc AK. 1997. *Determinants of contraceptive failure, switching, and discontinuation: An analysis of DHS contraceptive histories.* DHS Analytical Reports No.6.Calverton, Maryland: Macro International Inc.

Curtis SL. 1996. The impact of postpartum redundant use of contraception on contraceptive failure rates. *Demography* 33(1): 24-34.

Cushman G. 2012. Primary Risks of Oral Contraceptives and HRT. *Natural medicine Journal.* Available@: http://www.naturalmedicinejournal.com/article_content.asp?edition=1&section=2&article=321.

Farr G, Amatya R. 1994. Contraceptive efficacy of the Copper T380A and the Multiload Cu250 IUD in three developing countries. *Advances in Contraception* 10(2):137–49.

Fathonah S. 1996. Contraceptive use dynamics in Indonesia. *DHS Working Papers* No. 20. Calverton, Maryland: Macro International Inc.

Goldman N, Pebley AR, Westoff CF, Paul LE. 1983. Contraceptive failure rates in Latin America. *International Family Planning Perspectives* 9(2):50-57.

Goldstein H. 1995. Multilevel Statistical Models. Second edition. London: Edward Arnold.

Guilmoto CZ, Rajan SI, 2001. Spatial patterns of fertility transitions in Indian districts. *Population and Development Review* 27(4):713-718.

Hamill DN, Tsui AO, Thapa S. 1990. Determinants of contraceptive switching behavior in rural Sri Lanka. *Demography* 27(4):559-578.

Jain A, Bruce J, Mensch B. 1992. Setting standards of quality in family planning programs. *Studies in Family Planning* 23(6):392-395.

Jain, A. 1989. Fertility reduction and the quality of family planning services. *Studies in Family Planning* 20(1):1-16.

Jejeebhoy S. 1991. Measuring contraceptive use failure and continuation: An overview of new approaches. In: *Measuring the Dynamics of Contraceptive Use*. New York: United Nations, 21-51.

Kane TT, Gaminiratne KHW, Stephen EH. 1988. Contraceptive method switching in Sri Lanka: Patters and implications. *International Family Planning Perspectives* 14 (2):68-75.

Khan S, Mishra V, Arnold F, Abderrahim N. 2007. Contraceptive trends in developing countries. DHS Comparative Reports No. 16. Calverton, MD: Macro International Inc.

Koenig MA, Foo GHC, Joshi K. 2000. Quality of Care within the Indian Family Welfare Programme: A Review of Recent Evidence. *Studies in Family Planning* 31 (1): 1-18.

Koenig MA, Hossain MB, Whittaker M. 1997. The influence of quality of care upon contraceptive use in rural Bangladesh. *Studies in Family Planning*. 28 (4):278-289.

Laguna EP, Po ALC, Perez AE. 2000. *Contraceptive Use Dynamics in the Philippines: Determinants of Contraceptive Method Choice and Discontinuation.* Calverton, Maryland: ORC Macro.

Lim S, Dandona L, Hoisington J et al. 2010. India's Janani Suraksha Yojana, a conditional cash transfer programme to increase births in health facilities: an impact evaluation. *The Lancet* 375: 2009–23.

Magnani RJ, Hotchkiss D, Florence CS, Shafer LA. 1999. The Impact of the Family Planning Supply Environment on Contraceptive Intentions and Use in Morocco. *Studies in Family Planning* 30(2):120–132.

Mitra SN, Al-Sabir A. 1996. Contraceptive use dynamics in Bangladesh. *DHS Working Papers* No. 21. Calverton, Maryland: Macro International Inc.

Mohanty SK. 2009. Alternative wealth indices and health estimates in India. *Genus* 65(2):113-137.

Mohanty SK, Ram F. 2011. Spatial pattern of poverty reduction and fertility transition in India. *Population Review* 50(1):62-78.

Mohanty SK, Srivastava A. 2012. Cost and Utilisation of Hospital Based Delivery Carein Empowered Action Group (EAG) States of India. *Maternal and Child Health Journal* 15 (1). DOI 10.1007/s10995-012-1151-3

Moreno L. 1993. Differences by residence and education in contraceptive failure rates in developing countries. *International Family Planning Perspectives* 19(2): 54-60, 71.

Pariani S, Heer DM, Van, AMDJr. 1991. Does choice make a difference to contraceptive use? Evidence from East Java. *Studies in Family Planning* 22(6):384-390.

Perez AE, Tabije TL. 1996. Contraceptive discontinuation, failure and switching behavior in the Philippines. *DHS Working Papers* No. 18. Calverton, Maryland: Macro International Inc.

Ram U, Dwivedi LK, Goswami B. 2007. Understanding contraception use among Muslims of India, Pakistan and Bangladesh. *Journal Of Population And Social Studies.* 15(2):101-130.

RamaRao S, Lacuesta M, Costello M, Pangolibay B, Jones H. 2003. The link between quality of care and contraceptive use. *International Family Planning Perspectives* 29 (2):76-83.

Sambisa W, Curtis S. 1997. Contraceptive use dynamics in Zimbabwe: Postpartum contraceptive behavior. *Zimbabwe Further Analysis*. Calverton, Maryland: Macro International Inc.

Sambisa, W. 1996. *Contraceptive use dynamics in Zimbabwe: Discontinuation, switching, and failure. Zimbabwe Further Analysis*. Calverton, Maryland: Macro International Inc.

Seiber EE, Bertrand JT, Sullivan TM. 2007. Changes in Contraceptive Method Mix in Developing Countries. *International Family Planning Perspectives* 33(3):117-123.

Singh KK, Roy TK, Singh BP. 2010. Contraceptive discontinuation and switching patterns in Bangladesh. *Genus* 66 (1): 63-88.

Steele F, Curtis SL, Choe M. 1999. The impact of family planning service provision on contraceptive use dynamics in Morocco. *Studies in Family Planning* 30 (1):28-42.

Steele F, Curtis SL. 2003. Appropriate Methods for Analyzing the Effect of Method Choice on Contraceptive Discontinuation. *Demography* 40 (1): 1-22.

Steele F, Diamond I, Wang D. 1996. The determinants of the duration of contraceptive use in China: A multilevel multinomial discrete-hazards modeling approach. *Demography* 33(1):12-23.

Steele F, Diamond I. 1999. Contraceptive switching in Bangladesh. *Studies in Family Planning* 30(4):315-328.

Sullivan TM, Bertrand JT, Rice J, Shelton JD. 2006. Skewed contraceptive method mix: Why it happens, why it matters. *Journal of Biosocial Science* 38:501-521.

Trieman K, Liskin L, Kols A, Rinehart W. Johns Hopkins School of Public Health, Population Information Program. Baltimore, MD: 1995. IUDs-an update. Population Reports, Series B, No. 6.

Trussell J. 2011. Contraceptive failure in the United States. *Contraception* 38(5): 397-404.

United Nations. 2011. Department of Economic and Social Affairs, Population Division. *World Contraceptive Use 2010* (POP/DB/CP/Rev2010).

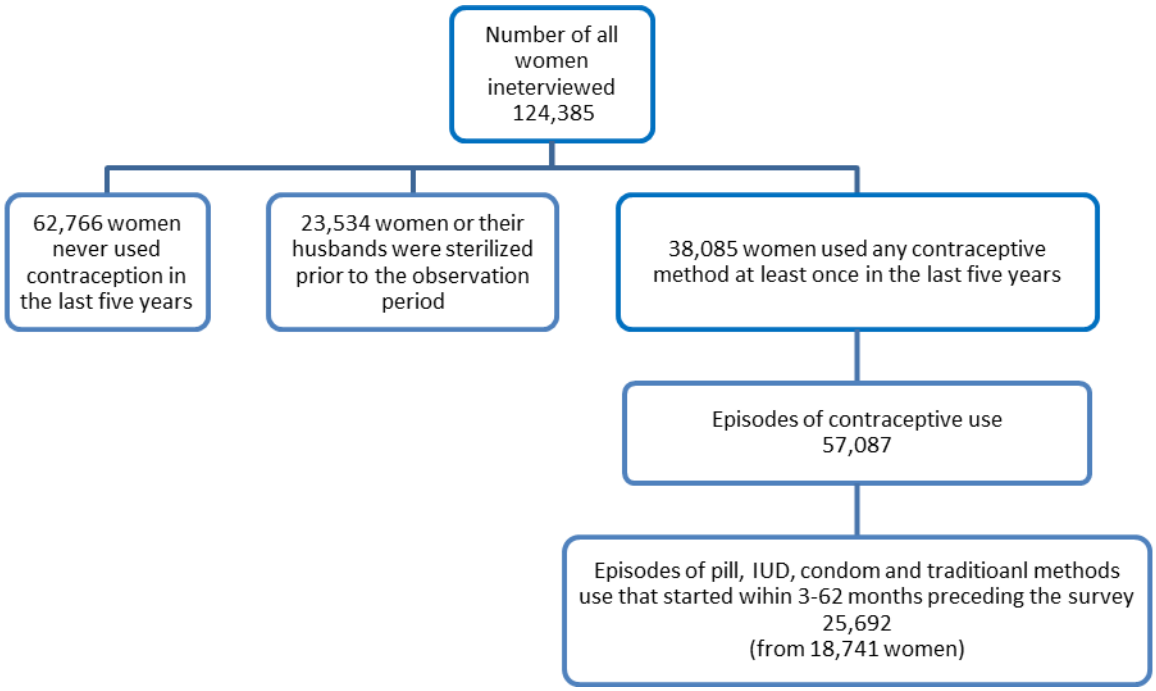
Vaughan B, Trussel J, Kost K, Singh S, Jones R. 2008. Discontinuation and resumption of contraceptive use: results from the 2002 National Survey of Family Growth. *Contraception*, 28:271-283.

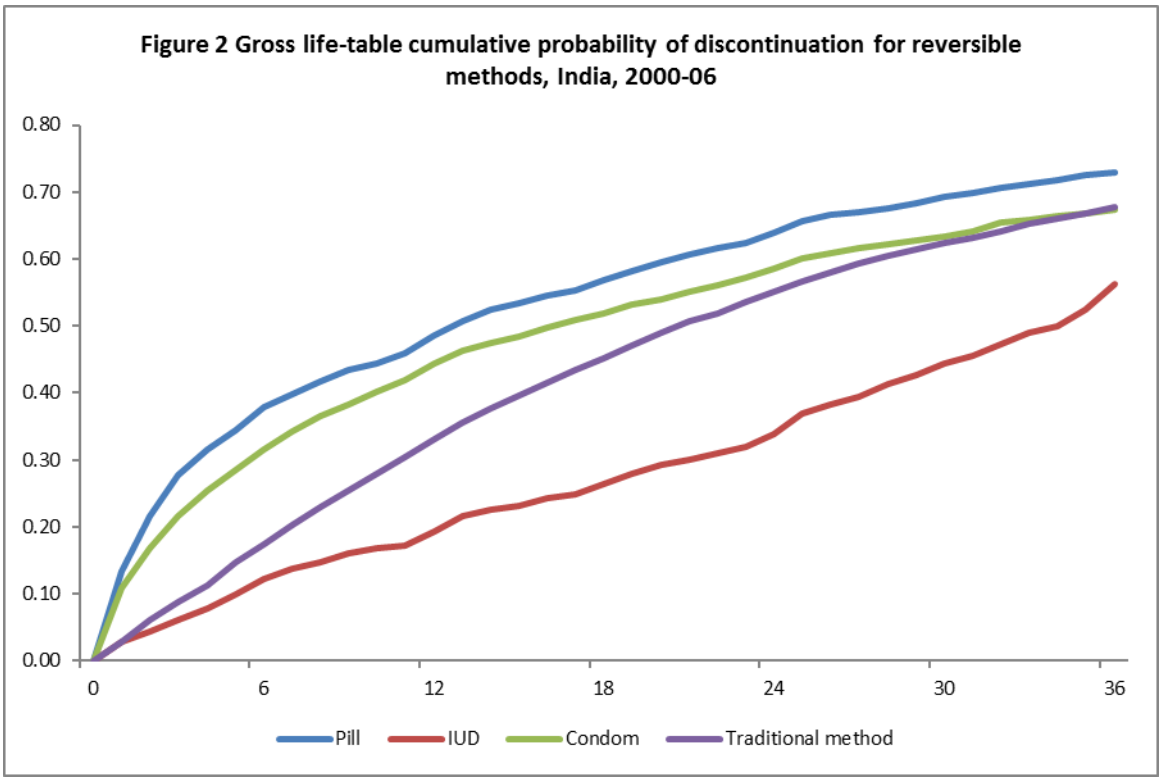
Vlieg AH, Helmerhorst FM, Vandenbroucke JP, Doggen CJM, Rosendaal FR. 2009. The venous thrombotic risk of oral contraceptives, effects of oestrogen dose and progestogen type: results of the MEGA case-control study. *BMJ* 339:b2921. doi:10.1136/bmj.b2921.

Zavier F, Padmadas SS. 2000. Use of a spacing method before sterilization among couples in Kerala, India. *International Family Planning Perspectives* 26(1):29.35.

Zhang F, Tsui AO, Suchindran CM. 1999. The Determinants of Contraceptive Discontinuation in Northern India: A Multilevel Analysis of Calendar Data. MEASURE Evaluation Project, Working Paper: 99-15. Carolina Population Center University of North Carolina at Chapel Hill: Chapel Hill.

Figure 1. Schematic Presentation of the Sample Selected





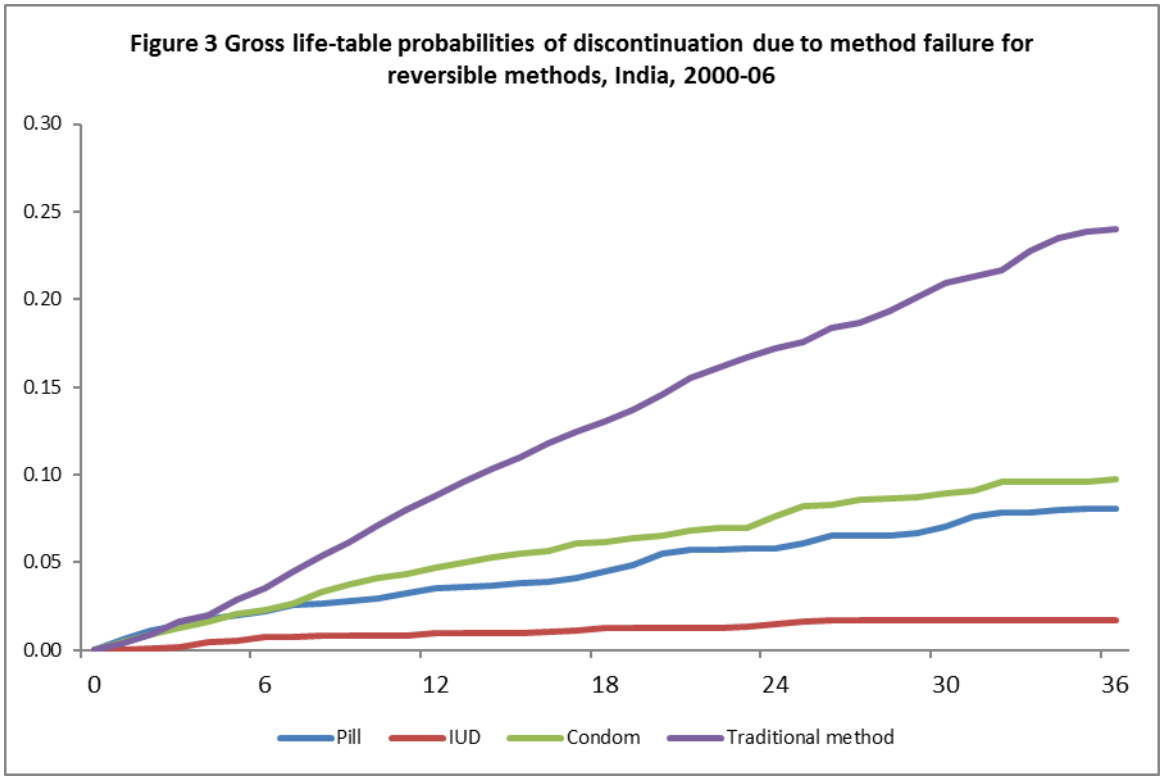


Figure 3 Gross life-table probabilities of discontinuation due to method failure for reversible methods, India, 2000-06
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
6
12
18
24
30
36
Pill
IUD
Condom
Traditional method

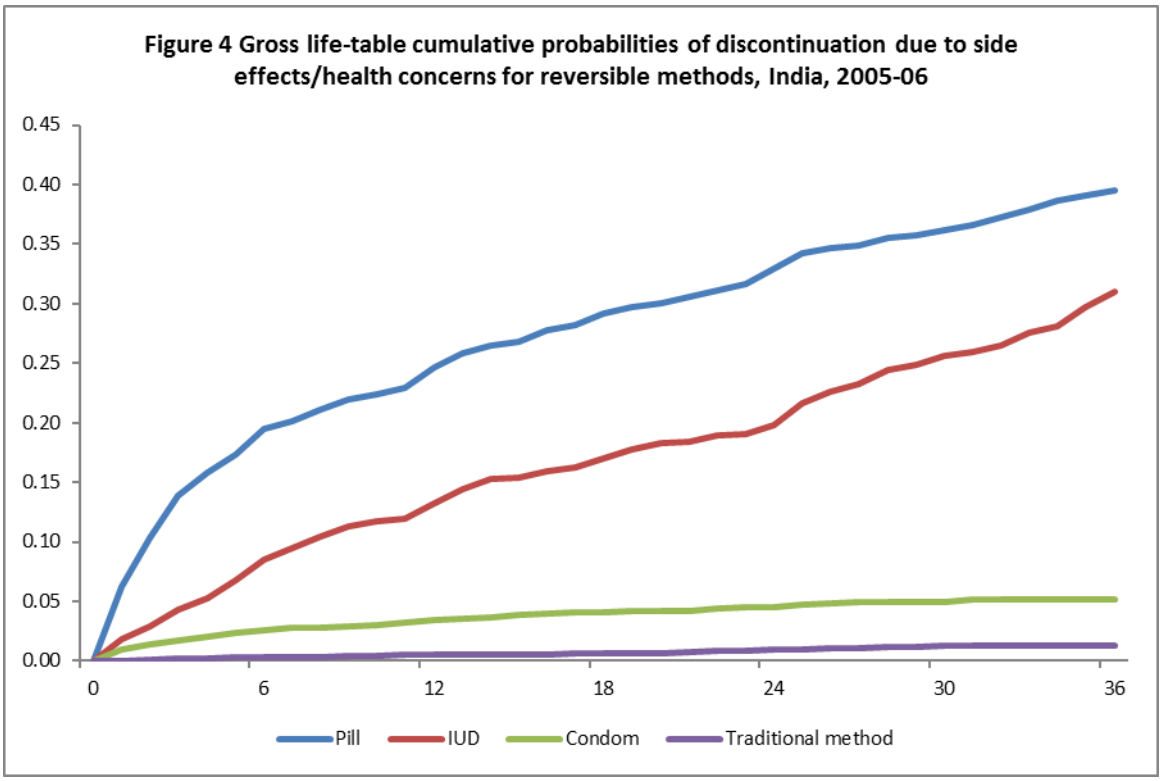


Figure 4 Gross life-table cumulative probabilities of discontinuation due to side effects/health concerns for reversible methods, India, 2005-06
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
6
12
18
24
30
36
Pill
IUD
Condom
Traditional method

Figure 5 Gross life table cumulative probabilities of discontinuation due to reduced need for reversible methods, India, 2005-06

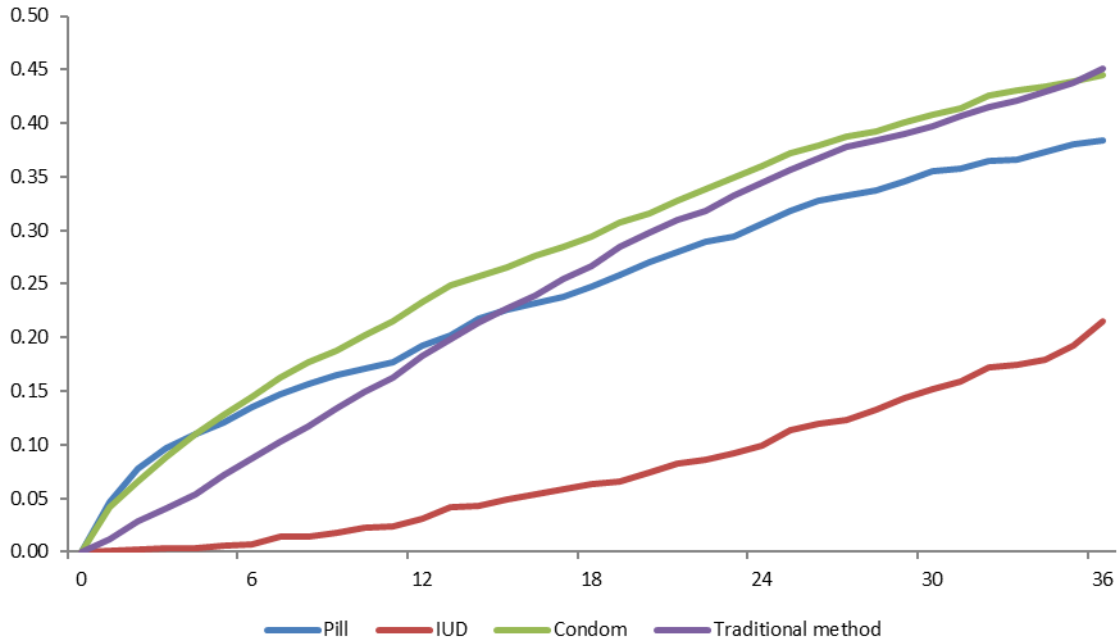


Figure 6 Gross life-table cumulative probabilities of discontinuation due to other reasons, India, 2000-06

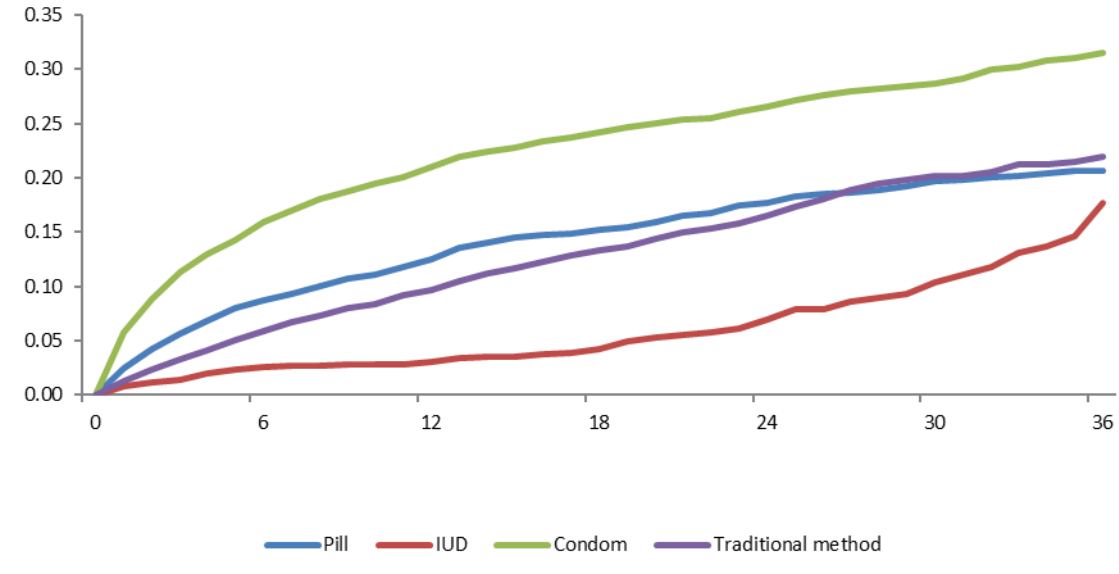


Table 1. Percent Distribution and Mean Number of Episodes of Pill, IUD, Condom and Traditional Methods by Women's Background Characteristics, India

Characteristics	1	2	3+	Total	Mean	N
Age at the End of Episode						
<25 years	74.8	19.4	5.8	100	1.34	10,143
25-34 years	71.4	21.3	7.3	100	1.44	12,403
35-49 years	73.1	16.7	10.2	100	1.55	3,146
Place of Residence						
Urban	72.7	20.4	6.9	100	1.39	12,956
Rural	73.1	19.6	7.3	100	1.43	12,736
Educational Attainment						
No education	76.3	18.8	5.0	100	1.31	5,832
<5years	74.1	19.6	6.4	100	1.35	1,712
5-9 years	72.0	20.6	7.4	100	1.42	8,231
10 or more years	71.6	20.3	8.1	100	1.47	9,917
Caste						
Scheduled caste	73.8	19.7	6.5	100	1.43	3,734
Scheduled tribe	76.4	17.8	5.8	100	1.38	2,594
Other backward caste	73.6	19.3	7.1	100	1.38	6,947
Other	71.6	20.9	7.5	100	1.43	12,417
Religion						
Hindu	72.4	20.0	7.6	100	1.44	18,025
Muslim	72.8	21.0	6.3	100	1.37	4,400
Christian	76.3	18.0	5.6	100	1.32	1,862
Other	76.5	18.6	4.9	100	1.31	1,405
Parity at the End of Episode						
0	85.8	11.6	2.6	100	1.17	2,660
1	74.5	18.6	6.9	100	1.41	8,473
2	66.9	24.2	8.9	100	1.50	7,104
3+	72.4	20.4	7.2	100	1.41	7,455
Contraceptive Intention						
Spacing	76.9	18.0	5.1	100	1.33	12,192
Limiting	69.4	21.8	8.9	100	1.48	13,474
Contraceptive Method						
Pill	87.3	9.4	3.4	100	1.16	6,142
IUD	95.5	4.4	0.1	100	1.04	2,716
Condom	86.9	11.1	2.0	100	1.15	7,872
Traditional methods	80.1	16.2	3.7	100	1.23	8,962
Wealth Quintile						
Poorest	76.2	18.9	4.9	100	1.31	3,296
Poorer	73.4	20.3	6.3	100	1.39	4,438
Middle	70.9	20.1	9.0	100	1.48	5,001
Richer	72.6	19.8	7.6	100	1.44	5,580
Richest	72.9	20.3	6.8	100	1.40	7,377
Region						
North	78.9	16.9	4.1	100	1.27	4,392
Central	72.5	21.1	6.4	100	1.37	5,352
East	71.4	21.0	7.6	100	1.45	4,525
North-east	68.1	21.5	10.5	100	1.57	6,746
West	75.9	18.9	5.2	100	1.32	2,672
South	77.1	17.7	5.3	100	1.33	2,005
Household Structure						
Nuclear	53.8	29.9	16.2	100	1.36	12,016
Non-nuclear	52.2	31.3	16.5	100	1.38	13,676
Total	72.9	20.0	7.1	100	1.41	25,692

Table 2. The 12-Months Net Cumulative Life Table Discontinuation Rates for Oral Pill and IUD by Reason for Discontinuation, According to Women's Background Characteristics, India, 2000-06

Characteristics	Pill					IUD				
	Method failure	Reduced need	Side effect/ health concern	Other	Total	Method failure	Reduced need	Side effect/ health concern	Other	Total
Age at the End of Episode										
<25 years	3.3	18.5	26.4	11.4	59.6	1.4	5.5	21.4	5.1	33.3
25-34 years	2.0	11.7	17.0	8.4	39.1	0.8	1.5	9.7	1.9	13.9
35-49 years	1.2	18.7	12.7	6.1	38.8	0.0	0.0	3.8	0.3	4.1
Place of Residence										
Urban	2.1	12.3	22.4	6.2	43.0	1.1	2.3	10.6	2.6	16.6
Rural	2.8	17.3	20.3	11.3	51.7	0.6	3.1	15.5	3.1	22.3
Educational Attainment										
No education	3.7	13.0	21.2	10.5	48.4	1.3	1.4	13.7	2.5	19.0
<5years	2.2	10.6	21.4	8.2	42.4	0.0	3.2	21.6	7.9	32.7
5-9 years	2.3	16.1	19.7	9.2	47.3	0.8	2.6	14.6	2.8	20.8
10 or more years	1.4	19.5	22.2	9.4	52.5	0.6	3.1	10.5	2.7	17.0
Caste										
Scheduled caste	2.7	13.1	21.5	10.3	47.6	0.4	1.9	15.2	2.1	19.7
Scheduled tribe	4.7	13.9	16.9	13.4	48.9	2.5	2.2	14.6	1.7	21.0
Other backward caste	2.8	17.3	24.9	12.2	57.2	0.7	3.5	14.1	3.4	21.7
Other	2.1	15.6	19.1	7.2	43.9	0.8	2.3	11.0	2.9	17.0
Religion										
Hindu	2.3	15.9	21.9	10.5	50.6	1.0	2.4	13.1	2.1	18.7
Muslim	3.2	14.7	18.7	6.2	42.9	0.0	5.2	12.7	6.1	23.9
Christian	4.7	14.3	11.7	10.7	41.4	0.0	1.5	9.1	0.6	11.2
Other	2.3	14.8	19.3	11.1	47.5	0.4	0.5	9.5	5.5	15.8
Parity at the End of Episode										
0	1.3	36.4	27.9	10.8	76.4	**	**	**	**	**
1	2.5	15.7	25.0	9.2	52.4	1.0	4.4	15.5	4.0	25.0
2	2.4	14.9	17.3	7.2	41.9	0.0	1.6	9.3	1.8	12.7
3+	2.9	11.8	18.8	11.4	44.9	1.5	1.4	12.9	2.9	18.7
Contraceptive Intention										
Spacing	2.9	21.2	25.2	9.8	59.2	1.4	5.9	17.0	3.9	28.3
Limiting	2.2	11.5	17.9	9.4	40.9	0.5	1.0	10.5	2.3	14.3
Wealth Quintile										
Poorest	4.6	15.5	19.4	11.3	50.8	1.5	0.8	16.3	3.7	22.3
Poorer	1.9	15.9	21.2	10.8	49.9	2.0	3.1	16.0	3.1	24.1
Middle	2.2	15.0	21.2	9.6	48.0	0.7	5.2	14.4	5.3	25.6
Richer	1.9	14.8	20.3	8.4	45.3	0.0	2.0	15.1	2.6	19.8
Richest	1.8	16.3	23.2	7.4	48.7	1.0	2.1	9.8	2.3	15.2
Region										
North	3.1	11.1	23.8	4.7	42.7	0.8	0.5	10.8	2.1	14.2
Central	3.1	19.8	29.4	14.5	66.9	1.2	2.1	18.5	3.6	25.4
East	2.9	12.9	18.8	7.8	42.4	2.2	0.7	19.1	4.9	26.8
North-east	1.1	14.9	13.5	8.8	38.3	1.7	3.3	13.3	2.6	20.9
West	1.2	16.6	19.3	8.9	45.9	0.2	1.3	10.8	2.0	14.2
South	0.7	29.2	20.0	16.7	66.7	0.8	6.0	10.2	3.7	20.6
Household Structure										
Nuclear	3.3	13.3	20.3	8.6	45.5	0.8	2.7	12.4	3.6	19.5
Non-nuclear	1.9	17.6	21.6	10.4	51.5	0.8	2.6	13.1	2.4	18.9
Total	2.5	15.6	21.0	9.6	48.6	0.8	2.7	12.8	2.9	19.2

** Not shown due to less than 125 unweighted cases.

Table 3. The 12-Months Net Cumulative Life Table Discontinuation Rates for Condom and Traditional Methods by Reason for Discontinuation, According to Women's Background Characteristics, India, 2000-06

Characteristics	Condom					Traditional Methods				
	Method failure	Reduced need	Side effect/ health concern	Other	Total	Method failure	Reduced need	Side effect/ health concern	Other	Total
Age at the End of Episode										
<25 years	4.5	30.9	3.3	23.6	62.3	11.1	24.1	0.5	10.7	46.4
25-34 years	2.8	10.4	2.5	14.6	30.3	5.3	10.3	0.4	7.9	23.9
35-49 years	0.9	10.3	1.5	12.3	24.9	1.5	9.2	0.2	4.1	15.1
Place of Residence										
Urban	3.1	16.7	2.6	14.8	37.1	5.8	14.2	0.5	9.9	30.3
Rural	3.8	22.4	2.9	22.1	51.1	8.0	17.3	0.5	8.3	34.1
Educational Attainment										
No education	4.6	17.4	2.5	21.9	46.4	8.1	17.2	0.3	5.9	31.4
<5years	4.7	18.2	2.1	30.1	55.2	10.1	14.4	1.0	7.9	33.3
5-9 years	3.7	22.6	2.6	20.2	49.2	7.3	16.6	0.3	9.8	34.1
10 or more years	2.7	18.9	3.0	14.7	39.2	5.4	15.7	0.6	12.6	34.3
Caste										
Scheduled caste	5.1	17.3	4.1	22.3	48.8	9.0	16.8	0.6	9.1	35.5
Scheduled tribe	2.2	20.7	3.2	26.3	52.3	4.2	24.6	0.4	10.9	40.1
Other backward caste	3.8	21.4	2.4	19.7	47.2	8.0	18.1	0.5	8.2	34.8
Other	2.7	19.0	2.6	15.8	40.0	6.6	13.8	0.5	8.5	29.4
Religion										
Hindu	3.4	19.8	2.8	19.5	45.6	7.1	16.6	0.4	9.5	33.6
Muslim	4.0	18.5	2.8	17.0	42.4	9.7	15.1	0.6	5.8	31.2
Christian	2.2	29.9	1.8	14.3	48.2	3.1	19.5	0.0	9.2	31.8
Other	1.7	17.3	2.2	8.5	29.7	2.5	22.5	0.0	4.4	29.4
Parity at the End of Episode										
0	2.9	47.9	2.2	21.9	75.0	8.1	34.8	0.8	9.6	53.3
1	3.7	20.0	3.9	18.4	46.0	8.4	18.3	0.4	10.3	37.4
2	2.3	12.1	2.1	16.0	32.5	7.7	12.5	0.2	9.2	29.6
3+	4.4	9.6	2.4	19.1	35.4	6.4	11.0	0.5	6.8	24.7
Contraceptive Intention										
Spacing	4.2	30.0	3.6	19.7	57.4	8.4	25.5	0.5	8.5	42.9
Limiting	2.7	8.8	1.9	17.3	30.8	6.3	6.6	0.4	9.0	22.4
Wealth Quintile										
Poorest	5.4	22.5	2.8	26.9	57.6	7.5	19.3	0.4	5.9	33.1
Poorer	4.9	20.7	1.9	24.8	52.4	9.8	15.9	0.3	8.6	34.6
Middle	2.9	21.8	2.9	19.1	46.7	7.0	15.1	0.2	8.5	30.8
Richer	2.7	19.0	3.9	17.7	43.3	6.8	13.9	0.9	11.2	32.8
Richest	2.8	17.8	2.2	13.5	36.4	4.4	15.7	0.3	12.2	32.6
Region										
North	2.4	19.9	2.2	9.7	34.1	3.0	16.9	1.0	5.6	26.6
Central	5.0	17.4	2.4	20.5	45.3	10.5	17.2	0.6	8.0	36.2
East	4.5	19.2	2.3	26.0	51.9	8.3	13.8	0.2	8.7	31.0
North-east	2.6	19.3	2.6	35.2	59.6	3.5	15.1	0.2	9.0	27.8
West	0.6	22.1	4.7	13.5	41.0	3.7	21.7	0.1	9.7	35.3
South	2.5	25.0	3.7	19.6	50.8	3.2	21.9	0.4	13.5	39.0
Household Structure										
Nuclear	3.5	15.0	2.8	18.6	39.9	6.9	13.4	0.2	7.7	28.2
Non-nuclear	3.4	22.7	2.7	18.5	47.4	7.9	19.3	0.6	9.6	37.4
Total	3.4	19.6	2.8	18.5	44.3	7.4	16.5	0.4	8.7	33.1

** Not shown due to less than 125 unweighted cases.

Table 4. Coefficients and Standard Errors of the Factors Associated with the Reasons of Contraceptive Discontinuation, India, 2000-2006

Characteristics	Reason for Discontinuation					
	Failure/Continued		Side Effect and Other/Continued		Reduced Need/Continued	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-4.925***	0.161	-4.009***	0.096	-2.653***	0.149
Duration	0.268***	0.039	-0.224***	0.016	0.532***	0.012
Duration square	-0.022***	0.005	0.023***	0.002	-0.015***	0.001
Age at the End of Episode						
<25 years (ref)	0.000	-	0.000	-	0.000	-
25-34 years	-0.910***	0.062	-0.891***	0.036	-0.742***	0.055
>=35 years	-1.897***	0.118	-1.376***	0.061	-0.462***	0.096
Place of Residence						
Urban (ref)	0.000	-	0.000	-	0.000	-
Rural	-0.031	0.061	0.160***	0.035	0.559***	0.065
Educational Attainment						
No education	0.000	-	0.000	-	0.000	-
<5 years of education	-0.026	0.102	0.027	0.065	-0.203	0.124
5-9 years of education	0.037	0.070	-0.008	0.046	-0.007	0.084
10 or more years of education	-0.033	0.090	0.017	0.054	0.053	0.098
Parity at the End of Eepisode						
No child (ref)	0.000	-	0.000	-	0.000	-
1-2 children	-0.282**	0.088	-0.564***	0.054	-1.461***	0.060
3 or more children	0.123	0.110	-0.264***	0.067	-1.726***	0.094
Contraceptive Method						
Traditional methods (ref)	0.000	-	0.000	-	0.000	-
Pill	-0.847***	0.074	1.295***	0.040	0.413***	0.056
IUD	-1.902***	0.162	0.835***	0.053	-1.311***	0.092
Condom	-0.407***	0.066	0.891***	0.043	0.448***	0.053
Contraceptive Intention						
Spacing (ref)	0.000	-	0.000	-	0.000	-
Limiting	-0.358***	0.060	-0.031	0.035	-1.648***	0.056
Caste						
Scheduled Castes/Tribes (ref)	0.000	-	0.000	-	0.000	-
Other backward castes	-0.038	0.073	0.117**	0.045	0.185*	0.082
Other	0.001	0.069	0.007	0.042	0.138	0.076
Religion						
Hindu (ref)	0.000	-	0.000	-	0.000	-
Muslim	0.176*	0.068	-0.176***	0.044	-0.063	0.080
Other	0.252**	0.087	-0.160**	0.052	0.168	0.090
Wealth Quintile						
Poorest (ref)	0.000	-	0.000	-	0.000	-
Poorer	-0.020	0.079	0.007	0.057	-0.260*	0.103
Middle	-0.211*	0.090	0.153*	0.059	-0.054	0.107
Richer	-0.260**	0.099	0.088	0.064	-0.277*	0.116
Richest	-0.431***	0.114	-0.043	0.070	-0.453***	0.127
Region						
North (ref)	0.000	-	0.000	-	0.000	-
Central	0.923***	0.096	0.696***	0.053	0.344***	0.093
East	0.537***	0.102	0.568***	0.056	-0.056	0.099
North-east	0.465***	0.102	0.687***	0.055	0.178	0.094
West	-0.215	0.143	0.275***	0.065	0.113	0.108
South	0.627***	0.137	0.796***	0.068	0.881***	0.119
Random Effect Variance						
Individual level	0.307***	0.080	1.100***	0.037	10.012***	0.136

Significant at *p<0.05; **p<0.01; ***p<0.001