

**An analysis of contraceptive discontinuation among female, reversible method users  
in urban Honduras**

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## **ABSTRACT**

A panel study examining the effects of individual characteristics, side effects experienced, and service quality on contraceptive discontinuation was undertaken in four urban areas of Honduras. The data were collected October 2006-December 2007. The baseline population included 800 women aged 15-44 who were new or continuing users of the injectable, IUD, or oral contraceptive pill. A total of 671 women (84%) were re-interviewed after one year. Life tables and Cox proportional hazards models are used to present discontinuation rates and factors associated with contraceptive discontinuation. Among new users, discontinuation of the baseline method at twelve months was high (45%); especially for users of the injectable (50%). In the hazards model, service quality had little effect on discontinuation, while individual characteristics and the experience of specific side effects showed significant effects. The results suggest that programs should emphasize continuous contraceptive coverage rather than continuous use of a particular method.

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## **INTRODUCTION**

Effective contraceptive use implies that women use an effective method of contraception to delay or avoid pregnancy until such time as they want another child or no longer need contraception. Premature discontinuation can lead to unplanned pregnancy and unwanted births, which in turn may result in negative public health consequences such as increased maternal, neonatal and infant morbidity and/or mortality (Marston and Cleland 2003; Conde-Agudelo, Rosas-Bermúdez et al. 2006; Barden-O'Fallon, Speizer et al. 2008). Contraceptive discontinuation also contributes to unmet need for family planning, which represents women who no longer want to get pregnant or want to delay a pregnancy and are sexually active but are not using a method of contraception to avoid or delay a pregnancy (Jain 1999; Casterline, El-Zanatay et al. 2003).

Contraceptive discontinuation is common, occurring most often during the first twelve months of adoption of a method. Actual levels of discontinuation vary according to country: a recent summary of 18 Demographic and Health Survey (DHS) data found that 20-50% of users of reversible modern methods discontinued their method during the first twelve months of use (Vadnais, Kols et al. 2006). Often, discontinuation is due to reasons other than to become pregnant: only 3-8% of users in the above analysis discontinued in order to become pregnant (Vadnais, Kols et al. 2006). Prior research found that discontinuation due to 'reduced need' (a broader category including the desire to become pregnant, infrequent sex, absence of husband/partner, menopause or subfecundity, and marital dissolution/separation) ranged between 7 and 20% of users of all reversible methods (Blanc, Curtis et al. 2002). These findings indicate that the majority of contraceptive discontinuation is indeed likely to be "premature."

Understanding the factors that affect discontinuation of family planning use is crucial to ensuring that women and couples can attain their long-term fertility desires. Earlier research on the determinants of contraceptive discontinuation has focused on demographic characteristics and fertility motivations of users, the quality of family planning services or the family planning service environment, and the experience of side effects while using a method. Results from this research demonstrate that women who are younger, of higher parity, and unmarried or not in union, are the most likely to discontinue a method (Ali and Cleland 1995; Curtis and Blanc 1997). Other demographic factors, such as education, place of residence, and household income have tended to have less consistent relevance for discontinuation (Curtis and Blanc 1997; Ali and Cleland 1999; Zhang, Tsui et al. 1999). Fertility desires and other individual-level characteristics of the woman, such as the level of motivation to prevent pregnancies, self-efficacy and autonomy, are also considered to be directly related to contraceptive discontinuation (Blanc 2001). Partner involvement in contraceptive discontinuation is not yet well understood, though has been found to be associated with method choice (Pariani, Heer et al. 1991).

Research on the family planning service environment includes studies on the relationship between access, cost, and quality of services, and the continued use of contraceptives. While many studies have not identified statistically significant associations between the service environment and discontinuation, others have found that when there are significant effects, the size and programmatic significance is relatively small (Koenig, Hossain et al. 1997; Steele, Curtis et al. 1999; León, Roca et al. 2003; RamaRao,

Lacuesta et al. 2003; Do and Koenig 2007). Furthermore, the expected positive association between the number of methods available and contraceptive continuation has not been established (Steele, Curtis et al. 1999).

Another important line of research is on the impact of side effects on discontinuation. Side effects are one of the most often cited reasons for discontinuing contraception, particularly hormonal contraception (Janowitz, Kane et al. 1986; Ali and Cleland 1995; Khan 2001; Savabi-Esfahany, Fadaei et al. 2006). In the summary report using DHS data for 18 countries referenced earlier, more than 20% of women who discontinued using contraception did so because of side effects (the percentage was less than 10% in only two of the sampled countries) (Vadnais, Kols et al. 2006). It is not clear whether more information or better counseling on side effects will improve contraceptive continuation among women who go on to experience side effects. It is also not clear why after experiencing side effects some women discontinue use of contraception altogether, others switch methods, and still others continue using the same method. Some researchers suggests that it is not just the physiological experience of side effects, but the specific type of side effect and how it is perceived by women, their partners, and the community (Cheung and Free 2004; Tolley, Loza et al. 2005; Alam, Bradley et al. 2007). For example, prolonged or heavy menstrual bleeding is problematic in Bangladesh because menstruation is culturally taboo (Alam, Bradley et al. 2007). Such findings suggest that the impact of side effects on daily life has important consequences for contraceptive use.

It is notable that while there is a large body of research on factors related to contraceptive discontinuation, most of these studies did not consider multiple factors at

the same time (other than individual demographic characteristics in combination with side effects, or service quality, for example). The overall goal of this study is to determine how, together, multiple dimensions including: demographic characteristics, fertility motivations and partner engagement, quality of family planning service, experience of and reaction to side effects, and method characteristics, affect contraceptive discontinuation among users of temporary methods over a one-year period. While many of these factors have separately been shown to be important to contraceptive adoption and continuation, especially for reversible methods, they have not all been examined simultaneously to determine how they jointly affect contraceptive continuation, controlling for method used. This study, therefore, goes beyond previous research by assessing the relative importance of these different dimensions on contraceptive continuation and making programmatic recommendations for improved contraceptive use and reduced unmet need for family planning.

## **METHODS**

The data come from a panel study of women from four urban areas of Honduras: Tegucigalpa, San Pedro Sula, Santa Rosa de Copán/La Entrada, and Gracias. The objective of the study was to examine contraceptive continuation patterns among users of female reversible contraceptive methods (the pill, injection, and IUD). The data were collected in two rounds, a baseline interview and a follow-up interview 12-15 months later. The baseline data come from exit interviews held with eligible women attending a family planning appointment in selected health facilities in which they received the injection, oral contraceptive pill, or IUD. Selected clinics for the study included seven Secretary of Health clinics (CESAMOs), one Secretary of Health hospital, and five

Honduran Family Planning Association (ASHONPLAFA) clinics. These types of facilities are the most common providers of female reversible family planning methods in the four cities visited. Eligible women were aged 15-44, and were either new or continuing users of one of the three aforementioned female, reversible methods. There were no enrollment quotas by type of method. Baseline data were collected from 800 women (about 200 per location) between October-November 2006. Follow-up data were collected after at least 12 months (and at most 15 months) with the same women as interviewed at baseline. Interviewers used contact information provided by the respondents at baseline to locate and arrange for the follow-up interviews. Follow-up interviews were conducted in October-December 2007. A total of 671 women (84%) were found and interviewed at follow-up.

The baseline survey questionnaire collected information on demographic characteristics, birth histories, previous use of contraception, perception of service quality at clinic appointment, motivation to avoid pregnancies, and the family planning decision-making environment. The follow-up questionnaire collected information on the use of contraception during each month since the baseline interview, and the experience of and reactions to side effects. Follow-up data collection also obtained updates on demographics (e.g., marital status and residence), fertility motivations, and the decision-making environment.

Authorization for the study was obtained from the Institutional Review Board (IRB) of the University of North Carolina at Chapel Hill, the Honduran Secretary of Health, and

ASHONPLAFA. Informed consent was obtained from each participant at baseline and follow-up.

### *VARIABLES*

Independent variables for the analysis are grouped as a) demographic characteristics, b) fertility motivations and partner/community engagement, c) experience with side effects, d) service quality measures, and e) method characteristics. The demographic characteristics included in the study are age (15-24, 25-34, and 35-44); education (none, primary, and secondary or higher); parity (0-1 child, 2-3, and 4 or more); and marital status (currently married or in union versus not in union). Although clinics involved in the study are located in major urban areas, many women had traveled from rural areas to the cities to visit the clinics. An area of residence variable (urban versus rural) is thus also included. Because some women's marital status and place of residence may change between baseline and follow-up, and this could be related to contraceptive continuation, the follow-up responses are used for this analysis (see Table 1 for list of variables and a notation for which variables come from the follow-up interview).

Fertility motivations were assessed at baseline by asking women if they want another child soon/now, want to delay a birth for 2 or more years, want another child but don't know when, want no more children, or are undecided. As a measure of partner engagement, at the follow-up interview, the amount of discussion of family planning with partners during the previous 12 months was assessed, and is coded as never (or no partner), 1-2 times, or more often. Each woman was also asked whether she felt her partner wanted more, fewer, or the same number of children as herself; fewer, same, and



don't know or not in union were regrouped for this analysis to permit an assessment of whether the partner wanting more is associated with contraceptive continuation compared to all others.

At follow-up, women were asked about the number of side effects experienced (responses ranged from 0-6 and are coded as 0, 1, 2, and 3+). Women also were asked whether they experienced specific side effects including heavy bleeding, weight gain, dizziness, headaches, amenorrhea, or abdominal pain (all asked as yes/no questions). Women were also asked if the side effects interfered with their 1) daily life and/or 2) personal relationships with spouse or partner. The responses were combined for analysis (yes to either interference question versus no to both). Whether women had discussed any health concerns or contraceptive side effects with friends, neighbors, or relatives in recent months (yes/no) was also assessed as a measure of community engagement.

A number of questions relating to the quality of counseling and service provision were assessed at the baseline exit interview. The indicators of service quality included, among others, the number of methods discussed during the appointment; whether the client was told about the advantages and disadvantages of her method; whether the client felt all her questions had been answered; and whether information had been given on method characteristics, including how to use the method effectively. In addition, women were asked if they had ever, at this appointment or anytime previously, been informed by a health care worker about the side effects of their method (yes/no). Other questions on women's experiences at the clinic appointment were also asked, these included the client's level of satisfaction with: the cleanliness of the clinic; the level of privacy; the

way she was treated by the provider; and overall satisfaction with care received. These questions, however, showed little variation (fewer than 10% responding in the negative) and are therefore not included in the analysis.

Finally, type of method used at baseline (injectable, pill, or IUD) and length of method use at baseline (new user of family planning/new to method, use of method one year or less, and use of method for more than one year) and are also included in the analysis.

### *ANALYSIS METHODS*

Descriptive statistics of the study population are presented for the variables described above. Also presented is information on the number of discontinuations during the study by baseline method and length of method use at baseline. For these statistics, only the first 12 months of the study period are considered, when all women were contributing information.

The above information will give a snapshot view of discontinuations occurring during the twelve month study period by method type and length of use at baseline; however, because discontinuations occurred at different times throughout the study period, life table analysis is used to provide information on the pace of discontinuation during the study. Discontinuation rates for the first six and twelve months of use are calculated only for the group of women who were initiating a method at baseline. Discontinuation rates are obtained by constructing life tables with information collected in a month-by-month calendar of contraceptive use covering the study period. We present discontinuation rates by method type for the baseline method (i.e. until the first month of non-use of the

baseline method). Life tables are also used to determine the transition rates from user status to non-user status (i.e. use until the first month of non-use of any method); this analysis takes into consideration the fact that many of the women who discontinued their baseline method switched to another method without missing one month of coverage. These rates are also presented by baseline method.

Cox proportional hazards models are performed on the full sample to simultaneously assess the association of individual characteristics, fertility motivation and partner engagement, experience of side effects, service quality indicators, and method characteristics, with the likelihood of discontinuation. Separate models are run for 1) discontinuation of the baseline method and 2) first episode of non-use of any method. The definitions of variables used in the regression analyses are presented with the results in Table 5. In the Cox proportional hazards model, the baseline hazard ratio when all covariates are set to zero equals the odds of an event occurring; the event may occur sooner or later with the addition of covariates. A hazard ratio (HR) below 1.0 means that increases in the covariate reduce the hazard (“risk” or “likelihood”) of the event occurring, while a HR above 1.0 increase the likelihood of the event occurring. In both Models, method type is used as a strata variable, which allows the baseline hazard functions to vary according to method type (injectable, pill, or IUD). Coefficients for method type are thus not calculated. Scaled Schoenfeld residuals are used to assess the assumption that HRs are proportionate over time for all covariates. Due to the high number of tied failure events in the data, the Efron method is used to handle tied failures. Cox-Snell residuals are used to test the fit of the data to the Cox regression. The analyses were run using STATA version 10.1 (StataCorp. 2007).

## RESULTS

A total of 800 women were enrolled at baseline and 671 of these women (84%) were interviewed at follow-up. No significant differences were found in terms of baseline age, marital status, residence, and method use at baseline between the women interviewed at follow-up and the full sample of women interviewed at baseline (Barden-O'Fallon, Speizer et al. 2008). A profile of the 671 women interviewed at baseline and follow-up is presented in Table 1. The table shows that the study population is young; the vast majority (94%) is under the age of 35. Most women have had at least some education (94%), with almost 30% having reached a secondary or higher level of education. Only 3% of the women did not have any children at baseline, while 83% had between one and three children. Being married or in union is common (89%); at baseline, among the 671 women interviewed at follow-up, 94% were in union. Approximately 23% of women who were interviewed in the city for the baseline clinic appointment currently reside in a rural area; these rural women may have been in the city for other reasons as well, including attending work or visiting the market.

Table 1 indicates that nearly 50% of the women in the panel sample who were using an effective female reversible method of family planning at baseline wanted to space a future birth by two or more years at the time of the baseline interview. Another third of these women wanted no more children. Notably, about 18% of women wanted a child soon (within two years) or were undecided about future fertility desires. These women may be ambivalent users of family planning (see Barden-O'Fallon et al., 2008 for a more in depth discussion of ambivalence in this study population). At follow up, one-fifth of

the women in this analysis report that their husband wants more children than them. The remaining women report that their husband wants fewer children, the same number, or that they don't know their husband's fertility desires. In this sample, discussion of family planning with partners is common. At the follow-up interview, nearly half of the women report discussing family planning with their partner three or more times in the last year. Another one-third of women report that they discussed family planning one or two times in the last year.

Other factors associated with contraceptive continuation include experience with side effects, quality of services received, and characteristics of the methods; these are presented in Table 1. At the follow-up interview, one-third of the women reported experiencing no side effects in the one-year follow-up period.<sup>1</sup> The remaining two thirds of women experienced at least one or more side effect, with 17% reporting experience of three or more side effects. The most common side effects reported were headaches and amenorrhea. One third of all women reported that side effects interfered with their daily life or personal relationships (Note that the figure would be higher if women without any side effects were not included in the denominator; among only the group of women experiencing side effects, the proportion reporting interference in daily life or personal relationships is greater, at 51%.) Less than half of the women reported discussing side effects or health concerns with family and friends in recent months.

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<sup>1</sup> The experience of side effects among Honduran users of reversible family planning methods has been discussed in more depth using qualitative and quantitative data by Barden O'Fallon and colleagues (Barden O'Fallon et al., 2009).

At baseline, women were asked about their prior experiences with health care providers and exposure to information on family planning methods. It is demonstrated in Table 1 that nearly two-thirds of women report ever being told about side effects of family planning methods. Only about a third of women, however, report that they were told about the advantages and disadvantages of the current method at the baseline appointment. Additionally, 43% of women report that they were told how to use their current method effectively, while 58% reported that the provider answered all of their questions. Furthermore, only one-third of women report that their provider discussed at least two methods with them at the baseline appointment. Taken together, these variables provide a perspective of inadequate service quality among these users of a female reversible family planning method at baseline.

At baseline, the overwhelming majority of participants were using injectables (72%). The IUD was being used by 21% of the sample while only 7% were using the pill. Among users at baseline, nearly half were beginning the method on the day of interview, either having never used the method before or re-adopting the method after a period of non-use. One fifth of the women were recent adopters of their baseline method and one third had been using the baseline method for more than a year. It is expected that the new users would be the most likely to discontinue a method in the follow-up period whereas the women who had been using for a longer period of time will be the most likely to continue over the one year follow-up period.

Method discontinuation was common during the twelve month study period as 273 women (41%) discontinued their baseline method. As expected, discontinuation varied

by method and was highest among users of the pill (49%) and injectable (44%) and lower for users of the IUD (28%) (see Table 2). In relation to the length of method use at baseline, discontinuation was indeed most frequent among new users (45%) as compared to those women who had been using for less than a year (39%) and those who had been using for more than a year (36%). Among women who discontinued, method switching was also common: 118 women (43%) continued using another method of contraception. Overall, method-switching occurred for almost one-fifth (18%) of the total study sample. A small percent of women who switched methods went on to discontinue again (4%). Switching occurred more often among new users (22%) and users of less than or equal to one year (19%) as compared to users of more than one year (10%). Method switching was almost equally frequent by baseline method (17-19%).

During the study period, 167 women (25%) experienced one month or more of non-use (data not shown in tables). Some of the non-use was due to pregnancy: there were 47 pregnancies (7% of the sample) in the twelve month follow-up, 37 (79%) of which were among women who used the injectable at baseline. Of these pregnancies, 16 (34%) were reported as being wanted at the time of pregnancy, 22 (47%) were reported as being wanted at a later time, and 9 (19%) were reported by women wanting no more children.

Discontinuation of the baseline method was most often due to problems with the method (65.6%), mainly from side effects (55.3%) and becoming pregnant while using the method (4.8%) (results not shown in tables). The second most common category of reasons to discontinue the baseline method was due to reduced need (28.6%): women in this category most often reported infrequent sex (9.5%) wanting to become pregnant

(8.8%), and marital dissolution (8.8%). Finally, access to contraceptive methods also played a small role in discontinuation of the baseline method (4.8%): women with responses in this category most often reported missing appointments (1.5%) and a lack of time (1.1%). Based on these results, it was decided that there was not enough variation in reasons for discontinuation to calculate discontinuation rates by reason.

The overall discontinuation rates for the 324 (48%) women starting a method at baseline are 0.23 at six months and 0.45 at twelve months (Table 3). This indicates that 23% of women initiating a method at baseline discontinued use of the method by six months of use while 45% discontinued use of the method by twelve months of use. However, many of these women switched to another method during the study period. An examination of time until first episode of non-use shows that 12% of women initiating a method at baseline experienced an episode of non-use by six months and 25% by one year (Table 4). The injectable has the highest rates of discontinuation at six and twelve months; a full 50% of women initiating the injectable at baseline discontinued its use by one year, and 30% of women initiating use of the injectable experienced an episode of non-use by one year. Although the IUD has the lowest levels of discontinuation among the three methods, almost one-third of women initiating the IUD discontinued use by twelve months. However, many IUD users then switched to other methods without experiencing an episode of non-use.

Results of the survival analysis on the factors associated with discontinuation of the baseline method (Model 1) and experience of an episode of non-use (Model 2) are shown in Table 5. It should be noted that in Model 1, the variable for weight gain did not pass



the assumption of proportionality, suggesting that the coefficient estimate is inflated over time. However, Model 1 did pass the global test of proportionality. All coefficients in Model 2, as well as the global model, pass the assumption of proportionality. Graphs of the Cox-Snell residuals show that the fit of the data to the Cox regression models is satisfactory (not shown).

Table 5 demonstrates that being over 25 years old, having a parity of 0 or 1, and not being currently in union are significantly associated with an increased likelihood of method discontinuation. However, only union status is associated with an increased likelihood of experiencing an episode of non-use. In addition, living in an urban area, though not significantly related to method discontinuation, was found to be moderately related to a 26% reduction in the likelihood of experiencing an episode of non-use (with a p-value of 0.095).

Baseline fertility desires are also significantly associated with the likelihood of baseline method discontinuation and discontinuation of all methods (i.e. non-use). The risk of experiencing an episode of non-use is double for women who desire another child within two years than for women who want to delay or avoid a birth. While variables reflecting partner attitudes and involvement were not found to be significant, an interesting finding is that the variable assessing interaction with friends and family regarding health concerns and/or side effects is shown to be significant in both models, and associated with a 25% reduction in the likelihood of discontinuation.

Discontinuation of the baseline method is associated with women experiencing heavy bleeding, weight gain, or dizziness while using their method. In contrast, an episode of non-use is only significantly associated with heavy bleeding. This finding merits further investigation to determine why this is the case. Furthermore, while women were more likely to discontinue their baseline method if they felt the side effects interfered with their daily life or personal relationships, the experience did not seem to dissuade women from switching to another method, as the variable was not statistically associated with an episode of non-use.

In this study, service quality indicators had little association with contraceptive discontinuation. Of the four measures included in the regression models, the only significant variable is whether women felt that the provider had answered all of her questions at the baseline clinic appointment. Women who felt that all their questions were answered had a 24% reduced likelihood of experiencing an episode of non-use as compared to women who did not feel this way.

Finally, women who were new users of a method at baseline were not significantly more or less likely to discontinue or experience an episode of non-use than women who were already using their method at baseline.

## **Conclusion**

Discontinuation of the baseline method was high for this study population: more than 4 out of 10 women discontinued the use of their baseline method in the 12 month period. This finding provides evidence that during any given year, discontinuation will

be a common event in the populations typically served by clinics, that is, populations comprised of new family planning users, method switchers, re-adopters, and continuing users. Though new users were found to discontinue more often than continuing users, the continuing users were almost as likely to contribute to discontinuations, even among women who had been using their method for more than one year at baseline. In Honduras, the most common method of contraception is female sterilization; more than one-fifth of all currently married women age 15-49 are sterilized ([Honduras], (INE) et al. 2006). This implies that reversible methods are more often used for child spacing and that high rates of method discontinuation are to be expected. In this regard, high discontinuation is not necessarily a negative outcome, as long as women who still want to delay or limit childbearing are able to adopt an alternate method. This requires that providers be prepared for contraceptive discontinuation: that a full array of methods is available (even when one method is widely popular); and that women are encouraged to return to a provider if they have problems with a method. The study results suggest that many women were able to successfully switch to another method after discontinuation, even after the experience of side effects, but that living in a rural location may limit the ability to successfully do so.

In the multivariate analysis, indicators of service quality had little effect on discontinuation over the course of the study. However, a client-based approach to counseling is supported by the finding that the likelihood of experiencing an episode of non-use decreases for women who felt all their questions had been answered by the provider. Overall, in terms of contraceptive continuation, counseling and the provision of information in Honduras appear to be sufficient, with results suggesting that providers

focus efforts on maintaining contraceptive coverage in an environment of high method discontinuation.

The multivariate analysis also shows that discussions with friends and family members may play a positive role in the decision to continue or discontinue contraception, which indicates the importance of social support for the use of contraception. Family planning programs are advised to build on these sources of support by widely promoting the dissemination of new and accurate information and keeping family planning issues in the public sphere.

This manuscript presents results for a unique study in which longitudinal data was collected to better understand the effects of various factors on contraceptive discontinuation. In this regard, it is one of only a few studies able to assess service quality with longitudinal data. The study also provides a rich source from which to examine the multiple influences on discontinuation. However, there are also some important limitations to the study which merit attention. The study population is comprised of women attending ASHONPLAFA and Ministry of Health clinics, which are the main sources of modern contraceptives in Honduras. It is not known how contraceptive use in this population differs from that of women attending other types of service providers, such as social security hospitals, other private clinics, pharmacies (where pills can be obtained), community dispensaries, etc. In addition, we focused on high-volume clinics in Tegucigalpa and San Pedro Sula (other cities in the study did not have more than one eligible clinic). We do not know how the client base or services may vary in ASHONPLAFA and Ministry of Health facilities not participating in the study. It

was the investigators' intent that the results serve the country and be responsive to programming initiatives; for this reason Santa Rosa de Copán and Gracias (in the less-developed, Western zone of the country) were chosen as study sites in addition to Tegucigalpa and San Pedro Sula (the most populous cities in the country). Other urban areas are not represented in this data and thus the data cannot be taken to be representative of urban Honduras in general.

To conclude, this study demonstrates that while discontinuation is common among users of reversible female methods of contraception, a certain amount of this discontinuation is expected, given that women who want to space a birth are the most likely to use the methods under consideration. That said, women are also experiencing side effects and need greater support for continued contraceptive use through counseling on side effects and other methods that can be adopted if problems arise. These types of targeted programs that provide all women with information on side effects and approaches to switching methods can lead to a reduction of unintended pregnancies and improved maternal and child health outcomes in Honduras and elsewhere where contraceptive discontinuation is common.

**Table 1. Characteristics of study population, Honduras, 2006-2007; N=671**

<b>Demographic Characteristics</b>	<b>%</b>
Age	
15-24	54.2
25-34	39.8
35-44	6.0
Education	
None	5.8
Primary	64.5
Secondary or higher	29.7
Number of children ever born	
Zero-one	44.1
Two-three	42.2
Four or more	13.7
Marital status*	
Married or in union	89.3
Not in union	10.7
Residence*	
Urban	77.4
Rural	22.6
<b>Fertility Motivations and Partner Engagement</b>	
Desire for more children	
Have more children in less than 2 years	11.8
Have more children in 2 or more years or DK when	47.4
Have no more children	34.4
Undecided	6.4
Discussed family planning with partner in last 12 months*	
Never	20.7
1-2 times	32.5
More often	46.8
Feels partners wants...*	
More children than her	20.3
Less children, the same number, or DK	79.7
<b>Experience with side effects</b>	
Number of side effects experienced*	
0	32.9
1	27.0
2	22.8
3+	17.3
Experienced heavy bleeding*	14.2
Experienced weight gain *	11.0
Experienced dizziness*	13.0
Experienced headaches*	26.7
Experienced amenorrhea*	22.1
Experienced abdominal pain*	14.8
Felt side effects interfered with daily life or personal relationships*	34.4
Discussed health concerns or side effects with family, friends in recent months*	44.7

**Table 1. Characteristics of study population cont'd, Honduras, 2006-2007; N=671**

<b>Service Quality</b>	
Number of methods discussed by provider	
0-1	67.5
2-6	32.5
Was told about advantages & disadvantages of method	35.6
Felt provider answered all her questions	58.0
Was told how to use method effectively	42.8
Was ever informed by health care provider <sup>a</sup> about side effects of method	61.6
<b>Method Characteristics</b>	
Method used at Baseline	
Injectable	72.4
IUD	20.9
Pill	6.7
Length of use at enrollment	
New user/new to method	48.3
Less than or equal to 1 year	20.3
More than 1 year	31.5

\*Assessed at Follow-up; otherwise assessed at Baseline

<sup>a</sup> Only this indicator refers to service prior to day of interview

**Table 2. Number of discontinuations during twelve month study period, by method and length of use at baseline, N=671**

	No Discontinuation n=398 (59%)	One Discontinuation n=247 (37%)	Two Discontinuations* n=26 (4%)	Total N=671 (100%)
Injectables	274 (56.4)	194 (39.9)	18 (3.7)	486 (100)
Pills	23 (51.1)	20 (44.4)	2 (4.4)	45 (100)
IUD	101(72.1)	33 (23.6)	6^ (4.3)	140 (100)
New user	179 (55.3)	125 (38.6)	20^ (6.2)	324 (100)
<= 1 year use	83 (61.0)	50 (36.8)	3 (2.2)	136 (100)
> 1 year use	136 (64.5)	72 (34.1)	3 (1.4)	211 (100)

\*First discontinuation is of baseline method, second is of other method

^Includes one woman who discontinued 3 times during the 12 months



**Table 3. Discontinuation rate of baseline method at six and twelve months after initiation among new users, by baseline method, N=324**

Baseline Method	Discontinuation Rate of Baseline Method	
	@ 6 month	@ 12 month
Injectable	0.25	0.50
IUD	0.16	0.31
Pills	0.22	0.44
TOTAL	0.23	0.45

**Table 4. Transition to first episode of non-use, assessed at six and twelve months after initiation among new users, by baseline method, N=324**

Baseline Method	Transition to First Episode of Non-Use	
	@ 6 month	@ 12 month
Injectable	0.14	0.30
IUD	0.07	0.12
Pills	0.06	0.28
TOTAL	0.12	0.25

**Table 5. Cox proportional hazards model on time until discontinuation of baseline method (Model 1) and first episode of non-use of any method (Model 2), by demographic characteristics, fertility motivations and partner engagement, experience of side effects, baseline service quality, and method characteristics, N=671**

	Model 1	Model 2
<b><u>Demographic Characteristics</u></b>		
Age 25 or older (REF: age <=24) (BL)	1.34**	1.21
Education level secondary or higher (REF: none or primary) (BL)	1.03	0.88
Parity 0 or 1 (REF: 2+) (BL)	1.35**	0.92
Not currently in union <sup>a</sup> (FU)	1.97***	2.27***
Urban residence (REF: Rural residence) (FU)	0.94	0.74*
<b><u>Fertility Motivation &amp; Partner Engagement</u></b>		
Desires children <= 2years) (REF: wants more children >2 years, wants no more children, undecided) (BL)	1.40*	2.04***
Feels partner wants more children than she does (FU)	0.84	1.15
Discussed family planning with partner in last year (FU)		
Never	0.84	0.96
1-2 times (REF)	REF	REF
More often	1.05	0.86
Discussed health concerns or side effects with family/friends in recent months	0.75**	0.75*
<b><u>Experience of Side Effects (Assessed at Follow-up)</u></b>		
Experienced heavy bleeding	2.07***	1.94***
Experienced weight gain	1.85***	1.24
Experienced dizziness	1.56***	1.29
Experienced headaches	0.94	0.96
Experienced amenorrhea	1.17	1.32
Experienced abdominal pain	1.20	0.97
Side effects interfered with daily life or personal relationships	1.79***	1.24
<b><u>Service Quality (Assessed at Baseline)</u></b>		
Was ever informed by health care provider about side effects of method	1.24	1.24
Was told how to use method effectively	1.11	1.03
Felt provider answered all her questions	0.98	0.76*
Provider discussed 2 or more methods	1.09	1.07
<b><u>Method Characteristics</u></b>		
New user at baseline (REF: already user of method at BL)	1.25	1.08

Models 1 and 2 stratified by baseline method type

BL=Baseline; FU=Follow-up

<sup>a</sup> Reference categories are the null unless otherwise stated

\*\*\* p<0.01; \*\*p<0.05, \*p<0.1

## References

- [Honduras], S. d. S., I. N. d. E. (INE), et al. (2006). Encuesta Nacional de Salud y Demografía 2005-2006. Tegucigalpa, Honduras, SS, INE and Macro International.
- Alam, M.-E., J. Bradley, et al. (2007). IUD use and discontinuation in Bangladesh. E&R Study #8. New York, Engender Health/The ACQUIRE Project.
- Ali, M. and J. Cleland (1995). "Contraceptive discontinuation in six developing countries: a cause-specific analysis." International Family Planning Perspectives **64**(3): 92-97.
- Ali, M. and J. Cleland (1999). "Determinants of contraceptive discontinuation in six developing countries." Journal of Biosocial Science **31**(3): 343-360.
- Barden-O'Fallon, J. L., I. S. Speizer, et al. (2008). Contraceptive discontinuation: A one-year follow-up study of female reversible method users in urban Honduras. Chapel Hill, NC, MEASURE Evaluation and PRODIM (Tegucigalpa, Honduras).
- Barden-O'Fallon, J. L., I. S. Speizer, et al. (2008). "The association between contraceptive discontinuation and pregnancy intentions in Guatemala." Revista Panamericana de Salud Publica **23**(6): 410-417.
- Barden-O'Fallon, J.L., I.S. Speizer, et al. (2008). "Motivations to avoid childbearing among contraceptive users in Honduras: Which women are ambivalent? Poster presented at the Annual Meeting of the European Population Conference, Barcelona, Spain.
- Barden-O'Fallon, J.L., I.S. Speizer, et al. (2009). "Experience with side effects among users of injectables, the IUD, and oral contraceptive pills in four urban areas of Honduras." Health Care Women Int **30**(6):475-483.
- Blanc, A. (2001). "The effect of power in sexual relationships on sexual and reproductive health: An examination of the evidence." Studies in Family Planning **32**(3): 189-213.
- Blanc, A., S. Curtis, et al. (2002). "Monitoring contraceptive continuation: Links to fertility outcomes and quality of care." Studies in Family Planning **33**(2): 127-140.
- Casterline, J., F. El-Zanatay, et al. (2003). "Unmet need and unintended fertility: Longitudinal evidence from upper Egypt." International Family Planning Perspectives **29**(4): 158-166.
- Cheung, E. and C. Free (2004). "Factors influencing young women's decision making regarding hormonal contraceptives: a qualitative study." Contraception **71**(6): 426-431.
- Conde-Agudelo, A., A. Rosas-Bermúdez, et al. (2006). "Birth spacing and risk of adverse perinatal outcomes: a meta-analysis." JAMA **295**: 1809-1823.

- Curtis, S. L. and A. K. Blanc (1997). Determinants of contraceptive failure, switching, and discontinuation: An analysis of DHS contraceptive histories. Calverton, Maryland, Macro International Inc.
- Do, M. and M. Koenig (2007). "Effect of family planning services on modern contraceptive method continuation in Vietnam." Journal of Biosocial Science **39**(2): 201-220.
- Jain, A. (1999). "Should eliminating unmet need for contraception continue to be a program priority?" International Family Planning Perspectives **25 (suppl)**: S39-43, S49.
- Janowitz, B., T. Kane, et al. (1986). "Side effects and discontinuation of oral contraceptive use in southern Brazil." Journal of Biosocial Science **18**(3): 261-71.
- Khan, M. (2001). "Side effects and oral contraceptive discontinuation in rural Bangladesh." Contraception **64**(3): 161-167.
- Koenig, M., M. Hossain, et al. (1997). "The influence of quality of care upon contraceptive use in rural Bangladesh." Studies in Family Planning **28**(4): 278-289.
- León, F. R., S. Roca, et al. (2003). One-year client impacts of quality of care improvements achieved in Peru. FRONTIERS Final Report. Wasington, D.C., Population Council.
- Marston, C. and J. Cleland (2003). "Do unintended pregnancies carried to term lead to adverse outcomes for mother and child? An assesment in five developing countries." Population Studies (Camb) **57**(1): 77-93.
- Pariani, S., D. Heer, et al. (1991). "Does choice make a difference to contraceptive use? Evidence from east Java." Studies in Family Planning **22**(6): 384-390.
- RamaRao, S., M. Lacuesta, et al. (2003). "The link between quality of care and contraceptive use." International Family Planning Perspectives **29**(2): 76-83.
- Savabi-Esfahany, M., S. Fadaei, et al. (2006). "Use of combined oral contraceptives: retrospective study in Isfahan, Islamic Republic of Iran." Eastern Mediterranean Halth Journal **12**(3/4): 417-422.
- StataCorp. (2007). Stata Statistical Software: Release 10. College Station, TX, StataCorp LP.
- Steele, F., S. L. Curtis, et al. (1999). "The impact of family planning service provision on contraceptive dynamics in Morocco." Studies in Family Planning **30**(1): 28-42.
- Tolley, E., S. Loza, et al. (2005). "The impact of menstrual side effects on contraceptive discontinuation: Findings from a longitudianl study in Cairo, Egypt." International Family Planning Perspectives **31**(1): 15-23.

Vadnais, D., A. Kols, et al. (2006). Women's Lives and experiences: Changes in the past ten years. Calverton, MD, ORC Macro.

Zhang, F., A. Tsui, et al. (1999). The determinants of contraceptive discontinuation in Northern India: A multilevel analysis of calander data. Working Papers, MEASURE Evaluation.