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# 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. Data were collected from October 2006 to 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 12 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.

Effective contraceptive use implies that women correctly use a method of contraception to delay or avoid pregnancy until such time as they want another child or no longer need contraception. Premature discontinuation contributes to unmet need for family planning. Unmet need is represented by 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 et al. 2003). Unmet need can lead to unplanned pregnancy and unwanted births, which in turn may result in such negative public health consequences as increased maternal, neonatal and infant morbidity, and mortality (Marston and Cleland 2003; Conde-Agudelo et al. 2006; Barden-O'Fallon et al. 2008a).

Contraceptive discontinuation is common, occurring most often during the first 12 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 percent to 50 percent of users of reversible modern methods discontinued their method during the first 12 months of use (Vadnais et al. 2006). Often, discontinuation is due to reasons other than to become pregnant: Only 3 percent to 8 percent of users in the above analysis discontinued in order to become pregnant (Vadnais et al. 2006). Prior multi-country research found that discontinuation due to 'reduced need' (a broader category including the desire to become

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pregnant, infrequent sex, absence of husband/partner, menopause or subfecundity, and marital dissolution/separation) ranged between 7 percent and 20 percent of users of all reversible methods (Blanc et al. 2002). These findings indicate that the majority of contraceptive discontinuation is 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 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 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 are relatively small (Koenig et al. 1997; Steele et al. 1999; León et al. 2003; RamaRao et al. 2003; Do and Koenig 2007). Evidence is weak on whether counseling interventions can improve continuation of hormonal contraceptives (Halpern et al., 2006). Furthermore, the expected positive association between the number of methods available and contraceptive continuation has not been established (Steele 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 et al. 1986; Ali and Cleland 1995; Khan 2001; Savabi-Esfahany et al. 2006). In the summary report using DHS data for 18 countries referenced earlier, more than 20 percent of women who discontinued using contraception did so because of side effects (the percentage was less than 10 percent in only two of the sampled countries) (Vadnais 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 suggest that it is not just the physiological experience of side effects that influence women's decisions, but the specific type of side effect and how it is perceived by women, their partners, and the community (Cheung and Free 2004; Tolley et al. 2005; Alam et al. 2007). For example, prolonged or heavy menstrual bleeding is problematic in Bangladesh because menstruation is culturally taboo (Alam et al. 2007). Such findings suggest that the impact of side effects on daily life has important consequences for contraceptive use, though qualitative research may be needed to gain a deeper understanding of these issues.

It is notable that while there is a large body of research on factors related to contraceptive discontinuation, most of these studies focus on individual demographic characteristics, side

effects, and/or service quality and rarely include all factors together nor include other factors that influence discontinuation such as partner engagement. 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 services, experience of and reaction to side effects, and method characteristics) affect contraceptive discontinuation among users of reversible 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 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.

The study is the first of this topic to collect longitudinal data in Honduras, a country where little is known about contraceptive discontinuation as recent Demographic and Health Surveys (DHS) and Reproductive Health Surveys (RHS) have not collected the necessary data to calculate discontinuation rates. Modern contraceptive use is relatively high (56.4% of all married women ages 15–49) in the country, with female sterilization the most common modern method (21.2%), followed by the reversible methods of interest in this study; injectables (13.8%) oral contraceptive pills (11.3%) and the IUD (6.6%) (all references this section from [Honduras], (INE) et al. 2006). The main suppliers of modern family planning methods are almost equally split between the public and private sector, with the Secretary of Health system of hospitals, CESAMOs (Health Centers with Doctors and Dentists), and CESARs (Rural Health clinics, staffed by nurses) supplying contraception to 44% of users. The Honduran Family Planning Association (Asociación Hondureña de Planificación de Familia or ASHONPLAFA), the local International Planned Parenthood Federation affiliate, is the country's main private provider of family planning services, serving 25% of users. Of note, pharmacies are the most common source of supply for oral contraceptive pills (35.3%).

## 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 to 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 ASHONPLAFA clinics. As mentioned earlier, 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 who 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) during October and 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 through December 2007. A total of 671 women (84 percent) were found and interviewed at follow-up. The majority of the women who were lost to follow-up could not be located; only a small number of women refused to be interviewed (7) or had died (2).

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 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

For this analysis, discontinuation is defined as stopping the use of the current method. The transition to non-user status is assessed at the first episode (or month) of non-use of any method. 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, 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 two 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), one or two 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 discontinuation compared to all others.

At follow-up, women were asked about the number of side effects experienced (responses ranged from none to six, 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 were 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. These indicators are based on elements from the Bruce framework of quality of care that are best suited for assessment by exit interviews (Bruce 1990). The indicators of service quality included 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. Taken as one of a group of service quality indicators, the number of methods discussed may be useful. While discussion of four methods is not inherently better than discussing three methods, for example, discussing only one method may indicate that clients do not have the opportunity to explore the option of other methods and thus do not have full knowledge of the choices available. The variable is dichotomously categorized (0/1 vs. 2+) for the analysis. 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) 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.

**Descriptive Analysis—**The above information will give a snapshot view of discontinuations occurring during the 12-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 12 months of use are calculated only for the group of women who were initiating a method at baseline. Continuing users are not included in the life table analyses due to the biases (censoring and recall, for example) that would be introduced by including users that had already 'survived' to the day of the interview. 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 (or "episode") 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. Due to the way the dependent variables are constructed (discontinuation of baseline method and first episode of non-use) women do not reenter the analysis. As a result, there is censoring since we do not analyze what happens after the first month of non-use. It is possible that women reinitiate use or switch to another method in later months.

**Multivariate Model—**Cox proportional hazards models are performed on the full sample to assess simultaneously 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 relevant results within tables. 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 Shoenfeld 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 percent) 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 et al. 2008b). 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 percent) is under the age of 35. Most women have had at least some education (94 percent), with almost 30 percent having reached a secondary or higher level of education. Only 3 percent of the women did not have any children at baseline, while 83 percent had between one and three children. Being married or in union was common, 89 percent at baseline (at follow-up, 94 percent were in union). Approximately 23 percent of women who were interviewed in the city for the baseline clinic appointment currently resided 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 percent 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 percent 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 Speizer et al., 2009 for a more in depth discussion of ambivalence in this study population). At follow up, one-fifth of the women in this analysis reported that their husband wants more children than they do. The remaining women reported 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 reported discussing family planning with their partner three or more times in the last year. Another one-third of the women reported 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 also 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.[1] The remaining two-thirds of

[1]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 OşFallon and colleagues (Barden OşFallon et al., 2009).

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.

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 reported ever being told about side effects of family planning methods. Only about a third of women, however, reported that they were told about the advantages and disadvantages of the current method at the baseline appointment. Additionally, 43% of women reported 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 reported 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 percent). The IUD was being used by 21 percent of the sample while only 7 percent 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 12-month study period as 273 women (41 percent) discontinued their baseline method (see Table 2). As expected, discontinuation varied by method and was significantly higher among users of the pill (49 percent, or 44.4 percent discontinuing once plus 4.4 percent discontinuing twice) and injectable (a total of 44 percent), as compared to users of the IUD (a total of 28 percent) ($p=0.002$). In relation to the length of method use at baseline, discontinuation was indeed most frequent among new users (a total of 45 percent) as compared to those women who had been using for less than a year (a total of 39 percent) and those who had been using for more than a year (a total of 36 percent), however, this difference was only moderately significant at $p=0.095$. Among women who discontinued, method switching was also common: 118 women (43 percent) used another method of contraception during the study period, sometimes immediately following the discontinuation and other times after a period of non-use (switching results not shown in tables). Overall, method-switching occurred for almost one-fifth (18 percent) of the total study sample. A small percent of women who switched methods went on to discontinue again (4 percent). Switching occurred more often among new users (22 percent) and users of less than or equal to one year (19 percent) as compared to users of more than one year (10 percent). Method switching was almost equally frequent by baseline method (17 percent to 19 percent). Switching to another method included in the study accounted for 72% of switches, with the pill being the most common method switched to (37%), followed by injectables (21%) and the IUD (14%) (Barden-O'Fallon and Speizer 2010). Traditional methods (14%) and condoms (13%) were also used.

During the study period, 167 women (25 percent) experienced one month or more of non-use (non-use results not shown in tables). Some of the non-use was due to pregnancy: there were 47 pregnancies (7 percent of the sample) in the 12-month follow-up, 37 (79 percent) of which were among women who used the injectable at baseline. Of these pregnancies, 16 (34 percent) were reported as being wanted at the time of pregnancy, 22 (47 percent) were reported as being wanted at a later time, and nine (19 percent) were reported by women wanting no more children.

Discontinuation of the baseline method was most often due to problems with the method (65.6 percent), mainly from side effects (55.3 percent) and becoming pregnant while using the method (4.8 percent) (reasons for discontinuation not shown in tables). The second most common category of reasons to discontinue the baseline method was due to reduced need (28.6 percent): women in this category most often reported infrequent sex (9.5 percent) wanting to become pregnant (8.8 percent), or marital dissolution (8.8 percent). Finally, access to contraceptive methods also played a small role in discontinuation of the baseline method (4.8 percent): women with responses in this category most often reported missing appointments (1.5 percent) or a lack of time (1.1 percent). 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 percent) women starting a method at baseline are 0.23 at six months and 0.45 at 12 months (Table 3). This indicates that 23 percent of women initiating a method at baseline discontinued use of the method by six months of use, while 45 percent discontinued use of the method by 12 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 percent of women initiating a method at baseline experienced an episode of non-use by six months and 25 percent by one year (Table 4). The injectable had the highest rates of discontinuation at six and 12 months; a full 50 percent of women initiating the injectable at baseline discontinued its use by one year, and 30 percent 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. As noted previously, the models were stratified by method type. The standard errors are not shown in the table, but range between 0.56 and 3.09 in Model 1 and 0.52 and 3.80 in Model 2, suggesting that the small sample of pill users was not an issue, though perhaps resulted in slightly more conservative significance levels. 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

percent 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 percent 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 percent 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 four 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.

As has been found elsewhere, discontinuation of the IUD occurred less frequently than discontinuation of either the pill or injectable (Ali and Cleland 1999; Curtis and Blanc 1997). Curtis and Blanc (1997) note that method characteristics influence discontinuation rates both directly, by influencing the risk of discontinuation, and indirectly, by influencing

the choice of method. In other words, while discontinuation of the IUD requires a "proactive decision" for removal (unlike pills or the injectable), women who are more likely to discontinue may be less likely to choose the longer acting method in the first place. The study results also suggest that many women were able to switch successfully 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. Further investigation into what happens after discontinuation would be illuminating. Such research could characterize successful method switchers in relation to all-method discontinuers, especially among women discontinuing due to side effects. Another potential line of research is to evaluate the impact of supply and access on the likelihood of method switching.

The simultaneous examination of multiple factors associated with contraceptive discontinuation has shown demographic characteristics, fertility motivations, and the experience of side effects are significantly associated with an increased likelihood of method discontinuation. This is in line with previous studies of discontinuation. However, when successful method switching was considered, fewer variables in these dimensions were significant. Most indicators of service quality had little effect on discontinuation over the course of the study. This too, is in line with previous research, but may also be an artifact of the way in which service quality was measured in this study (at a single point in time). Imperfect measurement of service quality may also explain why side effects are associated with an increased likelihood of discontinuation despite the fact that over 60% of women had previously been informed about side effects by a health care provider. Alternately, it may also be true that counseling on side effects has little effect on discontinuation when experiencing side effects, as there are other social and personal influences that are not easily measured. 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 an environment of high method discontinuation, results suggest that programs focus efforts on maintaining contraceptive coverage and ensuring that women know about and have access to available options if they choose to discontinue.

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. The media can serve as a catalyst that will encourage greater couple communication on family planning use and experiences.

This manuscript presents results for a unique study in which longitudinal data were collected for the first time in Honduras to better understand the effects of various factors on contraceptive discontinuation. Often, discontinuation is assessed from cross-sectional data, such as those collected by contraceptive calendars in the DHS and RHS. In Honduras, such data was previously unavailable. Moreover, cause and effect are not able to be established with the cross-sectional design and recall bias can be a real concern, as women are asked to report contraceptive use retrospectively for the 5 years preceding the interview. The study also provides a rich source from which to examine the multiple influences on discontinuation, as we were able to add questions of interest unavailable in a standard DHS or RHS. However, there are some important limitations to the study that 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. We do not know the extent to which courtesy bias may have affected the reporting of quality of care measures at the baseline exit interview; though we note that the indicators used for this analysis show a substantial proportion of women (sometimes over 50%) responding in the negative. Likewise, at follow-up, it is possible that difficulty recalling the timing of events during the previous year may have biased reporting of discontinuation. We also do not know how the client base or services may vary in ASHONPLAFA and health ministry 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 these data and thus the data cannot be taken to be representative of urban Honduras in general. Finally, the women who could not be found for re-interview may have had different contraceptive continuation experiences than the women included in the follow-up interview; the women lost to follow-up were similar in baseline characteristics to the women found, so this is not expected to be a large source of bias.

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 discontinuing due to side effects and may need greater support for continued contraceptive use. Programs that provide comprehensive services, including counseling on side effects and approaches to switching methods, could improve continuation and lead to a reduction of unintended pregnancies and improved maternal and child health outcomes in Honduras and elsewhere where contraceptive discontinuation is common.

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## Table 1

Characteristics of study population, Honduras, 2006–2007; N=671

| Demographic Characteristics | % |
|---|---|
| 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 |
| **Fertility Motivations and Partner Engagement** | |
| 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 |
| **Experience with Side Effects** | |
| Number of side effects experienced* | |
| 0 | 32.9 |
| 1 | 27.0 |
| 2 | 22.8 |
| 3+ | 17.3 |

| Demographic Characteristics | % |
|---|---|
| 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 |
| **Service Quality** | |
| 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 about side effects of method† | 61.6 |
| **Method Characteristics** | |
| 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.

†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 three times during the 12 months.

**Table 3**

Discontinuation rate of baseline method at six and 12 months after initiation among new users, by baseline method, N=324

| | Discontinuation Rate of Baseline Method | |
|---|---|---|
| **Baseline Method** | **@ 6 months** | **@ 12 months** |
| 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 12 months after initiation among new users, by baseline method, N=324

| | Transition to First Episode of Non-Use | |
|---|---|---|
| **Baseline Method** | **@ 6 months** | **@ 12 months** |
| 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 |
|---|---|---|
| **Demographic Characteristics** | | |
| 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† (FU) | 1.97*** | 2.27*** |
| Urban residence (REF: Rural residence) (FU) | 0.94 | 0.74* |
| **Fertility Motivation and Partner Engagement** | | |
| 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* |
| **Experience of Side Effects (Assessed at Follow-up)** | | |
| 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 |
| **Service Quality (Assessed at Baseline)** | | |
| 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 |
| **Method Characteristics** | | |
| 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

*** p<0.01;

** p<0.05,

* $p<0.1$

† Reference categories are the null unless otherwise stated.