Contraceptive Discontinuation among Honduran Women Who Use Reversible Methods

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A panel study examining the effects of women's individual characteristics, side effects experienced, and service quality on their contraceptive discontinuation was undertaken in four urban areas of Honduras. Data were collected from October 2006 to December 2007. The baseline sample consisted of 800 women aged 15–44 who were new or continuing users of an injectable contraceptive, the IUD, or an oral contraceptive. A total of 671 women (84 percent) were reinterviewed after one year. Life tables and Cox proportional hazards models were 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 percent), especially for users of an injectable method (50 percent). In the hazards model, service quality had little effect on discontinuation, whereas 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. (Studies in Family Planning 2011; 42[1]: 11–20)

Effective contraceptive use implies that women use a method of contraception correctly to delay or avoid pregnancy until such time as they want to have a child or no longer need contraception. Premature discontinuation of contraception contributes to unmet need for family planning. Unmet need occurs when women who no longer want to become pregnant or who want to delay a pregnancy 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. 2008b).

Contraceptive discontinuation is common, occurring most often during the first 12 months after a method's adoption. Levels of discontinuation vary according to country. A recent summary of data from 18 Demographic and Health Surveys 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 occurs for reasons other than the desire to become pregnant: only 3 percent to 8 percent of users in the analysis mentioned above discontinued in order to become pregnant (Vadnais et al. 2006). Prior multicountry research found that discontinuation due to "reduced need" (a broader category that includes the desire to become 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 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 on the fertility motivations of users, the quality of family planning services, the family planning service environment, and the experience of methods' side effects. Results from this research demonstrate that women who are younger, of higher parity, or unmarried or not in union are the most likely to discontinue a method (Ali and Cleland 1995; Curtis and Blanc 1997). Other demo-

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graphic 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 characteristics of the woman such as the level of motivation to avoid becoming pregnant, self-efficacy, and autonomy are also considered to be directly related to contraceptive discontinuation (Blanc 2001). Partners' involvement in contraceptive discontinuation is not yet well understood, although it 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. Many studies have failed to identify statistically significant associations between the service environment and discontinuation, and others have found that when significant effects can be observed, the size and programmatic significance of the effects 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 concerning whether counseling interventions can improve continuation of hormonal contraceptives (Halpern et al. 2006). Moreover, 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 considers the impact of methods' physical side effects on discontinuation. Side effects are one of the reasons most often cited 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 mentioned above using DHS data for 18 countries, more than 20 percent of women who discontinued practicing contraception did so as a consequence of side effects (the proportion was less than 10 percent in only two of the sampled countries) (Vadnais et al. 2006). Whether supplying women with more information or better counseling on side effects will improve their contraceptive continuation if, in fact, they experience side effects is unclear. Moreover, the reasons are not clear why, after experiencing side effects, some women discontinue use altogether, others switch methods, and still others continue using the same method. Some researchers suggest that women's decisions are influenced not only by the physiological experience of side effects but also by the specific type of side effect they experience and how it is perceived by the women, by their partners, and by their 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, although qualitative research may be required in order to gain a deeper understanding of these issues.

Although a large body of research has been published about factors related to contraceptive discontinuation, most of these studies focus on individual demographic characteristics, side effects, and/or service quality; rarely do such studies include all factors together or other factors that influence discontinuation such as partners' attitudes. The overall goal of this study is to determine how multiple factors—including demographic characteristics, fertility motivations, partners' 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. Although many of these factors have been shown to be important individually 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 the method used. This study, therefore, goes beyond previous research by assessing the relative influence of these different dimensions on contraceptive continuation and by making programmatic recommendations for improved contraceptive use and reduced unmet need for family planning based on these findings.

This study is the first on this topic to collect longitudinal data in Honduras, a country where little is known about contraceptive discontinuation. Demographic and Health Surveys (DHSs) and Reproductive Health Surveys (RHSs) have not collected recent data for calculating discontinuation rates for Honduras. Modern contraceptive use is relatively high in the country (56 percent of all married women aged 15–49 use a modern method). Female sterilization is the most common modern method used (21 percent), followed by the reversible methods of interest in this study: injectables (14 percent), contraceptive pills (11 percent), and the IUD (7 percent) (all data in this section are from Secretaria de Salud et al. 2006). The main suppliers of modern family planning methods are almost equally split between the public and private sector. The Secretary of Health system of hospitals, CESAMOs (Secretary of Health clinics with doctors and dentists), and CESARs (rural health clinics staffed by nurses) supply contraceptives to 44 percent of users. The Honduran Family Planning Association (Asociación Hondureña de Planificación de Familia, or ASHONPLAFA), which is the local affiliate of the International Planned Parenthood Federation, is the country's main private provider of family planning services, supplying 25 percent of users. Notably, pharmacies are the principal source of supply for oral contraceptives (35 percent).

Methods

The data for this study are drawn from a panel study of women seeking family planning services in a clinic in one of four urban areas of Honduras: Tegucigalpa, San Pedro Sula, Santa Rosa de Copán/La Entrada, and Gracias. The objective of the study is to examine contraceptive continuation patterns among users of female reversible contraceptive methods (the pill, injectables, and the IUD). The data were collected in two rounds: a baseline interview and a follow-up interview 12 to 15 months later. The baseline data were collected during exit interviews held with eligible women attending a family planning appointment in selected health facilities at which they received a contraceptive injection, a course of oral contraceptives, or the IUD. Selected clinics for the study included seven Secretary of Health clinics (CESAMOs), one Secretary of Health hospital, and five ASHONPLAFA clinics. As mentioned above, these types of facilities provide most of the 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 reversible methods. No enrollment quotas were established 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 at least 12 months (and at most 15 months) later with the same women who had been 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 about demographic characteristics, birth history, previous use of contraceptives, perception of service quality at clinic appointment, motivation to avoid pregnancy, and the family planning decisionmaking environment. The follow-up questionnaire collected information about the use of contraceptives during each month since the baseline interview, as well as the women's experience of and reactions to their method's side effects. During the follow-up data collection, updates were obtained on demographics (for example, marital status and residence), fertility motivations, and the decisionmaking 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 women's ending use of their current contraceptive method. The transition to nonuser status is assessed at the first episode (or month) of nonuse of any method. Independent variables for the analysis are grouped as (a) demographic characteristics, (b) fertility motivations and partner/community engagement, (c) experience of side effects, (d) service quality, and (e) method's 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 children); 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. A variable for area of residence (urban versus rural) is, therefore, included. Because some women's marital status and place of residence may have changed between baseline and follow-up, and this change could be related to contraceptive continuation, the follow-up responses are used for this analysis.

Fertility motivations were assessed at baseline by asking women whether they want to have 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 partners' engagement, the frequency of the respondent's discussion of family planning with her partner during the previous 12 months was assessed at the follow-up interview and was coded as never (or no partner), one or two times, or more often. Each woman was also asked whether she felt that her partner wanted more, fewer, or the same number of children as she did. "Fewer," "same," and "don't know or not in union" responses were grouped for this analysis to permit an assessment of whether a partner's wanting more children is associated with contraceptive discontinuation.

At follow-up, women were asked about the number of contraceptive side effects they had experienced (responses ranged from none to six, and are coded as 0, 1, 2, and 3+). Women also were asked yes/no questions regarding whether they experienced specific side effects, including heavy bleeding, weight gain, dizziness, headaches, amenorrhea, or abdominal pain. Women were also asked whether the side effects interfered with their (1) daily life and/or (2) personal relationship with their 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 that all her questions had been answered; and whether information had been given about the method's 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. Although 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, therefore, do not have full knowledge of the choices available. The variable is dichotomously categorized (0/1 versus 2+) for the analysis. Moreover, women were asked whether they had ever, at this appointment or at any time previously, been informed by a health-care worker about the side effects of their method (yes/no). Other questions were asked about women's experiences at the clinic appointment; these included the client's level of satisfaction with the cleanliness of the clinic, its level of privacy, the way she was treated by the provider, and her overall satisfaction with the care she received. These questions, however, showed little variation (fewer than 10 percent responded in the negative) and are 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, using method for one year or less, and using method for more than one year) are also included in the analysis.

Descriptive Analysis

Descriptive statistics of the study population are presented for the variables presented above. Information is also provided concerning 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 information above offers 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 employed to provide information about the pace of discontinuation during the study. Discontinuation rates for the first 6 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 because of the biases (censoring and recall, for example) that would be introduced by including responses from women who had already "survived" as users 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 (that is, until the first month of nonuse of the baseline method). Life tables are also employed to determine the transition rates from user status to nonuser status (that is, use until the first month, or "episode," of nonuse of any method). This analysis takes into consideration the many women who discontinued their baseline method and switched to another method without missing one month of coverage. These rates are also presented by baseline method. As a result of the way in which the dependent variables are constructed (discontinuation of baseline method and first episode of nonuse), women do not reenter the analysis. Censoring occurs, therefore, because we do not analyze what happens after the first month of nonuse. Some women may reinitiate use or switch to another method in later months.

Multivariate Analysis

Cox proportional hazards models are employed for the full sample to assess simultaneously the association with the likelihood of method discontinuation of five categories of variables: individual characteristics, fertility motivation and partner's engagement, experience of side effects, service-quality indicators, and method characteristics. Separate models are run for (1) discontinuation of the baseline method and (2) first episode of nonuse 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 equals the odds that an event will occur when all covariates are set to zero; the event may occur sooner or later with the addition of covariates. A hazard ratio (HR) below 1.0 indicates that increases in the covariate reduce the hazard (the "risk" or "likelihood") that the event will occur, whereas an HR above 1.0 reflects an increase in the likelihood that the event will occur. 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, therefore, not calculated. Scaled Shoenfeld residuals are used to assess the assumption that HRs are proportionate over time for all covariates. Because of 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 software, version 10.1 (StataCorp. 2007).

Results

A total of 800 women who were using an effective female reversible method of family planning were enrolled at baseline, and 671 of these women (84 percent) were interviewed at follow-up. No significant differences were found between the women interviewed at follow-up and the full sample interviewed at baseline in terms of baseline characteristics (age, marital status, education, residence, or method use) (Barden-O'Fallon et al. 2008a). A profile of the 671 women interviewed at baseline and follow-up is presented in Table 1. The table shows that the study population was young; the vast majority (94 percent) were younger than 35 at baseline. Most women had at least some education (94 percent), and almost 30 percent attained a secondary or higher level of education. At baseline, only 3 percent of the women had no children, whereas 83 percent had between one and three children (not shown). Most were married or in union (94 percent at baseline, 89 percent at follow-up). Although all of the interviews at baseline were conducted in urban clinics, 23 percent of the women resided in a rural area. These rural women may have been in the city for other reasons as well—for example, for work or to go to market.

Table 1 indicates that 47 percent of the women in the panel sample wanted to space a future birth by two or more years at the time of the interview, and another 34 percent 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 have been ambivalent about practicing family planning (see Speizer et al. 2009 for an in-depth discussion of such ambivalence in this study population). At follow-up, one-fifth of the women surveyed reported that their husbands wanted more children than they did. The others reported that their husbands wanted fewer children, the same number, or that they didn't know their husbands' fertility desires. In this sample, discussion of family planning with partners was widespread. At the follow-up interview, nearly half of the women (47 percent) reported discussing family planning with their partners three or more times in the past year. Another one-third of the women reported that they and their partners discussed family planning one or two times in the past year.

Experience with a method's side effects, quality of services received, and methods' characteristics are also shown in the table. At the follow-up interview, one-third

Table 1 Percentage of women surveyed (n = 671), by selected demographic characteristics, fertility motivation and partner's engagement, experience of side effects, service quality, and method and length of use, Honduras, 2006–07

Characteristic	Percent
Demographic characteristic	
Age (BL)	
15–24	54.2
25–34	39.8
35–44	6.0
Education (BL)	
None	5.8
Primary	64.5
Secondary+	29.7
Number of children ever born (BL)	
0–1	44.1
2–3	42.2
4+	13.7
Marital status (FU)	
Married or in union	89.3
Not in union	10.7
Residence (FU)	
Urban	77.4
Rural	22.6
Fertility motivation and partner's engagement	
Desire for more children (BL)	
Have more children in less than two years	11.8
Have more children in two or more years or don't know when	47.4
Have no more children	34.4
Undecided	6.4
Discussed family planning with partner in last 12 months (FU)	
Never	20.7
1–2 times	32.5
More often	46.8
Feels partner wants (FU)	
More children than respondent does	20.3
Fewer children, the same number, or don't know	79.7
Experience of contraceptive side effects at follow-up	
Number of side effects experienced	
0	32.9
1	27.0
2	22.8
3+	17.3
Heavy bleeding	14.2
Weight gain	11.0
Dizziness	13.0
Headaches	26.7
Amenorrhea	22.1
Abdominal pain	14.8
Felt side effects interfered with daily life or personal relationships	34.4
Discussed health concerns or side effects with family and/or friends in recent months	44.7
Service quality at baseline	
Number of methods provider discussed	
0–1	67.5
2–6	32.5
Was told about benefits and disadvantages of method	35.6
Felt provider answered all questions	58.0
Was told how to use method effectively	42.8
Was ever informed by health-care provider about side effects of method[a]	61.6
Method and length of use at baseline	
Method used	
Injectable	72.4
IUD	20.9
Pill	6.7
Length of use at enrollment	
New user/new to method	48.3
≤ One year	20.3
One year+	31.5

BL = baseline. FU = follow-up. [a]This indicator alone refers to service prior to day of interview.

of respondents reported experiencing no side effects in the one-year follow-up period. (For a comprehensive examination using qualitative and quantitative data of the experience of side effects among respondents, see Barden-O'Fallon et al. 2009.) The remaining two-thirds experienced at least one or more side effects, with 17 percent reporting experience of three or more. The most common side effects reported were headaches and amenorrhea. One-third of all women surveyed reported that side effects interfered with their daily lives or personal relationships. (This proportion would be higher if women who had no side effects were not included in the denominator; among those who experienced side effects, 51 percent reported that they interfered with daily life or personal relationships.) Less than half of the women (45 percent) reported discussing side effects or health concerns with family members or friends in recent months.

At baseline, women were asked about their prior experiences with health-care providers and about their exposure to information concerning family planning methods. Table 1 shows that nearly two-thirds of the women (62 percent) reported ever having been told about the side effects of family planning methods. Only about a third of the women (36 percent), however, reported that they were told about the benefits and disadvantages of their current method at the baseline appointment. Additionally, 43 percent of women reported that they were told how to use their current method effectively, and 58 percent reported that the provider answered all of their questions. Only one-third of the women reported that their provider discussed at least two methods with them at their baseline appointment. Taken together, these variables indicate inadequate service quality provided to 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, whereas only 7 percent were taking the pill. Among users at baseline, nearly half (48 percent) were beginning the method on the day of the interview, either having never used the method before or readopting the method after a period of nonuse. 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. The new users would be expected to be the most likely to discontinue a method in the follow-up period, whereas the women who had been using a method for a longer period of time would be the most likely to continue using it over the one year follow-up period.

During the 12-month study period, 273 women (41 percent) discontinued their baseline method (see Table 2). As expected, discontinuation varied by method and was significantly higher ($p = 0.002$) among users of the pill (49 percent: 44 percent discontinuing once and 4 percent discontinuing twice) and injectables (44 percent), compared with users of the IUD (28 percent). In relation to the length of method use at baseline, discontinuation was indeed most frequent among new users (45 percent), compared with discontinuation among women who had been using for one year or less (39 percent) and those who had been using for more than a year (36 percent). This difference was not quite statistically significant, however ($p = 0.095$).

Table 2 Percentage of women discontinuing use of a reversible method during the 12-month study period, by method and length of use at baseline, Honduras, 2006–07

Characteristic	No discontinuation		One discontinuation		Two discontinuations[a]		Total	
Method**								
Injectables	56.4	(274)	39.9	(194)	3.7	(18)	100.0	(486)
Pill	51.1	(23)	44.4	(20)	4.4	(2)	100.0	(45)
IUD	72.1	(101)	23.6	(33)	4.3	(6)[b]	100.0	(140)
Length of use								
New user	55.3	(179)	38.6	(125)	6.2	(20)[b]	100.0	(324)
≤ 1 year of use	61.0	(83)	36.8	(50)	2.2	(3)	100.0	(136)
> 1 year of use	64.5	(136)	34.1	(72)	1.4	(3)	100.0	(211)
Total	59.3	(398)	36.8	(247)	3.9	(26)	100.0	(671)

**Differences across the three subcategories in the percentage of women discontinuing is significant at $p < 0.01$.
[a] First discontinuation is of baseline method, second is of another method.
[b] Includes one woman who discontinued three times during the 12 months.
Note: Number of observations (n) is presented in parentheses.

Among women who discontinued, method switching (not shown) was common: 118 women (43 percent) used another method of contraception during the study period, sometimes immediately following the discontinuation and sometimes after a period of nonuse. Overall, method-switching occurred for almost one-fifth (18 percent) of the total study sample. A small proportion of women who switched methods discontinued again (4 percent). Switching occurred more often among new users (22 percent) and among those who had been using a method for one year or less (19 percent), compared with 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 considered in the study accounted for 72 percent of switches, with the pill being the method most commonly chosen in switching (37 percent), followed by injectables (21 percent), and the IUD (14 percent) (Barden-O'Fallon and Speizer 2010). Traditional methods (14 percent) and condoms (13 percent) were also used by those who switched.

During the study period, 167 women (25 percent) experienced one month or more of nonuse (not shown). Some of the nonuse was due to pregnancy: 47 pregnancies (7 percent of the sample) occurred in the 12-month follow-up period, 37 (79 percent) of which were among women who used an injectable method at baseline. Of the 47 pregnancies, 16 (34 percent) were reported as being wanted at the time of pregnancy, 22 (47 percent) were re-

ported as being wanted at a later time, and 9 (19 percent) were reported by women who said they had wanted no more children.

Discontinuation of the baseline method was most often the result of problems with the method (66 percent), particularly with side effects (55 percent) and because pregnancy occurred during use (5 percent) (reasons for discontinuation not shown). The second most common category of reasons for discontinuing the baseline method was reduced need (29 percent). Women with responses in this category most often reported infrequent sex (10 percent), wanting to become pregnant (9 percent), or marital dissolution (9 percent). Finally, access to contraceptive methods also played a small role in discontinuation of the baseline method (5 percent); women with responses in this category most often reported missing appointments (2 percent) or a lack of time to obtain a method (1 percent). Based on these results, not enough variation in reasons for discontinuation was found to warrant calculating discontinuation rates by reason.

The overall discontinuation rates for the 324 women (48 percent) starting a method at baseline are 0.23 at six months and 0.45 at 12 months (see Table 3). These rates indicate that 23 percent of women initiating a method at baseline had discontinued use of the method six months later, whereas 45 percent discontinued use of the method by 12 months of use. Many of these women switched to another method during the study period, however. An examination of time until first episode of nonuse of any method shows that 12 percent of women initiating a method at baseline had experienced an episode of nonuse during the following six months and 25 percent had done so during the following year**.** Injectable contraceptives had the highest rates of discontinuation at 6 and 12 months; a full 50 percent of women initiating an injectable method at baseline discontinued its use by one year, and 30 percent of women initiating use of an injectable experienced an episode of nonuse by one year. Although the IUD had the lowest levels of discontinuation among the three methods, almost one-third of women initiating the IUD had discontinued use within the following year.

Table 3 Among women starting a new method at baseline (n = 324), rate of discontinuation of baseline method and rate of transition to first episode of nonuse of any method, assessed at 6 and 12 months after initiation, by baseline method, Honduras, 2006–07

Baseline method	Rate of discontinuation for baseline method at:		Rate of transition to first episode of nonuse at:	
	6 months	12 months	6 months	12 months
Injectable	0.25	0.50	0.14	0.30
IUD	0.16	0.31	0.07	0.12
Pill	0.22	0.44	0.06	0.28
Total	0.23	0.45	0.12	0.25

Many IUD users switched to other methods without experiencing an episode of nonuse, however.

Results of the use-survival analysis on the factors associated with discontinuation of the baseline method (Model 1) and experience of an episode of nonuse (Model 2) are shown in Table 4. As noted above, the models are 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 between 0.52 and 3.80 in Model 2, suggesting that the small size of the sample of pill users is not an issue of concern, although perhaps it resulted in slightly

Table 4 Cox proportional hazards model of time until discontinuation of baseline method (Model 1) and first episode of nonuse of any method (Model 2), by selected demographic characteristics, fertility motivation and partner's engagement, experience of side effects, baseline service quality, and length of use at baseline (n = 671), Honduras, 2006–07

Characteristic	Model 1	Model 2
Demographic characteristic		
Age (BL)		
15–24 (r)	1.00	1.00
25+	1.34*	1.21
Education (BL)		
None/primary (r)	1.00	1.00
Secondary+	1.03	0.88
Number of children ever born (BL)		
0 or 1	1.35*	0.92
2+ (r)	1.00	1.00
Not currently in union (FU)	1.97**	2.27**
Residence (FU)		
Urban	0.94	0.74
Rural (r)	1.00	1.00
Fertility motivation and partner's engagement		
Desires children ≤ 2 years (BL)	1.40	2.04**
Wants more children > 2 years, wants no more children, undecided (r) (BL)	1.00	1.00
Feels partner wants more children than she does (FU)	0.84	1.15
Discussed family planning with partner in past year (FU)		
Never	0.84	0.96
1–2 times (r)	1.00	1.00
More often	1.05	0.86
Experience of side effects at follow-up		
None (r)	1.00	1.00
Heavy bleeding	2.07**	1.94**
Weight gain	1.85**	1.24
Dizziness	1.56**	1.29
Headaches	0.94	0.96
Amenorrhea	1.17	1.32
Abdominal pain	1.20	0.97
Side effects interfered with daily life or personal relationships	1.79**	1.24
Discussed health concerns or side effects with family/friends in recent months	0.75*	0.75
Service quality at baseline		
Ever informed by health-care provider about side effects of method	1.24	1.24
Told how to use method effectively	1.11	1.03
Felt provider answered all her questions	0.98	0.76
Provider discussed two or more methods	1.09	1.07
Length of use at baseline		
New user	1.25	1.08
Already using method (r)	1.00	1.00

(r) = Reference category. BL = baseline. FU = follow-up.
*Significant at $p < 0.05$; **$p < 0.01$.
Notes: Models 1 and 2 are stratified by baseline method type.

more conservative significance levels. All coefficients in Model 2, as well as in the global model, pass the assumption of proportionality. Model 1 passes the global test of proportionality; however, the variable for weight gain in Model 1 does not, suggesting that the estimate of its coefficient is inflated over time. Graphs of the Cox-Snell residuals show that the fit of the data to the Cox regression models is satisfactory (not shown).

Table 4 demonstrates that being older than 25, having one child or none, and not being currently in union were significantly associated with an increased likelihood of method discontinuation. Only union status was associated with an increased likelihood of experiencing an episode of nonuse, however. Living in an urban area, although not significantly related to method discontinuation, was close to being significantly related to a 26 percent reduction in the likelihood of experiencing an episode of nonuse ($p = 0.095$).

Baseline fertility desire was significantly associated with the likelihood of discontinuation of all methods (that is, nonuse), and was near to being significantly associated with discontinuation of the baseline method ($p = 0.058$). The risk of experiencing an episode of nonuse among women desiring another child within two years was double that of women wanting to delay or avoid a birth. Although variables reflecting partner's 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 was shown to be significant in Model 1, associated with a 25 percent reduction in the likelihood of discontinuation.

Respondents' discontinuation of the baseline method was associated with their experience of heavy bleeding, weight gain, and dizziness while using a method. In contrast, an episode of nonuse was significantly associated only with heavy bleeding. This finding merits further investigation. Furthermore, although women were more likely to discontinue their baseline method if they felt that side effects interfered with their daily life or personal relationships, the experience did not seem to dissuade women from switching to another method, because the variable was not statistically associated with an episode of nonuse.

In this study, service-quality indicators showed little association with contraceptive discontinuation or nonuse. Of the four measures included in the regression models, the only moderately related variable was whether women felt that the provider had answered all of their 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 nonuse, compared with women who did not feel this way ($p = 0.090$). Finally, women who were new users of a method at baseline were not significantly more or less likely than women who were already using their method at baseline to discontinue or experience an episode of nonuse.

Conclusion

Discontinuation of the baseline contraceptive method was high for this study population: more than four in ten women discontinued the use of their baseline reversible method during the 12-month follow-up 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 that include new family planning users, method switchers, readopters, and continuing users. Although new users were found to cease use of their method more often than continuing users, the continuing users were almost as likely to stop using their method, even among women who had been using one method for more than a year at baseline. In Honduras, the most commonly used method of contraception is female sterilization; more than one-fifth of all currently married women aged 15–49 are sterilized (Secretaria de Salud et al. 2006). This finding 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, so long as women who want to delay or limit childbearing are able to adopt an alternate method. Providers must, therefore, be prepared for contraceptive discontinuation, ensuring that a full array of methods is available (even when one method is widely popular), and that women are encouraged to return to the 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 an injectable method (Curtis and Blanc 1997; Ali and Cleland 1999). Curtis and Blanc 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, although discontinuation of the IUD requires a "proactive decision" for removal (unlike pills or injectables), 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 experiencing side effects. 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 as a consequence of experiencing side ef-

fects. 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 shows that demographic characteristics and the experience of side effects are significantly associated with an increased likelihood of method discontinuation. These findings are in accord with those of previous studies of discontinuation. When successful method switching is considered, however, fewer variables in these categories are found to be significant. Most indicators of service quality had little effect on discontinuation over the course of the study. This result, too, is in line with previous research, but it also may be an artifact of the way in which service quality was measured for 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 more than 60 percent of women having been informed about side effects by a health-care provider before they adopted a method. Alternatively, counseling about side effects may have little effect on discontinuation when side effects are experienced, because other social and personal influences that are not easily measured come into play. Overall, in an environment of high method discontinuation, results suggest that programs focus their 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 practicing contraception, which indicates the importance of social support for contraceptive use. Family planning programs are advised to build on these sources of support by disseminating new and accurate information widely, thereby keeping family planning issues in the public's awareness. The media can serve as a catalyst to encourage greater communication between wives and husbands about family planning practice and experiences.

For this study, longitudinal data concerning use of reversible female contraceptive methods were collected for the first time in Honduras in order to better understand the effects of various factors on method discontinuation. Often, discontinuation is assessed from cross-sectional data, such as those collected by contraceptive calendars for the DHS and RHS. In Honduras, such data were unavailable prior to this study. Moreover, cause and effect cannot be established from a cross-sectional calendar design, and recall bias can be a serious concern because women are asked to report contraceptive use retrospectively for the five years preceding the interview. This study also provides a rich source from which to examine multiple influences on discontinuation; we were able to add questions of interest that are not included in the standard DHS or RHS instruments. Some important limitations to the study merit attention, however. The study population is comprised of women attending ASHONPLAFA and Ministry of Health clinics, which are the main sources of modern contraceptives in Honduras. How contraceptive use in this population differs from that of women attending other types of service providers, such as social security hospitals, private clinics, pharmacies (where pills can be obtained), and community dispensaries, is not known.

We also do not know the extent to which courtesy bias may have affected the reporting of quality-of-care measures at the baseline exit interview, although we note that the indicators used for this analysis show a substantial proportion of women (sometimes more than 50 percent) responding in the negative. Likewise, at follow-up, respondents' difficulty in recalling the timing of events during the previous year may have biased their reporting of discontinuation. Moreover, we do not know how the client base or services may vary in ASHONPLAFA and health ministry facilities that did not participate in the study. The investigators intended for the results to 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; therefore, the data cannot be taken to be representative of urban Honduras in general. Finally, the women who could not be found for reinterview may have had different contraceptive-continuation experiences than those of the women included in the follow-up interview. The women lost to follow-up were similar in baseline characteristics to the women retained in the sample, so their loss is not expected to be a large source of bias.

This study demonstrates that although discontinuation commonly occurs among users of reversible female methods of contraception, a certain amount of this discontinuation is to be expected, because women who want to space a birth are the most likely to use the methods under consideration. Nevertheless, some women discontinue use because of methods' side effects and may need greater support for continuing to practice contraception. Programs that provide comprehensive services, including counseling concerning methods' 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 occurs frequently.

References

Alam, Mahboob-E., Jan Bradley, and Fatima Shabnam. 2007. "IUD use and discontinuation in Bangladesh." *E&R Study* No. 8. New York: Engender Health/The ACQUIRE Project.

Ali, Mohamed and John Cleland. 1995. "Contraceptive discontinuation in six developing countries: A cause-specific analysis." *International Family Planning Perspectives* 64(3): 92–97.

———. 1999. "Determinants of contraceptive discontinuation in six developing countries." *Journal of Biosocial Science* 31(3): 343–360.

Barden-O'Fallon, Janine L. and Ilene S. Speizer. 2010. "What differentiates method switchers from discontinuers? An examination of characteristics between women who switched contraceptive methods and women who discontinued all methods." Presented at the annual meeting of the American Public Health Association, Denver, 6–10 November.

Barden-O'Fallon, Janine L., Ilene S. Speizer, Sadith Cáceres, Javier Cálix, and Francisco Rodriguez. 2008a. *Contraceptive Discontinuation: A One-year Follow-up Study of Female Reversible Method Users in Urban Honduras*. Chapel Hill, NC: MEASURE Evaluation and Tegucigalpa, Honduras: PRODIM.

Barden-O'Fallon, Janine L., Ilene S. Speizer, Francisco Rodriguez , and Javier Cálix. 2009. "Experience with side effects among users of injectables, the IUD, and oral contraceptive pills in four urban areas of Honduras." *Health Care for Women International* 30(6): 475–483.

Barden-O'Fallon, Janine L., Ilene S. Speizer, and Justin White. 2008b. "The association between contraceptive discontinuation and pregnancy intentions in Guatemala." *Revista Panamericana de Salud Publica* 23(6): 410–417.

Blanc, Ann K. 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, Ann K., Siân L. Curtis, and Trevor N. Croft. 2002. "Monitoring contraceptive continuation: Links to fertility outcomes and quality of care." *Studies in Family Planning* 33(2): 127–140.

Bruce, Judith. 1990. "Fundamental elements of the quality of care: A simple framework." *Studies in Family Planning* 21(2): 61–91.

Casterline, John B., Fatima El-Zanaty, and Laila O. El-Zeini. 2003. "Unmet need and unintended fertility: Longitudinal evidence from Upper Egypt." *International Family Planning Perspectives* 29(4): 158–166.

Cheung, Eileen and Caroline Free. 2004. "Factors influencing young women's decision making regarding hormonal contraceptives: A qualitative study." *Contraception* 71(6): 426–431.

Conde-Agudelo, Augustin, Anyeli Rosas-Bermúdez, and Ana Cecilia Kafury-Goeta. 2006. "Birth spacing and risk of adverse perinatal outcomes: A meta-analysis." *Journal of the American Medical Association* 295(15): 1,809–1,823.

Curtis, Siân L. and Ann K. Blanc. 1997. "Determinants of contraceptive failure, switching, and discontinuation: An analysis of DHS contraceptive histories." *DHS Analytical Report* No. 6. Calverton, MD: Macro International.

Do, Mai P. and Michael A. Koenig. 2007. "Effect of family planning services on modern contraceptive method continuation in Vietnam." *Journal of Biosocial Science* 39(2): 201–220.

Halpern, Vera, David A. Grimes, Laureen M. Lopez, and Maria F. Gallo. 2006. "Strategies to improve adherence and acceptability of hormonal methods of contraception." *Cochrane Database of Systematic Reviews* 1: CD004317.

Jain, Anrudh. 1999. "Should eliminating unmet need for contraception continue to be a program priority?" *International Family Planning Perspectives* 25(Supplement): S39–43, S49.

Janowitz, Barbara, Thomas T. Kane, Jose Maria Arruda, Deborah L. Covington, and Leo Morris. 1986. "Side effects and discontinuation of oral contraceptive use in southern Brazil." *Journal of Biosocial Science* 18(3): 261–271.

Khan, M. Asaduzzaman. 2001. "Side effects and oral contraceptive discontinuation in rural Bangladesh." *Contraception* 64(3): 161–167.

Koenig, Michael A., Mian B. Hossain, and Maxine Whittaker. 1997. "The influence of quality of care upon contraceptive use in rural Bangladesh." *Studies in Family Planning* 28(4): 278–289.

León, Federico R., Santiago Roca, Alex Ríos, Adriana Zumarán, and Ana Rosa Feijoo. 2003. "One-year client impacts of quality of care improvements achieved in Peru." *FRONTIERS Final Report*. Washington, DC: Population Council.

Marston, Cicely and John Cleland. 2003. "Do unintended pregnancies carried to term lead to adverse outcomes for mother and child? An assessment in five developing countries." *Population Studies* 57(1): 77–93.

Pariani, Siti, David M. Heer, and Maurice D. Van Arsdol Jr. 1991. "Does choice make a difference to contraceptive use? Evidence from East Java." *Studies in Family Planning* 22(6): 384–390.

RamaRao, Saumya, Marlina Lacuesta, Marilou Costello, Blesilda Pangolibay, and Heidi Jones. 2003. "The link between quality of care and contraceptive use." *International Family Planning Perspectives* 29(2): 76–83.

Savabi-Esfahany, M., S. Fadaei, and A. Yousefy. 2006. "Use of combined oral contraceptives: Retrospective study in Isfahan, Islamic Republic of Iran." *Eastern Mediterranean Health Journal* 12(3–4): 417–422

Secretaría de Salud (SS) [Honduras], Instituto Nacional de Estadística (INE), and Macro International. 2006. *Encuesta Nacional de Salud y Demografía 2005–2006*. Tegucigalpa, Honduras: SS, INE, and Macro International.

Speizer, Ilene S., Laili Irani, Janine L. Barden-O'Fallon, and Jessica Levy. 2009. "Inconsistent fertility motivations and contraceptive use behaviors among women in Honduras." *Reproductive Health* 6:19. <http://www.reproductive-health-journal.com/content/6/1/19>. Accessed 1 December 2010.

StataCorp. 2007. *Stata Statistical Software: Release 10*. College Station, TX: StataCorp LP.

Steele, Fiona, Siân L. Curtis, and Minja Choe. 1999. "The impact of family planning service provision on contraceptive dynamics in Morocco." *Studies in Family Planning* 30(1): 28–42.

Tolley, Elizabeth, Sarah Loza, Laila Kafafi, and Stirling Cummings. 2005. "The impact of menstrual side effects on contraceptive discontinuation: Findings from a longitudinal study in Cairo, Egypt." *International Family Planning Perspectives* 31(1): 15–23.

Vadnais, Daniel, Adrienne Kols, Noureddine Abderrahim. 2006. "Women's lives and experiences: Changes in the past ten years." Calverton, MD: ORC Macro.

Zhang, Fengyu, Amy O. Tsui, and C.M. Suchindran. 1999. "The determinants of contraceptive discontinuation in northern India: A multilevel analysis of calendar data." *MEASURE Evaluation Working Paper* No. WP-99–15. Chapel Hill: MEASURE Evaluation.

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