INFLUENCES OF SELECTED PROGRAMMATIC FACTORS ON MODERN CONTRACEPTIVE DISCONTINUATION IN VIETNAM

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Introduction

The Vietnamese family planning program has been in place since the early 1960s. Starting 1972, the program used to heavily promote the use of IUD and menstrual regulation (Haughton, 1997). In the 1980s and 1990s, "late marriage, late child-bearing and two children" was promoted by the government. The government-led program has now shifted to largely a voluntary adoption of the contraceptives and the decision on the number of children. With sizable investment in this program, contraceptive prevalence has increased in recent years, contributing to the steady decline of total fertility (GSO, 1995; Haub and Huong, 2003; Haughton, 1997; The Population and Family Planning Project, 1999). The TFR dropped from 4.0 (1980) to 2.37 (2002) (Thang et al., 1998; The Population and Family Planning Project, 2003), at an unprecedented speed for a low income country. However, there is also evidence of high rates of contraceptive discontinuation within the Vietnamese program. It may be the explanation to the paradox in Vietnam where, high CPR and high abortion rate co-exist. By one year after adoption, one in four condom users and 40 percent of all oral pill users have discontinued use, and a smaller but significant percentage of IUD users (more than 10 percent) also discontinue use (GSO,1996)

While Vietnamese policy makers have expressed concern over the persistently high level of contraceptive discontinuation and unwanted pregnancy among Vietnamese women, little empirical evidence exists on the linkages between family planning services and modern contraceptive adoption and use (Thang and Anh, 2002). This study attempted to examine the linkages between family planning programs and contraceptive continuation. The specific objective of this paper is to examine influences of selected programmatic factors on temporary, modern contraceptive continuation. This is the first step towards more detailed analyses on the linkages between family planning programs and modern contraceptive use dynamics.

Data and Methods

Data collected with the Individual Questionnaire and the Community/Health Facility Questionnaire in the 1997 Vietnam DHS will be used for this study. One of the sections in the Individual Questionnaire of the 1997 VNDHS was devoted to contraceptive knowledge and use. The questionnaire includes a calendar to collect information about recent events in the respondent's reproductive life. Only those events that occurred in the five calendar years prior to the survey are captured (i.e. since January 1992). The calendar consists of 72 boxes (each box represents a month) on the vertical axis and 4 columns on the horizontal axis. These columns are used to record pregnancies, live births, terminations of pregnancies, and monthly contraceptive status (column 1), reasons for discontinuation of contraception (column 2), monthly marital status (column3) and place of residence and migration (column 4). This calendar section provides data for estimating the cumulative (dis)continuation rates of contraception within the five-year period, as well as a linkage to all pregnancies (including ones that resulted in live births, spontaneous or induced abortions, and current pregnancies) within the five-year period prior to the survey.

The sample of 5,664 ever-married women of the 1997 Vietnam DHS provides a sub-sample of 4,653 women who were ever users of all modern contraception (permanent and

temporary). Because the explanatory variables were measured at the time of interview, the analysis is further limited to only 3 years preceding the survey, allowing a reasonable assumption that such measures remained relatively constant during that period of time. Therefore, the sample is limited to segments of contraceptive use that started within the three-year duration. There were 1,868 women who meet the criteria. Many women either did not use any method of contraception in those three years, or had been using a method at the beginning of the interval (left truncation), or adopted a permanent method, and thus, were removed from the analysis. Exploratory analysis showed that this subsample is significantly comparable with the whole sample of the Vietnam 1997 DHS in terms of contraceptive use and basic socio-demographic characteristics (results not shown). At the time of the survey, about 55 percent of them were using a modern contraceptive, with 4 percent were using a permanent method and IUD was dominant with 39 percent of women using it.

Selection of episodes

A segment (or episode) of contraceptive use is defined as the time from when a woman accepts a new method of contraception until she stops using that method continuously for any reason. Like any other event history data, contraceptive history data collected with the calendar approach contain full episodes[1], as well as right-censored[2] and left-truncated episodes[3]. Because the risks of discontinuation typically vary with duration of contraceptive use, it is difficult to control for duration of use in left-truncated observations and several observers have argued that they should be excluded from the analysis (Steele et al., 1996). This may be a methodological concern, although according to Allison (1982, 1984), Curtis (1997) and Steele et al. (1999), the exclusion of left-truncated observations did not significantly bias the estimates in their studies. Therefore, this analysis proposes to exclude the left-truncated observations and include only observations where contraceptive use started within the 3-year period. In addition, the three months immediately before the survey are excluded to allow for under-reporting of first trimester pregnancies at the time of the survey, which can bias estimates of contraceptive discontinuation due to failures.

Conceptual framework

Figure 1 comes here

The conceptual framework for contraceptive use dynamics is depicted in Figure 1 and our paper is focused on the continuity component of the dynamics.

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[1] The contraceptive use starts and ends during the period of observation, so that the full duration of the episode is known.
[2] Right-censored episodes are those where contraceptive use starts in the period of observation but still continues at the end of the observation period, and thus the when the episode ends is not known.
[3] Left-truncated episodes are those where contraceptive use begins before the start of the observation period and continues through or terminates before the end of the observation period. The starting point of such episodes is not known.

Jain (1989) argues that quality of family planning services is an important determinant of contraceptive adoption and the range of methods available in the facility has significant influence on its continuation. Mensch and her colleagues (1996) found significant effect of service quality on contraceptive use in Peru. Equipment in local facilities has a positive effect on the use of modern contraceptive methods in Morocco (Hotchkiss, 1995a, Magnani, 1999). Steel (1999) has shown strong service effects on discontinuation. Nearest public clinic also emerged as statistically significant (Ilenes, 2000).

At community level, accessibility of family planning services also has an effect on contraceptive continuation. Increased travel time (31-60 minutes; greater than 5 kilometers away) appears to contribute to contraceptive discontinuation (Steele, Curtis, & Choe, 1999; Zhang, Tsui, & Suchindran, 1999).

Discontinuation rates also vary by specific method. Discontinuation rates for the IUD are the lowest of modern methods and hormonal methods (the pill, injectables) are most likely to be discontinued due to side effects or other health-related concerns (Ali, 1995). Mari (1998) showed that if health functionaries were reported as instrumental in motivating the Indian women to accept the method, odds of discontinuation is higher in the first 3 months than those who reported self or others as motivator. He emphasized that if IUD was accepted as spacing rather than limiting purposes, odds of continuation is higher after first 3 months and also among those who used IUD earlier odds of discontinuation are lower than who never used any method.

In this paper, programmatic factors include two components: outreach program and health clinic services.

Outreach programs play an important role in providing contraceptives to the women in the communities in Vietnam. Family planning field workers implement home visits to motivate and provide information to potential clients and contraceptive methods – generally oral pills and condoms - to adopters. Meanwhile, mobile family planning teams do not do home visits and provide more clinical methods such as IUDs and sterilization.

Access to outreach programs is measured by the frequency of visits of family planning workers' and mobile teams to the community. This information was obtained from key informant interviews. Quality of such programs and its influences on discontinuation will be explored in further analyses.

Health clinics in this study refer to any commune health centers or any other types of the government health centers in catchment area of the PSUs. Quality of the health clinics is measured by whether a clinic has at least one staff who received training in family planning in the last three years, and basic medical equipment available at the health clinic.

At the individual level, characteristics such as age at the time of contraceptive adoption of the index episode, religion, ethnicity, educational level and employment status are included. Community factors include urban/rural, distances to the nearest public transportation and the nearest market.

Statistical method

Since the analysis examines durations that lead to an event (i.e. discontinuation of contraceptive use), with possibilities of censoring, an appropriate approach is to use hazard models to estimate the impacts of various factors on the hazard, or the risk of having the events of interest. However, our tests showed that the proportional hazard assumption did not hold with most of the independent variables.

In addition, the discrete-time approach will be particularly appropriate for the analyses, instead of the continuous-time approach, for two main reasons (Alyson, 1984; Yamaguchi, 1991). First, although contraceptive use/non-use operates in continuous time, the duration of each interval is recorded to the nearest whole month; thus it is more natural to assume a model that reflects discrete time measurements. Second, because data were recorded to the whole month, they are likely to contain a number of ties, in which two or more individuals experience an event in the same month, which may lead to serious biases if partial likelihood estimation methodologies were used (Kalbfleish and Prentice, 1980; Sinha et al., 1994; Steele et al., 1996). Another advantage of the discrete-time approach is that it is more straightforward to incorporate time-varying covariates in the model. With such discrete time intervals, the hazard is the probability that an event of interest will occur during a particular time interval to a particular individual, given that the individual at risk at that time.

The nature of the data set is that the data were collected at both the individual and community levels. In addition, contraceptive use/discontinuation are repeated events in the 3-year interval – that is, a woman could experience more than one discontinuation – they are nested at the individual level. The women, in turn, are nested in their communities and may be influenced by the community characteristics. The women in the same communities, thus, are not really independent. This results in data coming from three different levels and thus, calls for the use of multilevel analysis (Goldstein, 1995).

Models were fitted and estimated for specific methods (pills, condoms and IUDs) and for specific reasons for discontinuation (i.e. method failure and method related reason) separately.

Findings

Table 1 presents the distribution of 2,184 segments of contraceptive use contributed by the subsample of 1,868 women who adopted a method of contraception within three years before the survey. Among modern contraceptive methods, IUD was dominant with more than 40 percent of all segments. It was followed by condom and oral pill use – these three methods accounted for nearly two-thirds of all segments of contraceptive use during the three-year period. A significant proportion of all segments was of traditional method use. Since the focus of this paper is continuation of reversible, modern contraceptive use, further analysis will be based on IUD, condom and oral pill use.

Table 1 comes here

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The subsample includes 1,226 women who adopted at least one of the three modern methods under study, i.e. IUDs, condoms and oral pills, within the three years preceding the survey. The vast majority of them contributed only one segment of contraceptive use during that interval. Therefore, for the purpose of this paper, we assumed that there would be no clustering at the woman level. Women are still nested in the communities, so a two-level model would be applied.

Table 2 comes here

Cumulative 12-month discontinuation rates by method and reason for discontinuation were reported in Table 3. Overall and reason-specific discontinuation rates varied considerably by method. The lowest drop-out rates overall and for each reason were found among IUD users, which were comparable to what was found in a previous study using 1994 Vietnam Intercensal Demographic Survey (GSO, 1996). In the meantime, nearly two in five oral pill users and one-third of condom users would stop using the method within a year. Method-related reasons for discontinuation were most frequently cited by users of all the three methods under study. Depending on the method, between 40 to 60 percent of all drop-outs were due to their dissatisfaction with the method adopted. Few IUD users got pregnant while using the method or stopped using because of other reasons that are not method-related in the first year of use. Meanwhile, 14 percent of oral pill users and 11 percent of condom users would discontinue the method by the end of the 12th month due to non-method-related reasons. Similarly, one-year failure rate was slightly higher among oral pill users than condom users – 11 percent and 9 percent respectively.

Failures and method-related reasons for discontinuation are our main interest in this study. Differential discontinuation rates by method due to these two main groups of reasons are portrayed in figures 2 and 3. Over time, the cumulative proportions of users who did not experience failures of oral pills and condoms remained similar to each other – while steadily decreasing - and were significantly lower than that of IUDs, which stayed fairly constant. In the contrast, the cumulative proportions of users who did not stop due to method-related reasons of all three methods declined with time, although the relative differences between methods seemed to be stable.

Figures 2 and 3 come here

Tables 4 and 5 presents results of the two-level discrete time logit models. The assumption of proportional hazard was tested with each independent variable by plotting the log-log survival function versus log of time, and we found that the assumption did not hold

for most of the independent variables (results not shown). Interactions between covariates and dummy variables of duration of use were then included in the model but they were not found to be statistically significant at the .05 level and thus, were not included in the tables.

Table 4 comes here

Influences of individual, community and programmatic factors on risks of having failures among users of oral pills, IUDs and condoms are presented in table 4. At the individual level, duration of use had an effect only among IUD users. As compared to IUD users who were in their first six months of use, those who had been using the method for 7-12 months would experience an increased rate of discontinuation due to failures. However, after the first year of use, risk of failures was no longer higher than that in the first six months. In the meantime, risks of failures did not seem to vary by duration among users of oral pills and condoms. Age of a woman when she adopted a contraceptive method had quite different effects on risks of failures among users of the three methods. Among oral pill users, the oldest group of adopters, i.e. 35-49 years old, had a higher risk of drop-out due to failures as compared to the youngest adopters (i.e. aged 15-25) in the bivariate analysis, but when other individual- and community-level factors were controlled for, it was no longer statistically significant. In the contrast, condom adopters of the same age group experienced significantly lower rate failures as compared to the youngest group, even when the other factors were controlled for. Meanwhile, the middle age groups of adopters only made a difference among IUD users. Users who were 25-29 at the time of their acceptance of IUDs had reduced risks of failures as compared to the youngest adopters, and it was statistically significant at .10 level. Being a paid employee was the only other individual-level factor that had an effect on failure rates among users of any of the three methods. Pill users who were gainfully employed had statistically significantly lower risks of failures as compared to pill users who were not gainfully employed.

Community-level factors had little effects on failure rates among users of oral pills, IUDs and condoms. Only pill users and condom users who lived at least 10km away from the nearest public transportation would have increased risks of failures as compared to those who lived within 5km of the nearest public transportation. The results were especially strongly significant for condom users. Among the programmatic factors, few had an influence on discontinuation due to failures among users of these three modern methods. Outreach activities by family planning field workers demonstrated some influence, in which oral pill users who lived in community that was visited at least once a month would have a significantly lower risk of having failures. This is a result one might expect, considering that the job of these field workers was to distribute non-clinical contraceptives, such as oral pills and condoms, and to reinforce their use. Field workers visiting a community at least once a month also seemed to lower failure risks among condom users in that community; however, the result was not statistically significant in the multivariate analysis. Surprisingly, if the health center visited in a community had more basic medical equipment available, failure rates among condom users in that community was much lower and the result was strongly significant at .01 level. Although various speculations could be made, it was unclear to us why a better equipped health center, which usually means that the health center is more ready

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to provide health services, not just family planning, would have a strong effect on failure rates of a such non-clinical method as condom and not on IUDs.

The picture of discontinuation due to method-related reasons among users of oral pills, IUDs and condoms as presented in table 5 is somewhat different. Duration of contraceptive use, at the individual level, still had a strong effect on rates of discontinuation due to method-related reasons. If a woman used IUD for more than 6 months, she would be less likely to drop because of method-related reasons, especially when she had been using the method for at least a year, the risk would be significantly reduced. In addition, oral pills and IUD users who belonged to a minority ethnic group experienced significantly higher rates of discontinuation due to method-related reasons, although ethnicity did not make any difference in failure rates. Meanwhile, paid employment demonstrated no effect on discontinuation due to reasons that are method-related among users of any of these methods.

Table 5 comes here

At the community level, distance to the nearest public transportation did not seem to be as important for discontinuation due to method-related reasons as it was for failures. Only condom users who lived between 6 and 10km away from the nearest public transportation had significantly higher rates of discontinuation due to these specific reasons. Higher rates of discontinuation because of method-related reasons were not found among condom users who lived farther – more than 10 km away from the nearest public transportation. In the contrast, living at least 6 km away from the nearest market was associated with IUD users being less likely to stop because of these reasons. Among the programmatic factors, family planning field workers visit was the only one that had a significant relationship with a change in discontinuation rates. Oral pills users who lived in a community that was visited by the field workers at least once a month had higher rates of discontinuation due to method-related reasons. One may argue that the frequent visits of field workers may create some level of convenience of oral pills supply in the community, where users know that if they stop using for any reason, they could easily resume use of the method, as long as they are not pregnant. On the other hand, it might be an evidence of a targeted program allocation, in which outreach activities to reinforce oral pills use were emphasized in areas when pills' discontinuation rates were high, especially if the high rates of drop-outs were mainly due to method-related reasons.

The opposite effects of frequency of family planning field worker visits on oral pill failure and method-related discontinuation rates were illustrated in the simulations. On average, only 0.8 percent of oral pill users had failures in the first 6 months of use. This percentage went up to nearly 1 percent and 1.6 percent during the second 6-month period and after one year. In all time durations, holding other factors constant, those oral pill users who lived in communities where field workers visited less than once a month had elevated failure rates – the increase was three-fold in all intervals. On the contrast, oral pill users in communities with more frequent visits by family planning field workers had increased drop-out rates due to method-related reasons. For example, in the first 6 months of use, 2.7 percent of oral pill users with at least one visit by field workers per month had discontinued for

method-related reasons, while only 1 percent of users with less frequent field workers' visits did so for the same reasons – the difference of 1.7 percentage point.

Figures 4 and 5 come here

Conclusions

Data from the 1997 Vietnam DHS shows that even with a high prevalence of contraceptive use, the contraceptive mix in Vietnam remains heavily IUD use, followed by condoms and oral pills. Consistent with studies elsewhere, among users of these three most commonly used methods of contraception, IUD users experienced the lowest overall discontinuation rate by the end of the first year of use, while between thirty and forty percent of oral pill and condom users would stop using the method by that time, respectively. IUDs users also had fewer failures and problems related to the method that resulted in discontinuation. Discontinuation due to failures (except among IUD users) and method-related reasons seemed to increase with time.

Two-level multivariate logit models were performed to assess influences of individual, community and programmatic factors on risks of having failures and discontinuation due to method-related reasons. At the individual level, duration of use was important only among IUD users but in opposite directions with regard to reasons for discontinuation – as compared to users who were in their first 6 months of use, those who had been using the method for 7-12 months experienced higher risk of failures but longer duration of use seemed to reduce risk of discontinuation for method-related reasons. Women in minority ethnic groups also had increased risks of oral pill and IUD drop-out for method-related reasons, as compared to Vietnamese women. People living in a more remote area seemed to experience higher risks of oral pill and condom discontinuation, but lower risks of IUD drop-outs. Among programmatic factors examined in this paper, the frequency of family planning field workers visit to the community arises as the most important factor – more frequent visits by the field workers were associated with lower risks of oral pill failures but increased risks of oral pill discontinuation due to method related reasons. One puzzle that needs further examination is the reason why condom users in community with better equipped health center would experience significantly lower risks of failures.

The study shares a number of measurement and methodological limitations that have been well known in the use of DHS data to assess quality of family planning services and its effects on contraceptive discontinuation as measured from the calendar section in the questionnaire. Motivational factors are not included in this preliminary analysis due to potential problem of endogeneity. In addition, only a limited number of programmatic factors are considered in this first exploratory analysis. Further studies are being carried out with more comprehensive measures of accessibility and quality of services. The results of this study suggest a number of directions for such further research, including the inter-relationships between field workers visits and oral pill discontinuation, and between the quality/readiness of community health centers and condom drop-outs. It will also be interesting to examine what methods, if any, that oral pill and condom discontinuers switched

to. Besides programmatic factors, the finding that minority ethnic women were more likely to drop IUD and oral pill use due to method-related reasons indicates a need for more efforts in providing these users with more comprehensive and/or understandable information on contraceptive use and where to seek help in cases of side effects.

Acknowledgement

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Table 1. Distribution of total number of episodes by specific contraceptive method among recent adopters in the last three years preceding the survey, Vietnam 1997 (N=1,868)

Method	Number of episodes	Percent
Oral pills	209	9.6
IUD	888	40.7
Condoms	261	11.9
Injectables	10	0.5
Sterilization	139	6.4
Traditional	638	29.2
Missing	39	1.8
Total	**2,184**	**100**

Table 2. Distribution of number of episodes per woman among recent adopters of oral pills, IUDs and condoms, Vietnam 1997.

Number of episodes	Number of women	Percent
1	1,113	90.8
2	98	8.0
3	11	0.9
4	4	0.3
Total	**1,226**	**100**

Table 3. Cumulative one-year discontinuation rates by method and reason for discontinuation among recent adopters of oral pills, IUDs and condoms, Vietnam 1997.

Method	N	Failure[1]	Method-related[2]	Others[3]	All reasons
Oral pills	209	11.0	18.6	13.9	38.0
IUDs	888	2.3	6.4	1.8	10.1
Condom	261	8.6	14.1	10.9	30.3

[1] Women reporting getting pregnant while using the method.

[2] Include "want more effective method", "health concerns", "side effects", "lack of access/too far", "cost too much" and "inconvenient to use".

[3] Include "infrequent sex/husband away", "wanted to become pregnant", "husband disapproved", "fatalistic", "difficult to get pregnant/menopause", and "marital dissolution/separation".

Table 4. Effects of individual, community and programmatic factors on contraceptive failures among adopters of oral pills, IUDs and condoms in the last 3 years preceding the survey, Vietnam, 1997.

| | Logit Coefficient (se) | | | | | |
| | Oral pills | | IUDs | | Condoms | |
	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.
Individual-level						
Duration						
1-6 months (ref.)	-	-	-	-	-	-
7-12 months	.11 (.57)	.15 (.64)	.98 (.55)	.99 (.46)*	-.24 (.51)	-.11 (.40)
13-36 months	.36 (.52)	.77 (.69)	.40 (.57)	.42 (.54)	-.17 (.49)	.31 (.49)
Age at start of episode						
15-25 (ref.)	-	-	-	-	-	-
25-29	.99 (.68)	1.14 (.75)	-1.48 (.77)	-1.44 (.82)	-.15 (.48)	-.32 (.55)
30-34	.30 (.82)	.92 (.88)	-.15 (.54)	-.06 (.67)	-.75 (.61)	-.61 (.68)
35-49	1.23 (.71)	1.32 (.94)	.41 (.54)	.59 (.56)	-1.34 (.79)	-1.26 (.58)*
Educational level						
Upto primary school (ref.)	-	-	-	-	-	-
Secondary	.41 (.49)	.39 (.69)	.52 (.57)	.51 (.56)	-.31 (.54)	.23 (.91)
High school or above	.01 (.69)	.07 (1.13)	.45 (.67)	.52 (.67)	-.33 (.57)	.28 (.94)
Religion						
No religion (ref.)	-	-	-	-	-	-
Buddhist	-.81 (.75)	-1.28 (.98)	.56 (..51)	.66 (.62)	-1.56 (1.02)	-1.16 (.92)
Others	-.73 (1.03)	-.85 (1.43)	-.32 (1.03)	-.66 (1.25)	-.33 (1.02)	.40 (1.29)
Minority ethnic group[1]	.01 (.63)	-.18 (.77)	-.42 (.74)	.12 (.54)	1.40 (.48)**	.57 (.75)
Paid employment	-1.08 (.52)*	-1.51 (.70)*	.24 (1.02)	.39 (1.11)	.25 (.74)	.66 (.80)
Community-level						
Urban	-.01 (.56)	-.24 (1.03)	.03 (.55)	.39 (.71)	-.17 (.42)	.31 (.95)
Distance to nearest public transportation						
0-5 km (ref.)	-	-	-	-	-	-
6-10 km	-.11 (1.06)	.61 (1.55)	.45 (.52)	.56 (.69)	.07 (.75)	.95 (.99)
10 km+	.86 (.46)	1.16 (.57)*	-.09 (.57)	.42 (.66)	1.93 (.46)***	2.76 (.83)**
Distance to nearest market						
In locality (ref.)	-	-	-	-	-	-
1-5 km	-.47 (.54)	-.27 (.82)	.36 (.45)	.57 (.57)	-.28 (.52)	.07 (.91)
6 km +	.22 (.58)	-1.13 (.78)	-.19 (.79)	.18 (.69)	1.23 (.53)*	-1.48 (.91)
Program-level						
Family planning field worker visits at least once a month	-1.12 (.46)*	-1.10 (.54)*	-.23 (.43)	-.50 (.49)	-.88 (.41)*	-.88 (.67)
Mobile family planning team visits at least once a month	.15 (.56)	.40 (.776)	.53 (.42)	.59 (.44)	.16 (.43)	.76 (.69)
Clinic has at least one staff who received training in family planning in the last 3 years	-.06 (.47)	.05 (.61)	-.28 (.42)	-.23 (.54)	.78 (.55)	.63 (.79)
Basic medical equipment available at the health clinic	-.08 (.09)	-.13 (.14)	.13 (.12)	.19 (.14)	-.35 (.10)**	-.41 (.13)**
N (woman-months)		2,105		13,519		3,317
Pseudo R-squared		.1037		.0578		.1283

* p<.05; ** p<.001
[1] Vietnamese is the reference group.

Table 5. Effects of individual, community and programmatic factors on contraceptive discontinuation due to method-related reasons among adopters of oral pills, IUDs and condoms in the last three years preceding the survey, Vietnam, 1997.

| | Logit Coefficient (se) | | | | | |
| | Oral pills | | IUDs | | Condoms | |
	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.
Individual-level						
Duration						
1-6 months (ref.)	-	-	-	-	-	-
7-12 months	-.52 (.44)	-.45 (.47)	-.60 (.32)	-.55 (.32)	.37 (.38)	.43 (.39)
13-36 months	-.62 (.44)	-.35 (.50)	-.96 (.32)**	-.85 (.32)**	-.97 (.57)	-.82 (.63)
Age at start of episode						
15-25 (ref.)	-	-	-	-	-	-
25-29	-.33 (.47)	-.39 (.51)	-.02 (.29)	-.04 (.30)	-.47 (.44)	-.66 (.43)
30-34	.20 (.44)	.12 (.61)	-.58 (.40)	-.53 (.39)	-.67 (.51)	-.80 (.58)
35-49	-.08 (.51)	-.01 (.57)	-.31 (.45)	-.28 (.40)	-.75 (.54)	-.78 (.58)
Educational level						
Upto primary school (ref.)	-	-	-	-	-	-
Secondary	.13 (.39)	-.00 (.43)	-.38 (.29)	-.22 (.32)	-.48 (.47)	-.84 (.50)
High school or above	.38 (.45)	.26 (.69)	-.42 (.37)	-.05 (.43)	-.27 (.48)	-.74 (.48)
Religion						
No religion (ref.)	-	-	-	-	-	-
Buddhist	-.69 (.54)	-.07 (.54)	.13 (.36)	.29 (.39)	-.38 (.54)	-.13 (.63)
Others	-1.30 (1.02)	-.92 (1.27)	.46 (.43)	.48 (.53)	-.53 (1.02)	-.24 (1.12)
Minority ethnic group[1]	.70 (.39)	.87 (.40)*	1.04 (.28)***	1.42 (.41)**	.54 (.53)	.93 (.82)
Paid employment	-.12 (.54)	-.30 (.58)	-.42 (.47)	-.37 (.55)	.12 (.61)	.29 (.82)
Community-level						
Urban	.16 (.41)	-.002 (.60)	.16 (.32)	.06 (.39)	.09 (.36)	.42 (.48)
Distance to nearest public transportation						
0-5 km (ref.)	-	-	-	-	-	-
6-10 km	.62 (.50)	-.12 (.55)	.00 (.39)	.09 (.38)	.66 (.46)	.84 (.42)*
10 km+	-.27 (.42)	-.58 (.49)	.50 (.29)	.36 (.38)	-.56 (1.02)	-1.43 (1.21)
Distance to nearest market						
In locality (ref.)	-	-	-	-	-	-
1-5 km	.03 (.40)	.03 (.60)	-.31 (.27)	.03 (.31)	.49 (.37)	.53 (.40)
6 km +	.73 (.43)	.73 (.82)	.03 (.38)	-.83 (.42)*	.11 (.75)	.001 (.90)
Program-level						
Family planning field worker visits at least once a month	1.10 (.48)*	1.01 (.50)*	.15 (.28)	.36 (.30)	.07 (.39)	-.23 (.44)
Mobile family planning team visits at least once a month	.77 (.37)*	.57 (.45)	-.27 (.29)	-.23 (.36)	.61 (.36)	.63 (.45)
Clinic has at least one staff who received training in family planning in the last 3 years	-.03 (.36)	-.02 (.43)	.20 (.27)	.33 (.27)	-.04 (.38)	.07 (.44)
Basic medical equipment available at the health clinic	-.08 (.07)	-.003 (.11)	.01 (.07)	.03 (.08)	-.08 (.09)	-.10 (.12)
N (woman-months)		2,105		13,519		3,317
Pseudo R-squared		.0629		.0431		.0607

* p<.05; ** p<.001
[1] Vietnamese is the reference group.

FIGURE

Figure 1. A conceptual framework for the study of contraceptive adoption and
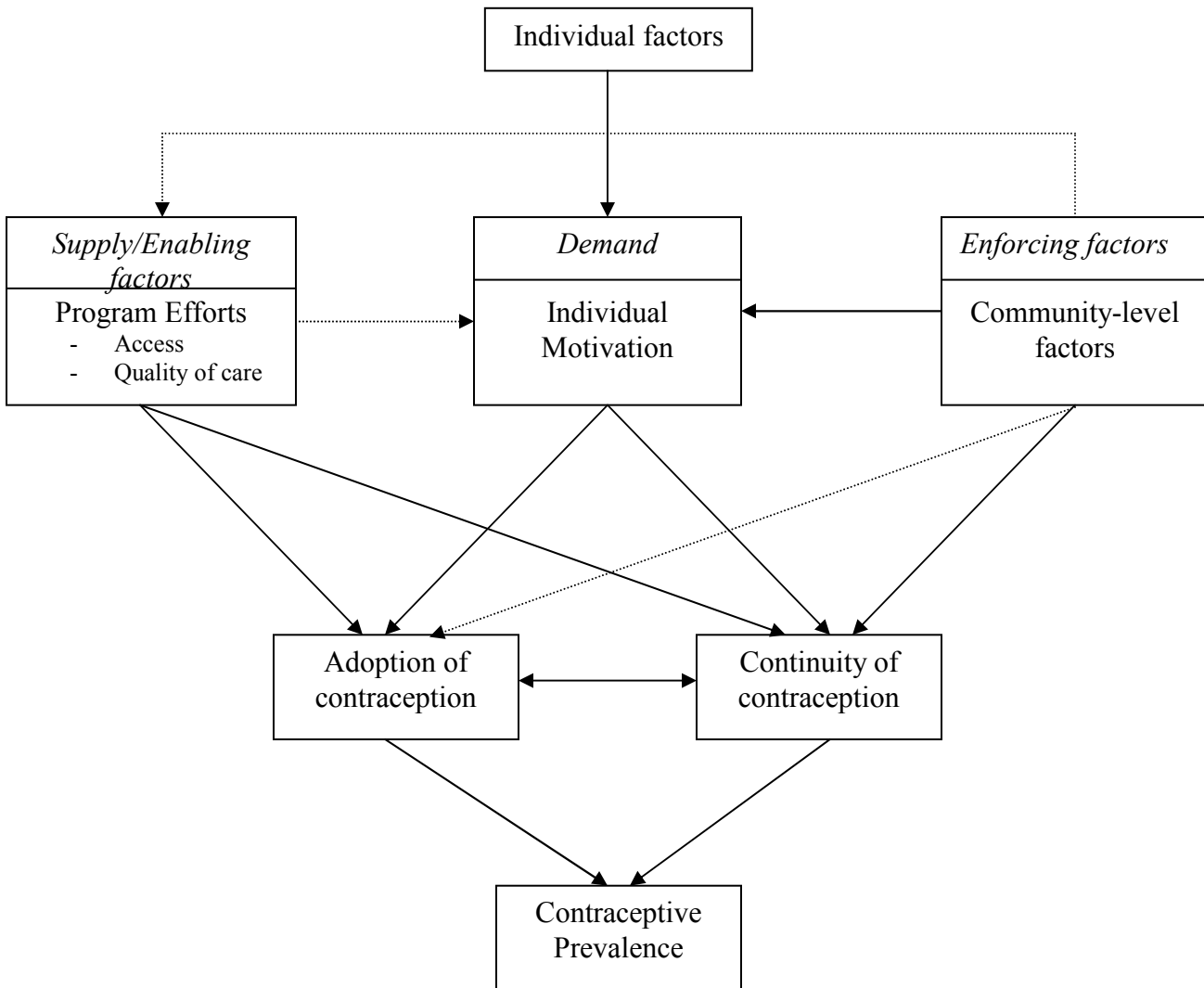discontinuation. (adapted from Phillips, 1980 and Jain, 1989)

Figure 2. Overall survival rates (not having failures) by method and duration (months) among adopters of oral pills, IUDs and condoms in the last three years before the survey, Vietnam, 1997.
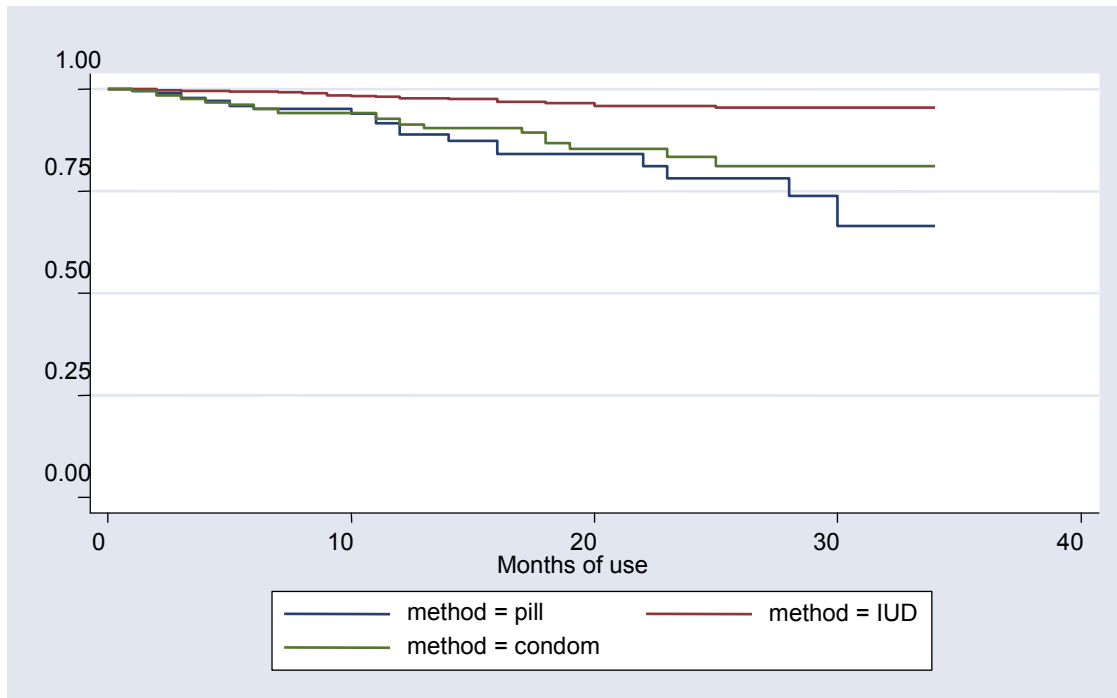
Figure 3. Overall survival rates (not discontinuing due to method-related reasons) among adopters of oral pills, IUDs and condoms in the last three years before the survey, Vietnam, 1997.
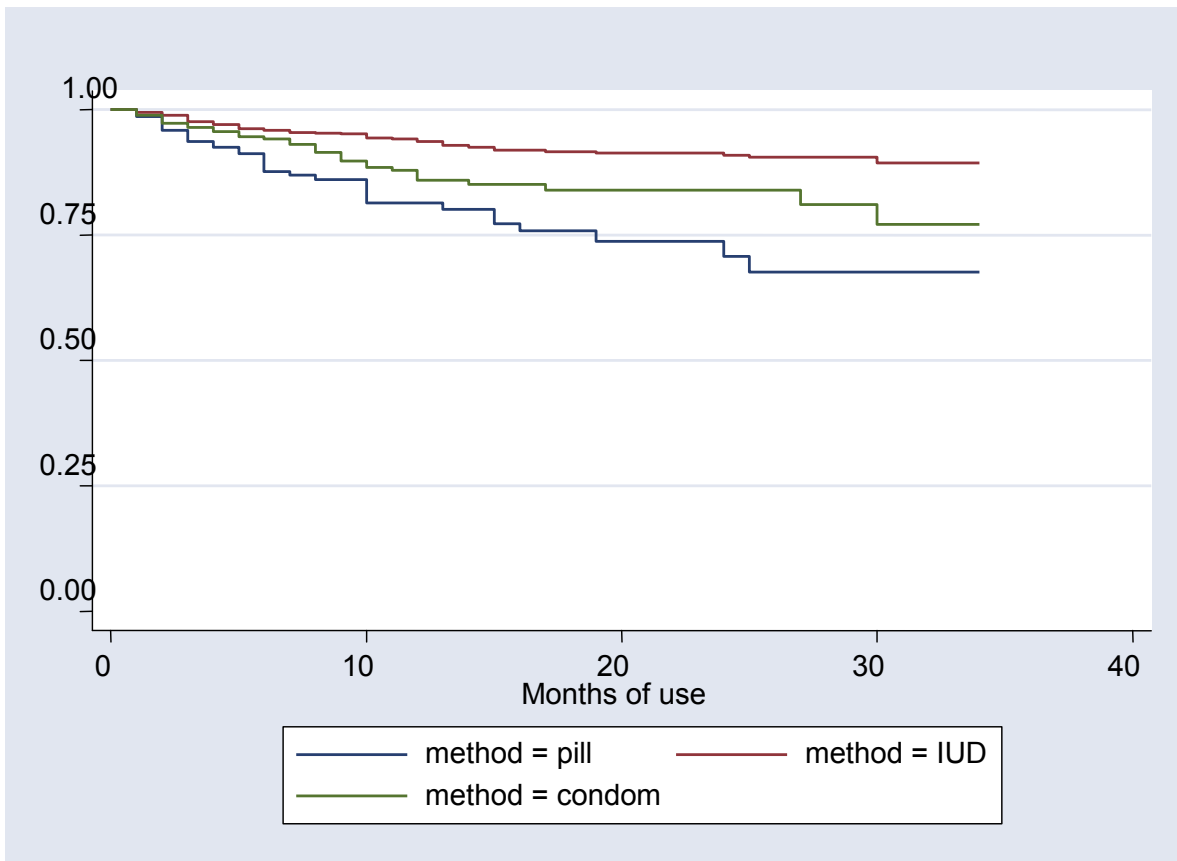
Figure 4. Simulated effects of frequency of field worker visits on oral pill failures, Vietnam, 1997.
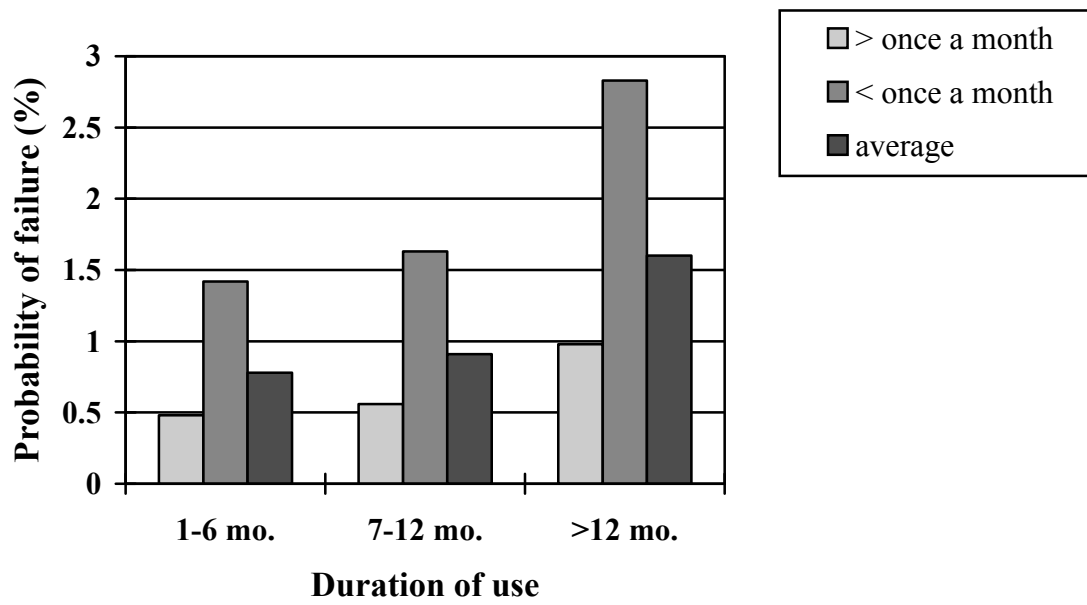
Figure 5. Simulated effects of frequency of field worker visits on oral pill method-related discontinuation, Vietnam, 1997.