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Sub-national Analysis of Contraceptive Discontinuation among Women in Nigeria: Evidence from the Demographic and Health Survey

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ABSTRACT

Despite efforts to increase contraceptive use in Nigeria, the relevant indicators have remained poor. Nigeria's modern contraceptive prevalence rate (mCPR) of 12% is one of the lowest in the world. The contraceptive discontinuation rate among women in Nigeria is high at 41%. A sub-national analysis of Nigeria's mCPR reveals a dismal situation, with mCPR ranging from 2% in Sokoto State (North West) and Yobe State (North East) to 29% in Lagos State (South West). This study examined the reasons and determinants of contraceptive discontinuation across sub-national levels in Nigeria. Data for the study came from the individual women's recode of the 2018 Nigeria Demographic and Health Survey, with a weighted total of 180,999 events (birth, pregnancy, termination, and contraceptive use) in the 5 years before the survey; 10,384 episodes of contraceptive use; and 6,365 episodes of discontinuation among 4,974 women age 15–49. Relationships between the dependent variable (contraceptive discontinuation) and the explanatory variables were explored with the Cox proportional hazards model. The results show a substantial disparity in contraceptive discontinuation episodes across the six regions of Nigeria – highest in the South West (28.0%), and lowest in the North East (11.1%). The discontinuation rate for all methods was lowest in the South West (32.5%) and highest in the North West (50.1%). Across most regions, the highest discontinuation rate was attributed to pregnancy or fertility-related reasons. The Cox models indicate that, when compared to the South West Region, the risks of discontinuing contraceptives were significantly higher in North Central and North West (hazard ratio (HR) = 1.4, 95% confidence interval (CI) [1.2, 1.7] $p < .001$), South East (HR = 1.5, 95% CI [1.2, 1.9] $p < .001$), and North East (HR = 1.3, 95% CI [1.0, 1.5] $p < .05$). The study suggests the need for context-specific family planning programming that considers the country's diversity when addressing the problem of contraceptive discontinuation in order to ensure better reproductive health outcomes in Nigeria.

Key words: Contraceptive discontinuation, contraceptive use, women, sub-national levels, Nigeria

1 INTRODUCTION

Family planning (FP) has contributed to global reductions in undesirable demographic and health outcomes such as unintended pregnancies, unwanted births, unsafe abortion, maternal mortality, and childhood deaths. Despite the progress made globally, millions of women across low- and middle-income countries (LMICs) continue to have unintended pregnancies and unwanted births, with an estimated 74 million unintended pregnancies occurring every year.[1] More than 30% of these pregnancies can be attributed to contraceptive failure and contraceptive discontinuation among women who use some type of contraceptive method. Contraceptive discontinuation remains high in LMICs. A study of 25 LMICs found that 38% of women discontinued contraceptive use within 12 months, with 55% and 64% discontinuing use within 24 and 36 months, respectively.[2] In Nigeria, the most populous African country, many women and their spouses desire fewer children or wish to postpone the timing of future births. However, failure to use contraception and contraceptive discontinuation remain high among them despite their sexual exposure and expressed intention to avoid pregnancy.[3–5]

Contraceptive prevalence and other relevant FP indicators remain poor in Nigeria. The country's modern contraceptive prevalence rate (mCPR) of 12% among currently married women is one of the lowest globally.[6,7] A sub-national analysis of Nigeria's mCPR reveals a dismal situation, with modern contraceptive use among currently married women ranging from 2% in Sokoto State (North West) and Yobe State (North East) to 29% in Lagos State (South West).[7] Unmet need for FP is high at 48% among sexually active unmarried women, and 19% among currently married women. The contraceptive discontinuation rate among women in Nigeria was 41% in 2018, compared to lower rates in many other sub-Saharan African countries such as Rwanda (30%) and Zimbabwe (22%).[8,9]

Although many programs such as the demand- and the supply-side interventions of Nigeria Urban Reproductive Health Initiatives have been designed to improve contraceptive use in the country,[6,10] several barriers continue to threaten progress. As a result, the new mCPR target of 27% for Nigeria was not achieved in 2020.[11] Several supply- and demand-side factors have been identified as barriers to the success of the FP program in Nigeria. The supply-side barriers include limited access to services, poor quality of services, and cost.[6,12,13] The demand-side factors that may explain low use of contraceptives in Nigeria include myths and misconceptions, fear of adverse effects, poverty, partner's disapproval, cultural and religious beliefs, illiteracy, and contraceptive discontinuation due to other reasons.[14–16] While interventions have attempted to address many of these barriers, contraceptive discontinuation appears to be thwarting the achievement of Nigeria's FP targets and goals for healthy birth spacing and child limiting. Scholars have argued that further increases in mCPR and achievement of FP targets will largely depend on continuation as well as re-adoption by past users.[17,18] Of the several factors that affect the success of the FP program in Nigeria, contraceptive discontinuation, particularly at the sub-national level, has been less investigated.

Given the large sub-national variation in mCPR in Nigeria, a one-size-fits-all intervention program may not be capable of addressing the particular barriers to consistent contraceptive use in different states and regions of the country. Thus, there is a need for context-specific FP programs. The evidence base is weak on the sub-national analysis of reasons for contraceptive discontinuation in Nigeria. Little systematic information exists on contraceptive discontinuation by method types and the factors that influence discontinuation at the sub-national level. This raises the need for empirical investigation. Since reducing contraceptive

discontinuation could increase the mCPR across regions in the country, this study focused on a sub-national analysis of reasons for contraceptive discontinuation, the rates, and determinants among women age 15–49 in Nigeria.

1.1 Research Question

This study addressed the following specific questions:

- What are the reasons for contraceptive discontinuation by method type across regions in Nigeria?
- To what extent do contraceptive discontinuation rates by method type vary across sub-national regions in Nigeria?
- What are the determinants of contraceptive discontinuation among women in Nigeria?

1.2 Literature Review

Scholars have established that the dynamics of contraceptive use, discontinuation, switching, and failures are key markers of how well FP programs meet the contraceptive needs of men and women.[2] Contraceptive discontinuation continues to worsen the problem of unintended pregnancy in many low- and middle-income countries (LMICs), particularly among women who would like to avoid pregnancy but are not using any method of contraception.[19] Empowering women to use contraceptives and avoid unintended pregnancy remains a challenge across many LMICs. Studies have shown that the rates of contraceptive discontinuation are high, and are even increasing in some LMICs.[19,20] One study of reasons for contraceptive discontinuation in eight selected LMICs found a high likelihood of abandoning pills and male condoms while in need of contraception in most of the countries that were studied.[21] The study found significantly higher odds of abandoning most modern methods compared to traditional methods in Kenya.[21] A recent study in Tanzania by Sato et al. also established a high rate of discontinuing the use of modern methods, including male condoms, pills, and injectables, which supported the previous analysis by Bradley and colleagues.[22] Other studies reported early discontinuation of long-acting reversible contraception such as the intrauterine device and implants.[23,24]

Evidence from the literature suggests that sociodemographic characteristics, contextual, and cultural factors influence contraceptive use and decisions to discontinue contraceptives among women. Commonly cited reasons for contraceptive discontinuation while in need include perception of the dangers of prolonged use of methods, fear of adverse effects or health concerns, and dissatisfaction.[25,26] Several studies have been conducted on contraceptive discontinuation in Nigeria. Available evidence from those Nigerian studies found a significant relationship between contraceptive discontinuation and ethnic affiliation,[27] experience of intimate partner violence,[28] and the influence of sociodemographic characteristics.[29] One study that used facility-based data from a hospital in Eastern Nigeria found that 19% of women who had the Implanon™ implant discontinued the method within one year due to side effects.[30] However, evidence is sparse on the reasons for contraceptive discontinuation at sub-national level in Nigeria and more specifically, reasons for discontinuation, determinants of discontinuation, and types of method that are discontinued. The present study addresses this identified gap in the literature.

This study is guided by the ideation model and the health belief model. The ideation model, advanced by Kincaid, postulates that individuals tend to hold different ideas, opinions, and views about certain outcomes or behaviors.[36] Kincaid suggested that ideation is a construct that directly links behavior and contextual variables and that the ideation model can be measured at the individual and contextual levels. Kincaid proposed that ideation has three domains—emotional, cognitive, and social interaction. The emotional domain includes norms, values, knowledge, and perceived risk, while the cognitive domain includes preferences, emotional response, and self-efficacy. The third domain (social interaction) includes interpersonal communication, social influence, and support.

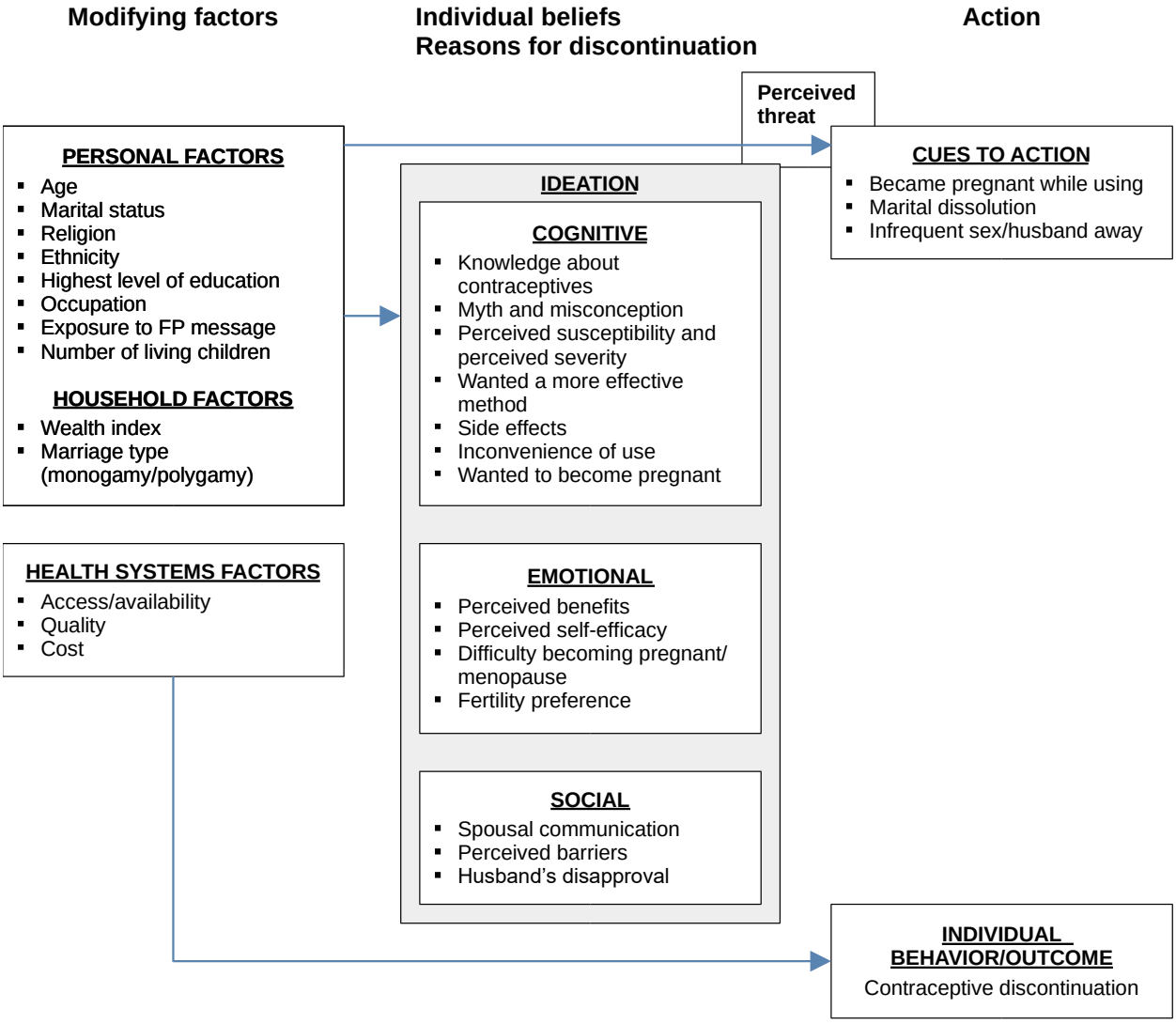
Babalola et al. suggested that ideation theory is relevant for the study of contraceptive use because the elements of ideation affect contraceptive non-use or use, as well as contraceptive discontinuation, readoption, or continuation.[31] Many studies have applied the ideation model and established relevant findings on the relationship between the key ideational elements and contraceptive use or non-use. For example, Adedini et al. found a significant relationship between FP messages from religious leaders (social interaction dimension in the ideation model) and increased modern contraceptive use.[6] Studies have also shown a significant relationship between positive attitudes about contraception (cognitive dimension) and increase in contraceptive use.[18,31] In a study of ideation and intention to use contraceptives in Kenya and Nigeria, Babalola et al. had established a significant association between contraceptive use intention and four dimensions of ideation.[31] Studies have also established a link between fear of adverse effects (perceived risk) or partner disapproval (social influence) and non-use or contraceptive discontinuation.[32,33]

The health belief model includes several concepts that predict the reasons individuals will take a health-related action to prevent, treat, or control a condition.[34,35] The concepts include perceived susceptibility, severity (perceived threat), benefits and barriers to behavior, cues to action, and self-efficacy. Individuals view themselves as susceptible to a condition, believe that condition would have potentially serious consequences, believe that a course of action available to them would be beneficial in reducing either their susceptibility to or severity of the condition, and believe the anticipated benefits of taking action outweigh the barriers to (or costs of) action are likely to take action that they believe will reduce their risks.

By using the two theoretical models, we hypothesize that ideation dimensions such as knowledge, beliefs or misconceptions, perceived risks, and social influence and support influence contraceptive discontinuation among women. Based on the health belief model, the various reasons given by women for discontinuing contraceptives represent the various constructs of the model that result in discontinuation. As shown in Figure 1, diverse demographic, sociopsychological, and structural factors may have an indirect or direct influence on perceptions and beliefs that become the reasons for discontinuation. For example, sociodemographic characteristics have an indirect impact on perceptions of susceptibility, severity, benefits, and barriers that lead to a health-related action.

1.3 Conceptual Framework

Figure 1 Conceptual framework for the study of contraceptive discontinuation



Note: Figure 1 is adapted from the Ideation Model and Health Belief Model frameworks.[34,36]

2 DATA AND METHODS

2.1 Data

The data were obtained from the individual women's recode of the 2018 Nigeria Demographic and Health Survey (NDHS). The NDHS is a nationally representative household survey that provides current estimates of basic demographic and health indicators using a nationally representative sample of women and men age 15 to 49. The NDHS is implemented by the National Population Commission (NPC) with technical support from ICF through the DHS Program, which is funded by the U.S. Agency for International Development (USAID). The 2018 survey was conducted between August 14 and December 29, 2018.

The study population for this research is women age 15–49 who have ever used any contraceptives. The unit of analysis is episodes of contraceptive use. The DHS collects information on reproduction and contraception by using a month-by-month calendar. The calendar is usually called a reproductive or contraceptive calendar. All key reproductive events—birth, pregnancy, termination, contraceptive use, non-use, and the reasons for discontinuation of contraceptive use—are recorded on a monthly basis. The calendar contains these events as reported by the respondent for the year of the survey up to the month of the interview, and the 5 calendar years before the survey, which is typically a total of 72 months. However, the calendar period varies across countries depending on the duration of data collection, and from respondent to respondent depending on the date of the interview. The 2018 NDHS contraceptive calendar records all the reproductive events from 2013 to 2018. There were weighted total of 180,999 events (birth, pregnancy, termination, and contraceptive use) in the 5 years before the survey; 10,384 episodes of contraceptive use; and 6,365 episodes of discontinuation by 4,974 women age 15–49. From Phase 7 of the DHS (DHS-7), the calendar has two columns. Events of birth, pregnancy, termination, and contraceptive use or non-use are recorded in column 1, while the reason for discontinuation of contraceptive use is recoded in column 2 (Figure 2).

Figure 2 DHS-7 Contraceptive Calendar

INSTRUCTIONS:

ONLY ONE CODE SHOULD APPEAR IN ANY BOX.
COLUMN 1 REQUIRES A CODE IN EVERY MONTH.

CODES FOR EACH COLUMN:

COLUMN 1: BIRTHS, PREGNANCIES, CONTRACEPTIVE USE (2)

- B BIRTHS
- P PREGNANCIES
- T TERMINATIONS

- 0 NO METHOD
- 1 FEMALE STERILIZATION
- 2 MALE STERILIZATION
- 3 IUD
- 4 INJECTABLES
- 5 IMPLANTS
- 6 PILL
- 7 CONDOM
- 8 FEMALE CONDOM
- 9 EMERGENCY CONTRACEPTION
- J STANDARD DAYS METHOD
- K LACTATIONAL AMENORRHEA METHOD
- L RHYTHM METHOD

- M WITHDRAWAL
- X OTHER MODERN METHOD
- Y OTHER TRADITIONAL METHOD

COLUMN 2: DISCONTINUATION OF CONTRACEPTIVE USE

- 0 INFREQUENT SEX/HUSBAND AWAY
- 1 BECAME PREGNANT WHILE USING
- 2 WANTED TO BECOME PREGNANT
- 3 HUSBAND/PARTNER DISAPPROVED
- 4 WANTED MORE EFFECTIVE METHOD
- 5 SIDE EFFECTS/HEALTH CONCERNS

- 6 LACK OF ACCESS/TOO FAR
- 7 COSTS TOO MUCH
- 8 INCONVENIENT TO USE
- F UP TO GOD/FATALISTIC
- A DIFFICULT TO GET PREGNANT/MENOPAUSAL
- D MARITAL DISSOLUTION/SEPARATION
- X OTHER

_____ (SPECIFY)

- Z DON'T KNOW

				COL. 1	COL. 2	
	02	FEB	01			2019
	01	JAN	02			
	12	DEC	03			
	11	NOV	04			
	10	OCT	05			
2	09	SEP	06			2
	08	AUG	07			
0	07	JUL	08			0
1	06	JUN	09			1
	05	MAY	10			
8	04	APR	11			8
	03	MAR	12			
	02	FEB	13			
	01	JAN	14			
	12	DEC	15			
	11	NOV	16			
	10	OCT	17			
2	09	SEP	18			2
	08	AUG	19			
0	07	JUL	20			0
1	06	JUN	21			1
	05	MAY	22			
7	04	APR	23			7
	03	MAR	24			
	02	FEB	25			
	01	JAN	26			
	12	DEC	27			
	11	NOV	28			
	10	OCT	29			
2	09	SEP	30			2
	08	AUG	31			
0	07	JUL	32			0
1	06	JUN	33			1
	05	MAY	34			
6	04	APR	35			6
	03	MAR	36			
	02	FEB	37			
	01	JAN	38			
	12	DEC	39			
	11	NOV	40			
	10	OCT	41			
2	09	SEP	42			2
	08	AUG	43			
0	07	JUL	44			0
1	06	JUN	45			1
	05	MAY	46			
5	04	APR	47			5
	03	MAR	48			
	02	FEB	49			
	01	JAN	50			
	12	DEC	51			
	11	NOV	52			
	10	OCT	53			
2	09	SEP	54			2
	08	AUG	55			
0	07	JUL	56			0
1	06	JUN	57			1
	05	MAY	58			
4	04	APR	59			4
	03	MAR	60			
	02	FEB	61			
	01	JAN	62			
	12	DEC	63			
	11	NOV	64			
	10	OCT	65			
2	09	SEP	66			2
	08	AUG	67			
0	07	JUL	68			0
1	06	JUN	69			1
	05	MAY	70			
3	04	APR	71			3
	03	MAR	72			
	02	FEB	73			
	01	JAN	74			

Source: Nigeria DHS 2018

Each event, contraceptive method, and reason for discontinuation is identified with a code—a number or letter. Birth is entered as "B" in the month of birth in the calendar. The name of the child is located to the left of the 'B' code (names of children in case of multiple births). Pregnancies that ended in stillbirth, abortion, or miscarriage are entered as "T" which denotes termination. The completed months of pregnancy before the birth or termination is entered a "P" for the period of pregnancy, which is usually 8 months for pregnancies that ended in a live birth, and for the period the pregnancy lasted for termination. The use and non-use of contraceptives between the periods of birth and pregnancy, starting with the most recent use, is explored and then entered into the calendar. Zero is entered if no method is used.

2.2 Variables

2.2.1 Dependent variables

The dependent variable is contraceptive discontinuation, which we measured in two ways. One was a rate, with the percentage of contraceptive episodes discontinued within 12 months among women age 15–49. This measure was used to describe the discontinuation rate in all episodes of contraceptive use for each method and for the various reasons for discontinuation.

Second, we used a time variable measured as time to the event of discontinuation of contraceptive use, which was defined as the duration of the risk period up to the occurrence of the contraceptive discontinuation. This measure was used to estimate the determinants of contraceptive discontinuation.

2.2.2 Independent variables

The potential explanatory variables were identified from the literature and guided by the theoretical framework. These include type of contraceptive methods, which was categorized into 10 categories for the analyses that are based only on the 6,365 episodes of discontinuation, the description of the characteristics of the study population, reasons for discontinuation by method type, and other characteristics of the respondents. The 10 categories are pill, injectable, male condom, periodic abstinence/rhythm, withdrawal, other traditional methods, implant, lactational amenorrhea method (LAM), emergency contraceptives (EC), and others (IUD, female condom, other modern methods, and standard days method). The other category included methods with an unweighted count of discontinuation episodes that was less than 125. The analysis for discontinuation rate and the Cox proportional hazard model were based on all episodes of contraceptive use, and the method types were categorized into nine—IUD, pill, injectable, implant, male condom, periodic abstinence/rhythm, withdrawal, LAM, and other. Female condom, standard days method, other traditional methods, other modern methods, emergency contraception, and female sterilization were grouped with "other" due to the small number of cases.

The reasons for discontinuation were categorized into eight from 13 response categories to describe the study population and the reasons for discontinuation: became pregnant while using, wanted to become pregnant, husband disapproved, side effects, wanted more effective method, inconvenient use, infrequent sex/husband away, and other (access/availability, cost, fatalistic, difficult to become pregnant/menopause, marital dissolution, other, and don't know). For the discontinuation rate and regression, we further re-categorized the reasons into seven, including method failure (became pregnant while using), desire to become pregnant (wanted to become pregnant), other fertility-related reasons (infrequent sex/husband away, husband disapproval, and difficult to become pregnant/menopause), side effects/health concerns (side

effects and health concerns), wanted more effective method, other method related reasons (access/availability, inconvenient to use, and cost), and other (fatalistic, marital dissolution, other, and don't know).

The re-categorization of the reasons were due to the small number of cases in some of the original categories. Age was recoded into 15–24, 25–29, 30–34, 35–39, and 40–49, marital status (never in a union, in a union, and formerly in a union), and number of living children (<4, 4, and 5+). Number of living children is recoded to fit into Nigeria's national policy on population for sustainable development that recommends 4 children per woman.[7] Other variables are highest level of education, religion (traditional and other religion was dropped due to small number of cases), work status (not working and working), ethnicity recoded into the three major ethnic groups in Nigeria (Hausa/Fulani, Igbo, Yoruba), and others. Variables that measure access to healthcare for oneself were included. These included obtaining permission to go to a health facility, finding money needed for treatment, distance to a health facility, and not wanting to go alone. Regions included the six geopolitical regions of Nigeria. Administratively, Nigeria includes 36 states, and a federal capital territory, Abuja. These 37 federating units are classified into six based on geographical location and similar sociocultural features. The six regions are the North Central, North East, North West, South East, South South, and South West. The sub-national analysis is based on the region.

2.3 Statistical analysis

The contraceptive calendar data were converted into a file of single months. This file, which includes the month as the unit of analysis, was used to generate the reasons for discontinuation for all episodes of contraceptive use in the calendar, disaggregated by type of method.

To generate the discontinuation rate, the calendar data was converted into an event file, so that the event became the unit of analysis, instead of months. Each continuous episode or segment of contraceptive use, non-use, pregnancy, birth, or termination is represented by a single entry in the event file. The file also contains details on when the episode began, when it ended, how long the episode lasted, and what event preceded or followed the event. To calculate the discontinuation rate and 95% confidence interval, a life table and competing risk approach were used. All episodes of birth, pregnancies, terminations, and non-use were dropped from the analysis. The exposure time was restricted to 3 to 62 months before the survey. Events that began in the month of the interview and 2 months prior, and those that started and ended before 62 months prior to the survey, were dropped from the analysis. This is to prevent underestimation of the discontinuation rate due to method failure since many women do not realize they are pregnant in the first 3 months of pregnancy, and late entry (events before 62 months).

The events of discontinuation were described by selected characteristics of the women, region, and reasons for discontinuation using a frequency distribution. A sub-national bivariate analysis of discontinuation by reasons and methods was conducted. The statistics for this analysis was chi-square. Cox proportional hazards model was used for the multivariable analysis to examine the risk of discontinuation by the respondents' characteristics. The unit of analysis was the episode of contraceptive use, and exposure or observation time was 3 to 62 months before the survey. Those who discontinued in the last three months before the interview, discontinued for reason of switching, and late entry were censored.

The basic proportional hazards regression assumes the relationship

$$h(t) = h0(t) \exp(\beta 1x1 + \cdots + \beta kxk)$$

where h0(t) is the baseline hazard function.

To adjust for non-response and sampling probability, weights were used in all the analysis. The *svy* command in Stata was used to adjust for the complex sampling design of the DHS data. All analyses were conducted using Stata 17, with statistical significance set at .05.

3 RESULTS

3.1 Description of the Study Population by Contraceptive Discontinuation Episodes

Table 1 presents the contraceptive discontinuation episodes by the respondents' characteristics. The highest number of discontinuation episodes occurred among users of injectable contraceptives, while the fewest episodes were attributed to emergency contraception and other methods. The majority of discontinuation episodes occurred because the women wanted to become pregnant, while the fewest discontinuations occurred because the woman's husband disapproved of her use of contraceptives. The number of discontinuation episodes varied by region, with highest in the South West and lowest in the North East. Women age 25–29 had the highest number of discontinuation episodes, while women over age 40 had the fewest episodes. More than half of contraceptive discontinuation episodes occurred among women who had fewer than four children, while the fewest episodes were recorded among women with four children. Contraceptive discontinuation episodes differed by place of residence, with the majority of contraceptive discontinuation episodes occurring among urban women. More than half of discontinuation episodes occurred among women with secondary education and the fewest were recorded among women with no education.

The frequency of contraceptive discontinuation varied by women's household wealth status, with the highest number of episodes among women in the richest and richer wealth quintiles, while women in the poor and poorest quintiles had the lowest number of episodes. More than half of discontinuation episodes occurred among women in the "other Christian" category, and the fewest episodes were recorded among women in the traditional and other religion category. The majority of contraceptive discontinuation episodes occurred among women who were working (78.5%). Similarly, the majority (94.1%) of contraceptive discontinuations occurred among women who did not have a problem obtaining permission to go to the health facility; those who did not have a problem finding money to go to the health facility (61.0%); those who reported that distance to the health facility was not a problem (81.5%); and those who did not have a problem with going alone to the health facility (91.7%). The majority of discontinuation episodes occurred among women who were currently in a union, and fewest among women formerly in a union.

Table 1 Description of discontinuation episodes, by characteristics

Variables	Number	Percent
Contraceptive methods		
Pill	856	13.4
Injectables	1,243	19.5
Condom	909	14.3
Periodic abstinence/rhythm	577	9.1
Withdrawal	1,127	17.7
Other traditional methods	242	3.8
Implant	350	5.5
LAM	752	11.8
EC	160	2.5
Other	150	2.4
Reasons for discontinuation		
Became pregnant while using	931	14.6
Wanted to become pregnant	2,244	35.3
Husband disapproved	206	3.2
Side effects	890	14.0
Wanted more effective method	641	10.1
Inconvenient use	297	4.7
Infrequent sex/husband away	701	11.0
Other	455	7.2
Region		
North Central	751	11.8
North East	705	11.1
North West	781	12.3
South East	1,431	22.5
South South	915	14.4
South West	1,782	28.0
Age		
15–24	875	13.7
25–29	1,780	28.0
30–34	1,686	26.5
35–39	1,227	19.3
40–49	797	12.5
Number of living children		
<4	3,775	59.3
4	959	15.1
5+	1,631	25.6
Type of place of residence		
Urban	4,165	65.4
Rural	2,200	34.6
Highest educational level		
No education	762	12.0
Primary	962	15.1
Secondary	3,372	53.0
Higher	1,269	19.9

Continued...

Table 1—*Continued*

Variables	Number	Percent
Wealth index		
Poorest	302	4.7
Poorer	633	9.9
Middle	1,154	18.1
Richer	1,832	28.8
Richest	2,444	38.4
Religion		
Catholic	1,070	16.8
Other Christian	3,259	51.2
Islam	2,024	31.8
Traditional/Other	13	0.2
Respondent currently working		
No	1,371	21.5
Yes	4,995	78.5
Getting medical help for self: getting permission to go		
Big problem	378	5.9
Not a big problem	5,987	94.1
Getting medical help for self: getting money needed for treatment		
Big problem	2,483	39.0
Not a big problem	3,882	61.0
Getting medical help for self: distance to health facility		
Big problem	1,176	18.5
Not a big problem	5,189	81.5
Getting medical help for self: not wanting to go alone		
Big problem	528	8.3
Not a big problem	5,387	91.7
Marital status		
Never in union	518	8.1
Currently in a union	5,544	87.1
Formerly in union	303	4.8
Total	**6,365**	**100.0**

3.2 Reasons for Contraceptive Discontinuation by Method Type Across Regions

The reasons for contraceptive discontinuation are presented by the characteristics of the respondents in Table 2. The reasons by methods at the national and sub-national levels are presented in Table 3.

3.2.1 Reasons for discontinuation by respondents' characteristics

Table 2 presents the reasons for contraceptive discontinuation by respondents' characteristics for the entire country. In all regions, the most frequent reason cited for contraceptive discontinuation was the desire to become pregnant, while the least frequent reason cited was husband's disapproval, except for the North West where infrequent sex was the least cited reason for discontinuation. This was consistent among most women, whether segregated by age, number of children ever born, place of residence, educational status, household wealth status, religion, employment status, health facility access variables (permission, money

for treatment, distance and not wanting to go alone), and marital status. The exceptions were for women with no education and those in poorer households, who had inconvenient use as their least cited reason for discontinuation, and Muslim and traditional religious women who had inconvenience and infrequent sex as the least reported reasons for discontinuation. Also, among never married and formerly married women, the most common reason for discontinuation was infrequent sexual activity. For never married women, the least common reason for discontinuation was wanting to become pregnant, while husband's disapproval was the least common reason for formerly married women.

Table 2 Reasons for contraceptive discontinuation, by other characteristics

	Reasons for contraceptive discontinuation								
	Became pregnant while using	Wanted to become pregnant	Husband disap-proved	Side effects	Wanted more effective method	Incon-venient use	Infre-quent sex/ husband away	Other	*p* value
Region of residence									**<.001**
North Central	8.1	35.6	3.5	17.7	5.1	5.2	18.7	6.1	
North East	17.8	31.5	3.9	19.0	8.9	5.1	8.0	5.9	
North West	8.6	32.6	3.1	30.3	11.1	4.7	2.6	6.9	
South East	18.9	41.6	2.5	4.6	10.7	4.6	11.0	6.2	
South South	15.0	29.1	4.3	13.9	10.3	6.0	14.3	7.0	
South West	15.2	35.8	3.0	10.9	11.5	3.6	11.0	9.1	
Age									**<.001**
15–24	14.1	26.7	4.7	10.7	7.5	6.6	21.2	8.6	
25–29	15.5	39.3	3.3	13.4	9.5	4.7	9.4	5.0	
30–34	16.5	41.5	2.9	11.6	10.4	4.0	8.2	4.9	
35–39	14.8	35.5	2.4	15.6	10.6	3.7	7.5	9.8	
40–49	9.1	22.0	3.4	21.4	12.6	5.5	14.9	11.1	
Number of living children									**<.001**
<4	13.5	37.3	3.4	11.4	9.6	4.8	13.7	6.4	
4	17.0	35.4	3.7	14.8	9.6	4.6	8.0	6.8	
5+	15.8	30.5	2.5	19.4	11.5	4.4	6.6	9.2	
Type of place of residence									**<.001**
Urban	15.6	36.1	2.9	12.6	11.0	4.2	10.8	6.9	
Rural	12.8	33.7	3.9	16.5	8.3	5.5	11.5	7.7	
Highest educational level									**<.001**
No education	12.9	34.2	4.1	21.2	9.8	3.4	4.6	9.8	
Primary	13.1	31.4	2.7	18.7	8.9	6.4	8.3	10.5	
Secondary	14.9	35.9	3.2	12.3	10.2	4.7	12.3	6.5	
Higher	16.0	37.1	3.1	10.5	10.8	4.1	13.5	4.9	
Wealth index									**<.001**
Poorest	11.2	38.4	4.7	17.5	7.2	5.7	6.7	8.6	
Poorer	13.3	37.7	4.0	12.8	8.3	3.8	8.7	11.4	
Middle	14.4	31.5	3.5	17.3	8.8	6.2	11.6	6.7	
Richer	13.7	32.2	3.2	13.8	10.8	5.3	13.8	7.2	
Richest	16.2	38.3	2.7	12.4	10.9	3.6	9.8	6.0	

Continued...

Table 2—*Continued*

	Reasons for contraceptive discontinuation								
	Became pregnant while using	Wanted to become pregnant	Husband disap-proved	Side effects	Wanted more effective method	Incon-venient use	Infre-quent sex/ husband away	Other	*p* value
Religion									**<.001**
Catholic	15.8	39.0	3.3	5.5	10.9	5.1	13.2	7.2	
Other Christian	15.7	34.7	2.6	12.9	10.4	4.9	12.4	6.5	
Islam	12.3	34.0	4.2	20.2	9.2	4.1	7.8	8.2	
Traditional/Other	3.8	60.7	6.6	5.5	9.0	6.7	0.0	7.8	
Respondent currently working									**<.05**
No	17.4	34.9	3.4	13.6	7.6	4.7	12.3	6.2	
Yes	13.9	35.3	3.2	14.1	10.7	4.7	10.7	7.4	
Getting medical help for self: getting permission to go									**>.05**
Big problem	11.8	37.3	5.0	14.0	8.0	6.6	10.9	6.4	
Not a big problem	14.8	35.1	3.1	14.0	10.2	4.6	11.0	7.2	
Getting medical help for self: getting money needed for treatment									**<.01**
Big problem	16.1	33.2	3.1	13.2	9.1	6.1	11.9	7.3	
Not a big problem	13.7	36.5	3.3	14.5	10.7	3.8	10.5	7.1	
Getting medical help for self: distance to health facility									**<.001**
Big problem	16.4	35.0	2.4	12.2	7.1	8.9	10.9	7.1	
Not a big problem	14.2	35.3	3.4	14.4	10.7	3.7	11.1	7.2	
Getting medical help for self: not wanting to go alone									**<.01**
Big problem	18.3	32.9	4.0	11.5	8.2	8.6	9.3	7.3	
Not a big problem	14.3	35.5	3.2	14.2	10.2	4.3	11.2	7.1	
Marital Status									**<.001**
Never in union	10.1	3.2	3.2	8.2	10.5	7.8	47.4	9.6	
Currently in a union	15.2	39.3	3.3	14.4	10.0	4.2	7.1	6.6	
Formerly in a union	11.6	16.7	2.9	16.4	10.7	8.3	21.0	12.3	

3.2.2 Reasons for contraceptive discontinuation by method type

Table 3 shows the reasons for contraceptive discontinuation by method type, at the national and sub-national levels. For the pill, the most frequent reason for discontinuation at the national level was that the women wanted to become pregnant. This was also found in all the sub-national regions. The least cited reason for discontinuation of the pill at the national level, and in the North Central, North West, and South West regions was the husband's disapproval. In the North East and South South, inconvenient use was the least cited reason for discontinuing the pill, while in the South East, the least cited reason was wanting a more effective method.

The most common reason cited for discontinuing injectables at the national level was side effects. This was also the case in all regions, except for the North Central, where the most cited reason for discontinuation

was wanting to become pregnant. The least cited reason for discontinuing injectables at the national level was inconvenient use, which was also the case in the South East Region, In the North Central and South South regions, husband's disapproval was the least cited reason, while in the North East and North West regions, infrequent sex or husband being away was the least cited reason for discontinuing injectables.

For the male condom, the most common reason for discontinuation at the national level and for all regions, except the North Central Region, were infrequent sex and husband's absence. Side effects were the least cited reason for discontinuation at the national level, and for all regions except the North East, which had other reasons as the least cited.

For the abstinence and rhythm methods, the most commonly cited reason at the national level and in all regions except the North East and North West was because women wanted to become pregnant. In the North East, the most commonly cited reason was that they became pregnant while using this method, and in the North West, the desire for a more effective method was the most cited reason for discontinuation. Husband's disapproval and side effects were jointly the least cited reasons for discontinuing this method at the national level and in the North East, South South, and South West regions. In the South East, inconvenient use was the least cited reason for discontinuation, the North Central Region which had husband's disapproval, side effects, and other reasons as the least cited, and the North West Region which had become pregnant, husband's disapproval, side effects, infrequent sex, and other as the least cited reasons.

Table 3 Reasons for discontinuation by contraceptive methods, by region

Reasons for discontinuation	Contraceptive methods												
	Pill	Injectable	Condom	Periodic abstinence/ rhythm	Withdrawal	Other traditional methods	Implant	LAM	EC	Other	Total	N	*p* value
National													**<.001**
Became pregnant while using	14.8	4.8	11.9	28.6	25.1	21.7	5.0	11.0	11.9	12.0	14.6	931	
Wanted to become pregnant	32.7	29.0	34.4	47.1	43.3	42.8	31.4	27.9	26.7	43.4	35.3	2,244	
Husband disapproved	2.4	4.2	7.4	0.1	3.0	0.6	2.2	0.6	7.3	3.8	3.2	206	
Side effects	21.7	37.3	1.5	0.1	0.5	7.8	42.9	0.6	15.1	15.5	14.0	890	
Wanted more effective method	10.1	8.4	7.7	6.0	9.4	6.0	3.6	25.6	6.2	6.8	10.1	641	
Inconvenient use	4.6	3.4	7.5	2.9	2.8	7.0	2.0	9.3	1.4	2.1	4.7	297	
Infrequent sex/ husband away	8.1	5.7	23.9	10.1	12.5	5.0	4.1	8.9	26.5	6.1	11.0	701	
Other	5.5	7.3	5.7	5.0	3.5	9.1	8.8	16.0	5.0	10.5	7.2	455	
Total												6,365	
North Central													**<.001**
Became pregnant while using	11.9	5.5	7.1	7.2	14.4	18.3	1.0	19.1	8.7	13.9	8.1	61	
Wanted to become pregnant	37.8	34.8	26.5	50.3	45.1	27.6	31.2	29.2	64.1	36.5	35.6	268	
Husband disapproved	1.4	3.4	7.1	0.0	5.1	5.0	0.8	0.0	0.0	4.3	3.5	26	
Side effects	16.7	28.9	0	0.0	0.0	15.3	44.1	7.5	5.8	16.6	17.7	133	
Wanted more effective method	6.5	5.1	2.9	2.2	8.2	5.3	3.4	18.9	0.0	7.3	5.1	39	
Inconvenient use	3.9	4.4	8.9	4.6	1.7	13.0	6.2	0.0	6.2	7.1	5.2	39	
Infrequent sex/ husband away	12.6	12.1	42.5	35.7	22.4	0.8	4.0	25.3	15.2	7.3	18.7	141	
Other	9.2	5.9	5.0	0.0	3.0	14.8	9.3	0.0	0.0	6.9	6.1	46	
Total												**751**	
North East													**<.001**
Became pregnant while using	12.2	3.6	2.3	55.9	10.9	17.6	17.3	6.6	0.0	28.0	17.8	126	
Wanted to become pregnant	36.1	25.6	11.9	23.9	44.6	36.7	29.4	52.3	6.3	29.4	31.5	222	
Husband disapproved	4.7	8.0	6.8	0.0	7.7	0.0	2.7	0.0	0.0	7.4	3.9	28	
Side effects	23.4	42.1	11.3	0.0	0.0	7.3	33.2	0.0	62.3	25.7	19.0	134	
Wanted more effective method	11.7	4.7	23.8	4.2	19.7	4.1	6.4	14.5	0.0	3.5	8.9	62	
Inconvenient use	2.4	4.9	20.3	4.6	11.2	10.1	0.0	2.7	0.0	3.0	5.1	36	
Infrequent sex/ husband away	4.5	2.3	23.6	8.8	3.9	9.3	4.2	16.0	31.4	3.0	8.0	56	
Other	4.9	8.8	0	2.6	2.0	14.9	6.8	7.9	0.0	0.0	5.9	41	
Total												**705**	

Continued...

Table 3—*Continued*

Reasons for discontinuation	Contraceptive methods												
	Pill	Injectable	Condom	Periodic abstinence/ rhythm	Withdrawal	Other traditional methods	Implant	LAM	EC	Other	Total	N	*p* value
North West													**<.001**
Became pregnant while using	11.8	5.2	5.8	0.0	53.3	19.1	1.2	21.6	0.0	15.9	8.6	67	
Wanted to become pregnant	33.7	29.5	37.3	36.2	34.2	42.9	31.5	32.4	0.0	52.5	32.6	255	
Husband disapproved	1.1	5.1	6.3	0.0	0.0	1.2	1.2	0.0	0.0	0.0	3.1	24	
Side effects	17.8	38.9	0.0.	0.0	0.0	4.9	55.0	0.0	0.0	26.4	30.3	237	
Wanted more effective method	16.0	10.4	10.2	46.7	6.7	12.8	1.0	46.1	0.0	0.0	11.1	87	
Inconvenient use	8.0	2.7	13.4	17.1	5.8	12.0	0.0	0.0	0.0	2.6	4.7	37	
Infrequent sex/ husband away	5.8	0.3	21.6	0.0	0.0	1.4	0.5	0.0	100.0	0.0	2.6	20	
Other	5.8	7.9	5.4	0.0	0.0	5.7	9.6	0.0	0.0	2.6	6.9	54	
Total												**781**	
South East													**<.001**
Became pregnant while using	20.8	5.4	12.3	21.1	32.4	3.0	2.3	10.7	0.0	0.0	18.9	270	
Wanted to become pregnant	33.4	29.1	37.5	54.8	44.0	54.1	47.2	30.1	62.7	58.4	41.6	596	
Husband disapproved	6.2	6.3	4.5	0.2	2.4	0.0	4.5	1.4	0.0	0.0	2.5	35	
Side effects	15.2	35.7	0.4	0.2	0.3	23.7	35.4	1.0	7.6	9.7	4.6	66	
Wanted more effective method	4.9	4.8	9.7	6.1	7.1	2.6	0.0	27.5	0.0	1.6	10.7	152	
Inconvenient use	5.4	4.6	5.9	0.0	0.3	0.0	3.9	15.1	0.0	1.6	4.6	66	
Infrequent sex/ husband away	8.7	5.6	23.8	9.9	9.6	10.0	2.8	6.6	24.8	11.8	11.0	157	
Other	5.4	8.4	5.9	7.8	3.8	6.5	3.9	7.5	4.9	16.8	6.2	89	
Total												**1,431**	
South South													**<.001**
Became pregnant while using	17.7	2.7	19.8	20.8	18.0	16.6	6.2	7.6	13.2	28.9	15.0	138	
Wanted to become pregnant	29.3	25.1	25.8	46.6	32.7	41.3	34.8	21.1	25.1	16.8	29.1	267	
Husband disapproved	2.4	0.3	8.4	0.0	6.3	0.0	5.7	0.4	8.4	0.0	4.3	39	
Side effects	28.7	46.6	1.7	0.0	0.0	11.0	27.3	1.4	10.6	3.1	13.9	127	
Wanted more effective method	7.2	6.0	5.9	10.1	15.7	9.5	10.6	20.8	11.6	18.9	10.3	95	
Inconvenient use	2.4	1.4	9.7	7.3	5.7	0.0	1.1	22.9	2.3	0.0	6.0	55	
Infrequent sex/ husband away	5.5	8.5	22.2	13.0	18.4	8.8	0.0	16.1	20.2	16.7	14.3	131	
Other	6.8	9.4	6.5	2.2	3.2	12.8	14.4	9.7	8.8	15.6	7.0	64	
Total												915	

Continued…

Table 3—*Continued*

Reasons for discontinuation	Contraceptive methods												
	Pill	Injectable	Condom	Periodic abstinence/ rhythm	Withdrawal	Other traditional methods	Implant	LAM	EC	Other	Total	N	*p* value
South West													**<.001**
Became pregnant while using	15.7	5.1	10.6	22.5	23.5	30.8	8.2	13.2	15.6	6.2	15.2	270	
Wanted to become pregnant	29.7	27.3	43.1	64.6	47.4	44.3	24.3	18.0	18.0	45.9	35.8	637	
Husband disapproved	1.6	1.9	9.1	0.0.	1.1	0.0	2.6	0.0	10.5	7.4	3.0	54	
Side effects	24.3	34.9	1.5	0.0	1.0	4.1	40.9	0.0	17.6	14.1	10.9	193	
Wanted more effective method	10.5	14.1	7.3	2.8	8.2	2.4	4.3	28.6	4.2	9.6	11.5	206	
Inconvenient use	4.6	2.9	4.8	4.8	3.5	5.6	0.6	3.4	0.0	0.7	3.6	65	
Infrequent sex/ husband away	10.9	8.8	17.4	1.4	11.6	4.4	10.9	6.7	31.1	2.9	11.0	196	
Other	2.7	4.9	6.1	3.9	3.8	8.3	8.2	30.0	3.0	13.2	9.1	161	
Total												1,782	

The most common reason for discontinuing withdrawal was that women wanted pregnancy, and this was seen at the national level, and in all the regions except the North West, where the most common reason for discontinuation was the woman becoming pregnant. The least cited reason for discontinuing this method was side effects at the national level and in all regions except the North West, which had husband's disapproval, side effects, infrequent sex, and other reasons jointly as the least cited reasons for discontinuation.

For traditional methods of contraception, at the national level and in all the regions, the most frequent reason for discontinuation was that women wanted to become pregnant. The least frequent reason was husband's disapproval at the national level and in all regions except the North Central, where it was infrequent sex or husband's absence.

The most frequent reason for discontinuing an implant was due to side effects at the national level, and in all regions except the South East, where wanting to become pregnant was the most cited reason. The least-mentioned reason for discontinuing this method was inconvenient use at the national level, North East and South West regions. In the North Central Region, husband's disapproval was the least cited method; in the South East Region, wanting a more effective method, and in the South South Region, infrequent sex or husband's absence were the least cited reasons for discontinuation of implant.

The most common reason for discontinuing the lactational amenorrhea method at the national level and in the North Central, North East, and South East was wanting to become pregnant. In the North West and South West, the major reason for discontinuation was that they wanted a more effective contraceptive method, while in the South South the reason was inconvenience of use. The least cited reasons nationally and in the North East and South West were jointly husband's disapproval and side effects. In the North Central Region, the least cited reasons were husband's disapproval and inconvenience; in the South East, it was side effects; and husband's disapproval in the South South. In the North West, the joint least cited

reasons were husband's disapproval, side effects, wanted more effective method, inconvenient use, and other reasons.

For emergency contraception, the most common reason given for discontinuation at the national level and in the North Central, South East and South South regions was wanting to become pregnant. In the North East and South West, side effects were the most cited reason, while it was infrequent sex or husband's absence in the North West Region. The least cited reasons at the national level and in the South South and South West regions were inconvenient use. In the North Central region, husband's disapproval, wanting a more effective method, and other reasons were the least cited. In the North East Region, becoming pregnant, husband's disapproval, wanting more effective methods, inconvenient use, and others were the least cited reasons. In the North West Region, becoming pregnant, wanting to become pregnant, husband's disapproval, side effects, wanting a more effective method, inconvenient use, and other reasons were jointly the least cited. In the South South, becoming pregnant, husband's disapproval, side effects, and inconvenient use were jointly the least cited reasons for contraceptive discontinuation.

For other contraceptive methods, at the national level and all regions except the South South, wanting to become pregnant was the major reason for discontinuing contraceptives. In the South South, the major reason for discontinuing these methods was becoming pregnant while using them. The least cited reason for discontinuation at the national level and the South West Region was inconvenient use. In the North Central, husband's disapproval was the least cited, and other reasons was the least cited in the North East. In the North West, husband's disapproval, wanting more effective methods, and infrequent sex were jointly the least cited. In the South East, becoming pregnant and husband's disapproval were jointly the least cited, and in the South South, husband's disapproval and inconvenient use were least cited.

3.3 Contraceptive Discontinuation Rates by Reason and Method

Table 4 shows the 12-month contraceptive discontinuation rates for the national and sub-national levels, by reasons for discontinuation and method. Discontinuation rates with less than 125 unweighted cases have been suppressed, and those with less than 250 cases are in parentheses and should be interpreted with caution. At the national level, the desire to become pregnant caused the highest discontinuation rates for the pill (14.5%), IUDs (6.4%), periodic abstinence (16.2%), withdrawal (15.8%), and other methods (15.9%). The highest discontinuation rates for injectables (22.7%) and implants (8.9%) were due to side effects. The LAM was mainly discontinued for the need for a more effective method whereas male condom was for other fertility-related reasons. For all methods, the highest discontinuation rates (12.7%) were due to the women desiring to become pregnant. The discontinuation rate for all methods and reasons was 40.6%; LAM had the highest discontinuation rates for all reasons (55.7 %), pill (52.3%), and injectables (54.7%), and the least was IUD (15.5%). There are variations across the six regions.

In the North Central Region, the highest discontinuation rates for the pill (20.0%), periodic abstinence (24%), and withdrawal (16.3%) were due to the desire to become pregnant. The highest discontinuation rates for injectables (18.1%) and implants (8.6%) were due to side effects. For male condoms (23.8%), the highest discontinuation rates were due to other fertility-related issues. The discontinuation rate for all methods and reasons was greater than the national rate. Similar to the pattern in the country, the highest discontinuation rate for all methods was due to the desire to become pregnant. The pill and injectables had the highest discontinuation rates for all reasons.

In the North East Region, the highest discontinuation rate for the pill (16.1%) was due to the desire to become pregnant. For injectables (25.4%), and implants (10.4%), the highest discontinuation rates were due to side effects. The highest discontinuation rate for LAM was due to the need for more effective methods (5.7%). For periodic abstinence, the highest discontinuation rate was due to method failure (15.7%). For all methods and reasons, the discontinuation rate in this region was 1.9 points lower than the national rate. In contrast with the national level, the highest discontinuation rate was because of side effects. The pill, injectables, and withdrawal had the highest discontinuation rates for all reasons.

In the North West Region, for the pill (18.8%) and other methods (26.6%), the highest discontinuation rates were due to the desire to become pregnant. For injectables and implants, the highest discontinuation rates were due to side effects (27.9% and 12.7%, respectively). For all methods, the highest discontinuation rate was due to side effects (17.3%), which was similar to the North East Region. Injectables, pill, other methods, and withdrawal had the highest discontinuation rate for all reasons.

In the South East Region, the desire to become pregnant was responsible for the highest discontinuation rates with male condom (14.4%), periodic abstinence (24.3%), pill (21.1%), withdrawal (26.5%), and LAM (26.5%). The highest discontinuation rates for injectables (21.9%) was due to side effects. The overall discontinuation rate in this region for all methods and reasons was 48.8%. Similar to the pattern in the country, the highest discontinuation rate was due to the desire to become pregnant (20.2%). The LAM had the highest discontinuation rate for all reasons.

In the South South Region, the highest discontinuation rates for the pill (13.5%), injectables (22.6%), and implant (2.5%) were due to side effects. For the male condom, the highest rate of discontinuation was due to the desire to become pregnant (10.5%); and withdrawal (14.4%). The highest discontinuation rate for LAM was due to other method-related reasons. For all methods, the discontinuation rate was 3.4 points lower than the national rate, and the highest rate of discontinuation was due to the desire to become pregnant (10.9%), while for all reasons, the highest discontinuation rates were for LAM.

In the South West, the highest discontinuation rates for the pill (12.7%), injectables (19.4%), and implants (6.5%) were due to side effects. For the male condom (8.9%), and withdrawal (11.4%), the highest discontinuation rates were due to the desire to become pregnant, and for LAM it was because of the need for a more effective method. For all methods and reasons, the discontinuation rate in this region was the lowest (32.5%), and the highest discontinuation rate was due to the desire to become pregnant (9.2%), which was similar to the country rate. The highest discontinuation rates for all reasons were for injectables and LAM.

Table 4 Discontinuation rates by reasons and methods

	Reasons for discontinuation									
	Method failure	Desire to become pregnant	Other fertility related reasons	Side effects/ health concerns	Wanted more effective method	Other method related	Other/ Don't know	All reasons	Weighted N	Unweighted N
National										
Pill	7.3 [5.8, 9.0]	14.5 [12.4, 16.8]	4.8 [3.6, 6.3]	13.4 [11.4, 15.5]	6.2 [4.8, 7.8]	4.7 [3.5, 6.1]	1.4 [0.8, 2.3]	52.3 [42.3, 63.7]	1,141.23	1,025
Injectables	2.4 [1.8, 3.3]	13.4 [11.8, 15.2]	5.3 [4.3, 6.5]	22.7 [20.7, 24.8]	4.9 [3.9, 6.0]	4.1 [3.2, 5.1]	1.9 [1.3, 2.6]	54.7 [47.0, 63.5]	1,916.06	1,830
Implants	1.1 [0.6, 2.0]	3.8 [2.7, 5.1]	0.8 [0.3, 1.5]	8.9 [7.2, 10.7]	0.4 [0.1, 1.0]	0.3 [0.1, 0.8]	0.4 [0.1, 1.0]	15.7 [11.2, 22.1]	1,240.69	1,183
Male condom	4.3 [3.3, 5.5]	10.2 [8.6, 11.9]	12.0 [10.3, 13.8]	0.9 [0.5, 1.5]	2.8 [2.0, 3.7]	3.5 [2.7, 4.6]	1.2 [0.8, 1.9]	34.9 [28.1, 42.9]	1,604.87	1,460
IUD	(2.1) [0.8, 4.6]	(6.4) [3.8, 10.0]	(1.1) [0.3, 3.2]	(3.7) [1.8, 6.7]	(1.6) [0.5, 3.9]	(0.2) [0.0, 1.9]	(0.3) [0.0, 2.1]	(15.5) [7.3, 32.4]	276.34	230
Periodic abstinence	9.6 [7.6, 11.8]	16.2 [13.7, 19.0]	2.7 [1.7, 4.0]	0.1 [0.0, 0.7]	2.0 [1.2, 3.3]	1.1 [0.5, 2.1]	1.1 [0.5, 2.0]	32.8 [25.2, 42.9]	845.45	781
Withdrawal	10.5 [8.9, 12.1]	15.8 [13.9, 17.8]	6.1 [4.9, 7.4]	0.1 [0.0, 0.4]	3.5 [2.6, 4.6]	1.4 [0.9, 2.1]	1.1 [0.7, 1.8]	38.5 [32.0, 46.2]	1,646.13	1,371
LAM	5.3 [3.9, 7.0]	14.6 [12.3, 17.1]	4.7 [3.4, 6.3]	0.4 [0.1, 1.0]	16.0 [13.6, 18.5]	7.0 [5.4, 8.8]	7.7 [6.0, 9.6]	55.7 [44.8, 68.4]	1,029.02	893
Other	6.7 [4.8, 8.9]	15.8 [13.0, 19.0]	5.7 [4.1, 7.8]	4.6 [3.1, 6.6]	2.7 [1.6, 4.2]	3.3 [2.1, 5.0]	2.1 [1.2, 3.5]	41.0 [29.8, 54.9]	683.77	535
All methods	5.6 [5.1, 6.1]	12.7 [12.0, 13.4]	5.5 [5.0, 6.0]	7.2 [6.7, 7.8]	4.6 [4.2, 5.0]	3.1 [2.7, 3.5]	1.9 [1.6, 2.2]	40.6 [37.4, 44.0]	10,383.56	9,308
North Central										
Pill	(7.7) [4.1, 12.9]	(20.0) [13.5, 27.3]	(8.3) [4.4, 13.7]	(11.3) [6.8, 17.2]	(2.5) [0.7, 6.2]	(6.7) [3.3, 11.8]	(0.8) [0.1, 3.9]	(57.3) [32.8, 93.0]	154.47	202
Injectables	3.0 [1.5, 5.3]	15.9 [12.2, 20.0]	7.3 [4.9, 10.4]	18.0 [14.1, 22.3]	2.4 [1.1, 4.5]	3.8 [2.1, 6.2]	1.6 [0.7, 3.5]	52.1 [36.7, 72.3]	386.29	495
Implants	0.4 [0.0, 2.5]	6.3 [3.5, 10.3]	0.6 [0.1, 2.7]	8.6 [5.3, 12.9]	0.6 [0.1, 2.7]	1.0 [0.2, 3.0]	0.6 [0.1, 2.7]	18.1 [9.3, 36.8]	252.23	304
Male condom	2.8 [1.1, 5.9]	9.4 [5.7, 14.0]	23.8 [18.1, 30.0]	0	1.7 [0.5, 4.3]	4.5 [2.2, 8.1]	1.7 [0.5, 4.2]	43.8 [28.1, 66.5]	231.05	308
IUD	*	*	*	*	*	*	*	*	33.97	46
Periodic abstinence	*	*	*	*	*	*	*	*	40.76	54
Withdrawal	(4.5) [1.7, 9.2]	(16.3) [10.3, 23.6]	(12.5) [7.3, 19.2]	0	(3.9) [1.3, 8.7]	(0.6) [0.0, 4.0]	(1.1) [0.1, 4.5]	(38.9) [20.8, 69.2]	130.57	172
LAM	*	*	*	*	*	*	*	*	17.97	24
Other	*	*	*	*	*	*	*	*	57.13	74
All methods	3.3 [2.4, 4.4]	13.3 [11.3, 15.4]	10.1 [8.4, 11.9]	8.6 [7.0, 10.3]	2.2 [1.5, 3.2]	3.1 [2.2, 4.2]	1.4 [0.8, 2.2]	41.9 [33.6, 51.7]	1,304.45	1,679
North East										
Pill	(8.9) [4.9, 14.4]	(16.1) [10.5, 22.7]	(4.6) [1.9, 9.1]	(14.3) [9.0, 20.7]	(7.9) [4.2, 13.2]	(3.8) [1.5, 8.0]	(1.3) [0.2, 4.4]	(56.9) [32.2, 92.4]	155.83	172
Injectables	1.3 [0.4, 3.4]	12.6 [8.8, 17.1]	7.2 [4.4, 10.9]	25.3 [20.1, 30.9]	2.7 [1.2, 5.3]	4.5 [2.4, 7.6]	3.2 [1.5, 5.9]	56.8 [38.7, 81.1]	282.12	320
Implants	(6.4) [2.7, 12.2]	(6.0) [2.4, 12.1]	(1.1) [0.1, 4.8]	(10.4) [5.3, 17.3]	(1.8) [0.3, 5.7]	0	0	(25.6) [10.9, 52.1]	128.51	159
Male condom	*	*	*	*	*	*	*	*	71.38	79
IUD	*	*	*	*	*	*	*	*	10.05	10
Periodic abstinence	(15.7) [10.6, 21.7]	(2.8) [1.0, 6.2]	(1.7) [0.4, 4.6]	0	(1.6) [0.4, 4.5]	(3.5) [1.4, 7.1]	(0.6) [0.0, 2.9]	(25.8) [13.9, 47.0]	184.26	204
Withdrawal	*	*	*	*	*	*	*	*	52.33	47
LAM	0	4.0 [1.6, 8.4]	4.4 [1.8, 8.8]	0	5.7 [2.8, 10.1]	1.8 [0.5, 4.9]	1.6 [0.4, 4.9]	17.6 [7.0, 37.1]	184.87	256
Other	*	*	*	*	*	*	*	*	76.02	75
All methods	6.1 [4.7, 7.7]	8.3 [6.7, 10.2]	5.0 [3.8, 6.5]	10.0 [8.2, 11.9]	4.0 [2.9, 5.4]	3.7 [2.7, 5.0]	1.6 [0.9, 2.5]	38.7 [29.9, 49.2]	1,145.37	1,322

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Table 4—*Continued*

	Reasons for discontinuation									
	Method failure	Desire to become pregnant	Other fertility related reasons	Side effects/ health concerns	Wanted more effective method	Other method related	Other/ Don't know	All reasons	Weighted N	Unweighted N
North West										
Pill	(7.6) [4.4, 11.9]	(18.8) [13.7, 24.6]	(4.8) [2.4, 8.3]	(14.7) [10.3, 20.0]	(12.6) [8.4, 17.7]	(6.2) [3.5, 10.2]	(2.0) [0.7, 4.6]	(66.7) [43.3, 97.3]	228.42	176
Injectables	3.8 [2.3, 6.0]	17.7 [14.1, 21.6]	4.6 [2.9, 6.9]	27.9 [23.7, 32.2]	7.6 [5.3, 10.4]	4.6 [2.9, 6.9]	2.3 [1.2, 4.0]	68.5 [52.4, 88.0]	526.83	410
Implants	0	(2.9) [1.3, 5.5]	0	(12.7) [9.1, 17.0]	(0.4) [0.0, 2.0]	0	(0.4) [0.0, 2.3]	(16.4) [10.5, 26.8]	332.62	236
Male condom	*	*	*	*	*	*	*	*	37.49	29
IUD	*	*	*	*	*	*	*	*	39.48	25
Periodic abstinence	*	*	*	*	*	*	*	*	15.97	10
Withdrawal	*	*	*	*	*	*	*	*	20.10	16
LAM	*	*	*	*	*	*	*	*	22.98	18
Other	*	*	*	*	*	*	*	*	105.78	82
All methods	4.7 [3.5, 6.1]	13.8 [11.8, 16.0]	3.3 [2.3, 4.4]	17.3 [15.1, 19.6]	5.9 [4.6, 7.4]	3.8 [2.8, 5.1]	1.3 [0.8, 2.2]	50.1 [41.0, 60.7]	1,329.66	1,002
South East										
Pill	*	*	*	*	*	*	*	*	98.82	103
Injectables	(2.9) [0.8, 7.7]	8.3 [3.9, 14.8]	(0.5) [0.0, 4.3]	(21.9) [14.4, 30.4]	(2.4) [0.5, 7.0]	(5.0) [1.9, 10.5]	(1.1) [0.1, 5.0]	(42.2) [21.6, 79.6]	117.09	136
Implants	*	*	*	*	*	*	*	*	104.74	110
Male condom	5.9 [3.5, 9.2]	14.4 [10.5, 18.9]	9.4 [6.4, 13.2]	0.3 [0.0, 1.7]	3.9 [2.0, 6.7]	3.0 [1.4, 5.4]	1.9 [0.7, 4.2]	38.8 [24.6, 59.3]	330.89	339
IUD	*	*	*	*	*	*	*	*	42.40	32
Periodic abstinence	10.0 [7.1, 13.4]	24.3 [19.8, 29.0]	1.5 [0.6, 3.3]	0.2 [0.0, 1.5]	2.4 [1.2, 4.4]	0	1.5 [0.6, 3.2]	39.9 [29.2, 54.9]	393.64	347
Withdrawal	15.5 [12.5, 18.7]	20.8 [17.4, 24.5]	5.4 [3.7, 7.6]	0	3.9 [2.5, 5.9]	0	1.1 [0.5, 2.3]	46.7 [36.5, 59.1]	599.51	563
LAM	5.2 [3.0, 8.2]	26.5 [21.5, 31.6]	6.0 [3.7, 9.0]	0.7 [0.1, 2.2]	24.6 [19.9, 29.6]	15.0 [11.3, 19.2]	5.9 [3.6, 8.9]	83.8 [63.2, 108.7]	345.54	327
Other	*	*	*	*	*	*	*	*	49.87	49
All methods	8.8 [7.5, 10.2]	20.2 [18.4, 22.2]	4.7 [3.8, 5.7]	2.7 [2.0, 3.5]	6.7 [5.6, 7.9]	3.7 [2.9, 4.6]	2.0 [1.5, 2.8]	48.8 [41.6, 56.8]	2,082.51	2,006
South South										
Pill	(9.6) [5.8, 14.4]	(13.3) [8.9, 18.7]	(3.3) [1.4, 6.5]	(13.5) [9.1, 18.8]	(3.3) [1.4, 6.7]	(3.8) [1.7, 7.3]	(1.6) [0.4, 4.2]	(48.4) [28.7, 76.6]	208.64	182
Injectables	(1.3) [0.3, 3.9]	(9.0) [5.3, 13.8]	(2.8) [1.1, 5.9]	(22.6) [16.8, 28.8]	(3.3) [1.4, 6.7]	(1.6) [0.5, 4.3]	(3.1) [1.2, 6.4]	(43.6) [26.6, 69.8]	214.86	191
Implants	(1.4) [0.2, 4.8]	(2.1) [0.4, 6.5]	(1.1) [0.1, 5.0]	(2.5) [0.6, 7.1]	(0.2) [0.0, 3.3]	(0.3) [0.0, 3.6]	(1.4) [0.3, 4.6]	(9.0) [1.6, 35.0]	139.11	142
Male condom	5.4 [3.3, 8.3]	10.5 [7.5, 14.1]	6.8 [4.5, 9.8]	0.8 [0.2, 2.5]	2.2 [1.0, 4.2]	4.4 [2.6, 6.9]	0.6 [0.1, 1.9]	30.7 [19.2, 47.7]	400.44	319
IUD	*	*	*	*	*	*	*	*	9.51	8
Periodic abstinence	*	*	*	*	*	*	*	*	104.33	91
Withdrawal	(6.2) [3.5, 9.9]	(14.4) [10.0, 19.5]	(11.8) [7.9, 16.5]	0	(6.4) [3.6, 10.1]	(2.2) [0.8, 5.0]	(0.5) [0.0, 2.2]	(41.4) [25.9, 63.3]	261.73	194
LAM	*	*	*	*	*	*	*	*	94.47	81
Other	*	*	*	*	*	*	*	*	138.47	100
All methods	5.5 [4.3, 6.8]	10.9 [9.2, 12.7]	6.0 [4.8, 7.3]	6.2 [5.0, 7.6]	3.9 [3.0, 5.1]	3.2 [2.4, 4.3]	1.5 [1.0, 2.3]	37.2 [29.7, 46.0]	1,571.57	1,308

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Table 4—*Continued*

	Reasons for discontinuation									
	Method failure	Desire to become pregnant	Other fertility related reasons	Side effects/ health concerns	Wanted more effective method	Other method related	Other/ Don't know	All reasons	Weighted N	Unweighted N
South West										
Pill	(3.8) [2.0, 6.5]	(6.8) [4.2, 10.2]	(4.6) [2.5, 7.5]	(12.7) [9.1, 16.9]	(5.3) [3.1, 8.4]	(3.3) [1.6, 5.9]	(1.2) [0.4, 3.2]	37.73272	295.03	190
Injectables	1.3 [0.5, 3.1]	10.4 [7.4, 14.0]	5.6 [3.5, 8.5]	19.4 [15.3, 23.8]	7.2 [4.7, 10.4]	4.5 [2.7, 7.2]	0.3 [0.0, 1.5]	48.7 [34.0, 68.5]	388.87	278
Implants	(1.1) [0.2, 3.5]	(2.1) [0.7, 4.7]	(0.8) [0.1, 2.8]	(6.5) [3.8, 10.3]	0	0	0	(10.5) [4.9, 21.4]	283.48	232
Male condom	3.6 [2.2, 5.7]	8.9 [6.5, 11.9]	11.9 [9.2, 15.0]	1.0 [0.4, 2.3]	2.2 [1.1, 3.9]	2.8 [1.5, 4.6]	1.4 [0.6, 2.8]	31.9 [21.6, 46.2]	533.62	386
IUD	*	*	*	*	*	*	*	*	140.93	109
Periodic abstinence	*	*	*	*	*	*	*	*	106.49	75
Withdrawal	7.7 [5.6, 10.3]	11.4 [8.7, 14.3]	2.8 [1.6, 4.5]	0.3 [0.1, 1.2]	1.5 [0.7, 2.9]	1.8 [0.9, 3.2]	1.5 [0.7, 3.0]	27.0 [18.3, 39.4]	581.89	379
LAM	(7.7) [5.1, 11.0]	(9.4) [6.4, 13.0]	(2.0) [0.8, 4.0]	0	(14.0) [10.1, 17.8]	(0.5) [0.1, 2.0]	(13.3) [9.7, 17.4]	(46.5) [32.2, 65.2]	363.18	187
Other	(7.4) [4.4, 11.3]	(12.2) [8.3, 16.9]	(7.0) [4.2, 10.8]	(4.1) [2.1, 7.1]	(1.9) [0.7, 4.5]	(1.6) [0.5, 3.9]	(0.4) [0.0, 2.2]	(34.5) [20.1, 56.7]	256.51	155
All methods	4.6 [3.8, 5.5]	9.2 [8.1, 10.4]	5.0 [4.2, 5.9]	5.1 [4.3, 6.0]	4.1 [3.4, 5.0]	2.0 [1.5, 2.6]	2.6 [2.0, 3.2]	32.5 [27.3, 38.5]	2,950.00	1,991

Note: Figures in parentheses represent rates where the unweighted number of discontinuation episodes is <250. Asterisks are used to represent suppressed figures where the unweighted number of discontinuation episodes is <125.

3.4 Determinants of Contraceptive Discontinuation

Table 5 shows the results of the Cox proportional hazards regression that estimated the determinants of contraceptive discontinuation. Compared to the South West Region, the risk of discontinuation was significantly higher in all the regions except the South South Region. At the national level, injectables had 3.2 times risk of being discontinued, compared with IUD (the reference group—which has the lowest discontinuation rate) (aHR: 3.2). Similarly, in the North Central, North West, South East, and South West regions, injectables had a higher risk of discontinuation compared to IUD (aHRs: 3.4; 2.7; 3.0; and 3.8 respectively). In the North West, there was a 40% lower risk of discontinuation of implants, compared to IUDs (aHR: 0.6). At the national level, the pill had 3.1 times the risk of being discontinued compared to IUDs (aHR: 3.1). There was also higher risk of discontinuing the pill in the North Central, North West, South East, South South and South West regions (aHRs: 4.0; 2.5; 3.7; 4.4, and 2.6 respectively).

The male condom had 2.5 times the risk of being discontinued compared with IUDs at the national level (aHR: 2.5). At the sub-national level, discontinuation of the male condom was 2.7 times more likely in the North Central Region (aHR:2.7); 2.8 times more likely in the South East Region (aHR: 2.8), and 2.9 times more likely in the South West Region (aHR: 2.9). Periodic abstinence had 2.2 times higher risk of discontinuation than IUD at the national level (aHR 2.2). At the sub-national level, periodic abstinence was 3.2 times more likely to be discontinued in the North Central Region (aHR: 3.2); 2.4 times more likely to be discontinued in the South East Region (aHR: 2.4), and 1.8 times more likely to be discontinued in the South West Region (aHR: 1.8). Withdrawal had 2.5 times the risk of being discontinued at the national level (aHR: 2.5). At the sub-national level, withdrawal was 2.8 times more likely to be discontinued in the North Central (aHR: 2.8), 2.2 times more likely to be discontinued in the North West (aHR: 2.2); and 2.6 times more likely to be discontinued in the South East and South West regions (aHR: 2.6). LAM had 2.9 times the risk of being discontinued at the national level (aHR:2.9). At the sub-national level, this method had 4.6 times the risk of being discontinued compared to IUD in the South East (aHR: 4.6), 5.3 times the risk in the South South (aHR: 5.3) and 3 times the risk in the South West (aHR: 3.0). At the national level, other methods had 2.7 times the risk of being discontinued compared to IUDs (aHR:2.7). At the sub-national level, other methods had 3.1 times the risk of discontinuation compared with IUDs in the North Central (aHR: 3.1); 2 times the risk of being discontinued in the North West (aHR: 2.0); 3.4 times the risk in the South East (aHR: 3.4), 5.4 times the risk in the South South (aHR: 5.4), and 2.8 times the risk of discontinuation in the South West (aHR: 2.8).

The risk of contraceptive discontinuation decreased with age, particularly from age 30 to 49 compared to age 15 to 24. At the national level, women age 30–34 had a 10% lower risk of discontinuing contraceptives compared to those age 15 to 24 (aHR: 0.9). In the South West, women age 30 to 34 had a 30% lower risk of discontinuation compared to those age 15 to 24 (aHR: 0.7). At the national level, women age 35 to 39 were 40% less likely to discontinue contraceptives (aHR: 0.6). In the North Central and North West, women age 35 to 39 were 30% less likely to discontinue contraceptives (aHR: 0.7); in the South East, they were 40% less likely to discontinue (aHR: 0.6); and in the South West, they were 60% less likely to discontinue contraception compared to women age 15 to 24 (aHR: 0.4). At the national level, women age 40 to 49 had 60% lower risk of contraceptive discontinuation (aHR: 0.4). In the North Central. women age 40 to 49 were 50% less likely to discontinue contraceptives compared to those age 15 to 24 (aHR: 0.5); in the North East and South South, they were 40% less likely to discontinue contraceptives (aHR: 0.6); in the North West

they were 70% less likely to discontinue contraceptives (aHR: 0.3); and in the South East and South West they had 60% lower risk of discontinuation (aHR: 0.4).

At the national level, women in a marital union and those who were formerly in a union had 2.5 and 2.4 times the risk of contraceptive discontinuation, respectively, compared to women who have never been in a union. In the North West, married women had 2.4 the risk of discontinuation compared to those who had never been in union (aHR: 2.4); in the South East, they had 3.3 times the risk of discontinuation (aHR: 3.3); in the South South they had 3.3 times the risk (aHR: 3.3); and in the South West they had 2.2 times the risk of discontinuation compared with those who were never married (aHR: 2.2). In the North West, women formerly in union had 2.9 times the risk of discontinuation (aHR: 2.9); in the South East, South South and South West they had 2.8, 2.0 and 2.5 times the risk of discontinuation compared to those who had never been married respectively (aHR: 2.8; 2.0; 2.5).

At the national level, education was not significantly associated with contraceptive discontinuation. In the North Central Region, however, women with primary education had a higher risk of contraceptive discontinuation compared with those with no education (aHR: 1.3). In the North East, women with higher education had 30% lower risk of contraceptive discontinuation compared with those with no education (aHR: 0.7). In the South South Region, however, women with higher education had 2.3 times the risk of: discontinuation compared with those with no education (aHR: 2.3). Also, at the national level, religion was not associated with contraceptive discontinuation. In North East and South West regions, women in the "other Christian" category had 50% and 40% lower risk of contraceptive discontinuation, respectively, compared with Catholic women (aHRs: 0.5; 0.6). Muslim women in the South East Region had 1.6 times the risk of discontinuation (aHR: 1.6), while those in the South West Region had 40% lower risk of discontinuation compared to Catholic women (aHR: 0.6).

Working women had 10% lower risk of discontinuing contraceptives compared with non-working women nationally (aHR: 0.9). In the North Central and South East, working women had a 30% and 20% lower risk of discontinuation, respectively, compared with those who were not working (aHR: 0.7; 0.8). Yoruba women had 20% lower risk of contraceptive discontinuation compared with the Hausa and Fulani women (aHR: 0.8). While obtaining money for treatment was not associated with contraceptive discontinuation at the national level, in the North Central Region, women who did not think it was a big problem had 20% lower risk of discontinuation compared with those who thought it was a big problem (aHR: 0.8). In the North East, those who didn't have a big problem obtaining money had 1.4 times the risk of discontinuation (aHR: 1.4). While the distance to the health facility was not significantly associated with contraceptive discontinuation at the national level, women who did not have a problem with the distance had a 30% lower risk of discontinuation in the North East Region, compared with those who thought the distance was a big problem (aHR: 0.7). Women who reported that going alone to a health facility was not a big problem had 1.2 times the risk of contraceptive discontinuation compared with women who reported a big problem at the national level (aHR: 1.2). At the sub-national level, in the North East and South South regions, women who did not have a big problem with going alone to the health facility had 1.5 times the risk of contraceptive discontinuation, compared to women who said they had a big problem with it (aHR: 1.5).

Education, religion, place of residence, obtaining permission to go to the health facility, finding money needed for treatment, and distance to the health facility did not have any significant relationship with the risk of contraceptive discontinuation at the national level, and in the majority of the regions.

Table 5 Cox proportional hazards regression for the determinants of contraceptive discontinuation

	Nigeria		North Central		North East		North West		South East		South South		South West	
Variables	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**
Region														
South West (ref)														
North Central	1.4***	[1.2, 1.7]												
North East	1.3*	[1.0, 1.5]												
North West	1.4**	[1.1, 1.7]												
South East	1.5***	[1.2, 1.9]												
South South	1.1	[0.9, 1.3]												
Contraceptive method discontinued														
IUD (Ref)														
Injectables	3.2***	[2.5, 4.1]	3.4***	[1.9, 6.3]	1.4	[0.6, 3.1]	2.7***	[1.8, 4.1]	3.0***	[1.8, 4.9]	4.2	[1.0, 17.5]	3.8***	[2.3, 6.5]
Implant	0.8	[0.6, 1.1]	1.1	[0.6, 2.1]	0.5	[0.2, 1.2]	0.6*	[0.4, 0.9]	0.8	[0.4, 1.6]	1.0	[0.2, 4.1]	1.0	[0.6, 1.8]
Pill	3.1***	[2.4, 4.0]	4.0***	[2.1, 7.6]	1.3	[0.6, 2.9]	2.5***	[1.6, 4.0]	3.7***	[2.0, 6.6]	4.4*	[1.1, 18.2]	2.6***	[1.5, 4.5]
Male condom	2.5***	[1.9, 3.2]	2.7**	[1.4, 5.0]	1.0	[0.4, 2.4]	1.8	[0.8, 4.1]	2.8***	[1.7, 4.8]	3.3	[0.8, 13.6]	2.9***	[1.8, 4.8]
Periodic abstinence	2.2***	[1.7, 2.8]	3.2***	[1.7, 6.0]	1.3	[0.6, 2.9]	1.2	[0.5, 3.1]	2.4**	[1.4, 4.2]	2.4	[0.6, 10.0]	1.8*	[1.0, 3.2]
Withdrawal	2.5***	[1.9, 3.2]	2.8**	[1.5, 5.3]	1.0	[0.4, 2.5]	2.2*	[1.1, 4.4]	2.6***	[1.6, 4.4]	4.0	[0.9, 17.4]	2.6***	[1.6, 4.3]
LAM	2.9***	[2.2, 3.7]	1.9	[0.7, 5.5]	0.8	[0.4, 2.0]	0.8	[0.2, 2.9]	4.6***	[2.8, 7.4]	5.3*	[1.2, 22.9]	3.0***	[1.9, 5.1]
Other	2.7***	[2.0, 3.5]	3.1**	[1.6, 6.3]	0.8	[0.3, 1.9]	2.0**	[1.2, 3.3]	3.4*	[1.3, 9.0]	5.4*	[1.3, 23.0]	2.8***	[1.8, 5.0]
Age														
15–24 (Ref)														
25–29	1.1	[1.0, 1.2]	1.1	[0.8, 1.3]	1.2	[1.0, 1.6]	1.0	[0.7, 1.3]	1.1	[0.9, 1.4]	1.1	[0.8, 1.4]	0.8	[0.6, 1.0]
30–34	0.9*	[0.8, 1.0]	0.9	[0.7, 1.2]	1.1	[0.8, 1.4]	0.9	[0.6, 1.2]	0.9	[0.8, 1.1]	1.0	[0.7, 1.3]	0.7**	[0.5, 0.8]
35–39	0.6***	[0.6, 0.7]	0.7**	[0.5, 0.8]	0.9	[0.6, 1.2]	0.7*	[0.5, 0.9]	0.6***	[0.5, 0.7]	0.7	[0.5, 1.1]	0.4***	[0.3, 0.6]
40–49	0.4***	[0.4, 0.5]	0.5***	[0.3, 0.7]	0.6**	[0.5, 0.9]	0.3***	[0.2, 0.5]	0.4***	[0.3, 0.6]	0.6*	[0.4, 0.9]	0.4***	[0.3, 0.5]
Marital Status														
Never married (Ref)														
In a union	2.5***	[2.0, 3.0]	1.3	[0.9, 1.9]	1.8	[1.0, 3.2]	2.4*	[1.2, 5.0]	3.3***	[2.3, 4.7]	3.1***	[2.1, 4.6]	2.2***	[1.4, 3.4]
Formerly in a union	2.4***	[1.9, 3.1]	1.4	[0.9, 2.3]	1.8	[0.9, 3.5]	2.9*	[1.2, 7.5]	2.8***	[1.7, 4.5]	2.0**	[1.2, 3.4]	2.5**	[1.4, 4.4]

Continued…

Table 5—*Continued*

Variables	Nigeria		North Central		North East		North West		South East		South South		South West	
	Adjusted Hazard Ratios (aHR)	95% CI	Adjusted Hazard Ratios (aHR)	95% CI	Adjusted Hazard Ratios (aHR)	95% CI	Adjusted Hazard Ratios (aHR)	95% CI	Adjusted Hazard Ratios (aHR)	95% CI	Adjusted Hazard Ratios (aHR)	95% CI	Adjusted Hazard Ratios (aHR)	95% CI
Place of residence														
Urban (Ref)														
Rural	1.0	[0.9, 1.1]	1.0	[0.8, 1.2]	0.9	[0.8, 1.3]	1.0	[0.7, 1.3]	1.0	[0.9, 1.2]	1.0	[0.8, 1.2]	0.9	[0.7, 1.2]
Highest level of education														
No education (ref)														
Primary	1.0	[0.9, 1.1]	1.3*	[1.0, 1.7]	1.0	[0.8, 1.3]	0.9	[0.7, 1.2]	1.0	[0.3, 3.0]	1.6	[0.7, 3.5]	0.8	[0.5, 1.2]
Secondary	1.1	[0.9, 1.2]	1.3	[1.0, 1.6]	1.0	[0.8, 1.3]	1.0	[0.8, 1.4]	0.9	[0.3, 3.0]	2.0	[1.0, 4.3]	1.0	[0.7, 1.4]
Higher	1.1	[0.9, 1.2]	1.3	[0.9, 1.7]	0.7*	[0.5, 1.0]	0.9	[0.6, 1.3]	0.9	[0.3, 3.0]	2.3*	[1.1, 4.9]	1.0	[0.7, 1.5]
Religion														
Catholic (ref)														
Other Christian	1.0	[0.9, 1.1]	1.0	[0.8, 1.3]	0.5**	[0.4, 0.8]	1.2	[0.6, 2.5]	1.0	[0.9, 1.2]	0.8	[0.6, 1.0]	0.6*	[0.4, 0.9]
Islam	1.1	[0.9, 1.2]	1.0	[0.8, 1.4]	0.9	[0.6, 1.3]	1.6	[1.0, 2.8]	1.6**	[1.2, 2.2]	0.9	[0.6, 1.4]	0.6*	[0.4, 0.9]
Work status														
Not working (ref)														
Working	0.9**	[0.8, 1.0]	0.7**	[0.6, 0.9]	1.0	[0.8, 1.2]	1.0	[0.8, 1.1]	0.8*	[0.7, 1.0]	0.9	[0.7, 1.1]	0.8	[0.6, 1.0]
Ethnicity														
Hausa/Fulani (ref)														
Igbo	0.9	[0.7, 1.1]												
Yoruba	0.8**	[0.6, 0.9]												
Others	0.9	[0.8, 1.1]												
Getting medical health for self														
Getting permission to go														
Big problem (ref)														
Not a big problem	1.0	[0.9, 1.2]	1.1	[0.8, 1.5]	1.3	[0.8, 2.0]	0.8	[0.5, 1.4]	1.1	[0.8, 1.6]	0.9	[0.6, 1.1]	1.1	[0.8, 1.6]

Continued…

Table 5—*Continued*

	Nigeria		North Central		North East		North West		South East		South South		South West	
Variables	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI s**	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**	**Adjusted Hazard Ratios (aHR)**	**95% CI**
Getting money needed for treatment														
Big problem (ref)														
Not a big problem	1.0	[0.9, 1.1]	0.8*	[0.7, 1.0]	1.4**	[1.1, 1.7]	0.9	[0.7, 1.2]	1.0	[0.9, 1.1]	1.0	[0.8, 1.3]	0.9	[0.7, 1.1]
Distance to health facility														
Big problem (ref)														
Not a big problem	1.0	[0.9, 1.2]	1.0	[0.8, 1.2]	0.7**	[0.5, 0.9]	1.5	[1.0, 2.2]	0.9	[0.7, 1.1]	0.9	[0.7, 1.2]	1.2	[0.8, 1.7]
Not wanting to go alone														
Big problem (ref)														
Not a big problem	1.2*	[1.0, 1.3]	1.2	[0.9, 1.7]	1.5**	[1.1, 1.9]	0.7	[0.5, 1.1]	1.3	[0.9, 1.7]	1.5*	[1.0, 2.0]	1.0	[0.7, 1.4]

*** $p < .001$, ** $p < .01$, * $p < .05$

4 DISCUSSION

The objective of this study was to examine the reasons and determinants of contraceptive discontinuation across sub-national levels in Nigeria. Contraceptive discontinuation is a public health concern with important implications for unintended pregnancy, unwanted births, unsafe abortion, and maternal mortality in LMICs. This study addressed an important evidence gap by considering the large sub-national variations in contraceptive use and the paucity of sub-national evidence on contraceptive discontinuation across regions in Nigeria. Findings from the study have implications for designing effective context-specific programmatic interventions that address the problem of contraceptive discontinuation in different regions of Nigeria.

The results indicate that most discontinuation episodes occurred among users of injectable contraceptives, while the least number of episodes of discontinuation occurred among users of emergency contraception (see Table 1). Further analysis (see Table 3) shows that the reason for high episodes of discontinuing injectables is primarily fear of side effects, which agrees with findings of previous studies.[21,22] Our analyses indicate that most discontinuation episodes occurred because of the desire to become pregnant (see Tables 2 and 4). This suggests that fertility desire is high and remains the predominant reason for discontinuing contraceptive use among women in Nigeria. The implication is that a high fertility level persists in Nigeria, as research has shown that reduction in the high demand for children is a necessary precursor for fertility transition in high-fertility countries.[37–39]

Sub-national analysis indicates a disparity in contraceptive discontinuation rate across the six regions of Nigeria, which was highest in the North West and lowest in the South West (see Table 4). This result clearly demonstrates that contraceptive discontinuation partly accounts for the North West's lowest contraceptive prevalence among Nigeria's six regions.[40] Improving FP targets across regions will depend largely on contraceptive continuation among users.[17,18] It is therefore important to address the various reasons for the high rate of contraceptive discontinuation across different regions in Nigeria.

There are inconsistent findings on contraceptive discontinuation rates and reasons for contraceptive discontinuation by method type across the sub-national levels. In all six regions, the desire to become pregnant was the most important reason for contraceptive discontinuation by method type (see Table 4). This suggests that fertility desire is high across all regions of Nigeria. This may be associated with the high level of fertility across all regions with no region achieving the replacement fertility level of 2.1. This finding has important policy implications. With a high proportion of women discontinuing contraceptive use because of the desire to become pregnant across regions, achieving demographic transition and harnessing the demographic dividend (economic growth arising from favorable shift in population age structure) will remain a challenge in Nigeria unless appropriate interventions are implemented to address the high demand for children as advocated in earlier reports.[41,42] Reasons for discontinuing the male condom slightly differ across the regions—it was infrequent sex in North Central, the need for a more effective method in the North East, and the desire to become pregnant was the most commonly cited reason for discontinuing male condom in the other four regions (see Table 3). The majority of respondents discontinued using an implant in the North Central, North East, North West, and South West because of side effects, while this method was discontinued due to the desire to become pregnant in the South East and South South.

Results from our multivariable analysis indicate that the risks of discontinuing different types of contraceptives vary across the six regions (see Table 5). As at the national level, injectables had the highest risk of being discontinued in the North Central, North West, South East, and South West regions. Injectables had the highest discontinuation rate for all reasons when compared to the IUD (reference group). Thus, there is a need for appropriate interventions that target the reasons for discontinuing injectables, particularly since side effects were most commonly reported across all regions. As suggested by the ideation model, misconceptions and perceived risks (cognitive dimension) could explain a woman's intention to use or not use contraceptives.[31] Multivariable results also show some evidence of sub-national variations, with Yoruba women (who are predominantly residents in the south of Nigeria) having significantly lower hazard of contraceptive discontinuation compared to the Hausa and Fulani women who live primarily in the north.

The study shows that, with the exception of the South South Region, the risk of contraceptive discontinuation was significantly higher in all regions compared with the South West. This result supports our hypothesis by demonstrating the various reasons and risks of discontinuing contraceptives across different regions in Nigeria (see Tables 4 and 5). This is perhaps due to the unique features and nuances that characterize different regions of the country. Nigeria is culturally, socially, and economically diverse. The country is a multi-religious society with two predominant religions—Christianity and Islam—as well as a small proportion of adherents of indigenous religions. Thus, Nigeria's diversity, particularly in terms of cultural and religious beliefs, has a significant role in shaping reproductive behaviors and gender-related practices across different regions of the country.[43,44] Mobolaji et al. argued that Nigeria's six regions are characterized by an interplay of cultural and religious values, and as such, may be associated with the sociocultural framing of gender norms as well as reproductive choices and practices.[43] Thus, any FP program that is designed with a monolithic cultural lens in Nigeria is likely to fail, and there is the need for context-specific FP programs that consider Nigeria's diversity.

While interpreting the findings of this study, it is important to consider limitations. First, although the use of a nationally representative sample offers some strength, there are also some drawbacks. The sample constrains analysis to the available variables in the dataset, which limits deeper interrogation of cultural and religious values and practices that may influence contraceptive discontinuation. Second, the temporal sequence of events for some variables could pose some limitations. Third, we analyzed self-reported information that might include some social desirability bias. In addition, some regions had small samples, which were a limitation. Notwithstanding these limitations, the study addressed an important evidence gap that has critical policy implications for increasing contraceptive use across different regions in Nigeria.

5 CONCLUSION

The study identified a large disparity in contraceptive discontinuation rate across the six regions of Nigeria—which was highest in the North West and lowest in the South West region. Although pregnancy-related reasons are the most frequently cited reason for discontinuing contraceptive use among women, the other reasons for contraceptive discontinuation by method type, to a large extent, vary across regions in Nigeria. It is therefore important to address the various reasons for the high rate of contraceptive discontinuation across different regions. Our study suggests the need for context-specific family planning programming that considers the country's diversity and that can achieve a reduction in contraceptive discontinuation and increased contraceptive use, which can improve reproductive health outcomes throughout the different regions of Nigeria.

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