Kingdom of Cambodia

Contraceptive Discontinuation, Failure, and Switching in Cambodia

Further Analysis of the 2014 Cambodia Demographic and Health Survey

DHS Further Analysis Reports No. 105

Kingdom of Cambodia

Contraceptive Discontinuation, Failure, and Switching in Cambodia

Further Analysis of the 2014 Cambodia Demographic and Health Survey

DHS Further Analysis Reports No. 105

Wenjuan Wang
Rathavuth Hong

ICF
Rockville, Maryland, USA

2017

This report presents findings from a further analysis study undertaken as part of the follow-up to the 2014 Cambodia Demographic and Health Survey (CDHS). ICF provided technical assistance for the project. This report is a publication of the DHS program, which is designed to collect, analyze, and disseminate data on fertility, family planning, maternal and child health, nutrition, and HIV/AIDS. Funding was provided by the U.S. Agency for International Development (USAID) through the DHS Program (#AID-OAA-C-13-00095). The opinions expressed herein are those of the authors and do not necessarily reflect the views of USAID and other cooperating agencies.

The 2014 Cambodia Demographic and Health Survey (2014 CDHS) is part of The DHS Program, a worldwide project that assists countries in the collection of data to monitor and evaluate population, health, and nutrition programs. Funding was provided by the Royal Government of Cambodia (RGC), the United States Agency for International Development (USAID), the Australian Department of Foreign Affairs and Trade (Australia- DFAT), the United Nations Population Fund (UNFPA), the United Nations Children's Fund (UNICEF), the Japan International Cooperation Agency (JICA), the Korean International Cooperation Agency (KOICA), and the Health Sector Support Program—Second Phase (HSSP-2).

Additional information about the survey can be obtained from the National Institute of Statistics; 386 Monivong Boulevard, Sangkat Boeng Keng Kang 1, Chamkar Mon, Phnom Penh, Cambodia; Telephone: (855) 23-213650; E-mail: ssythan@hotmail.com; Internet: www.nis.gov.kh; and the Directorate General for Health, Ministry of Health, 80 Samdech Penn North Boulevard (289), Sangkat Boeungkak 2, Tuol Kork, Phnom Penh, Cambodia; Telephone: (855) 23-885970/23-884909; E-mail: webmaster@moh.gov.kh; Internet: www.moh.gov.kh. Additional information about The DHS Program can be obtained from ICF, 530 Gaither Road, Suite 500, Rockville, MD 20850 USA; Telephone: 301-572-0200, Fax: 301-572-0999, E-mail: info@DHSprogram.com, Internet: www.DHSprogram.com.

Suggested citation:

Wang, Wenjuan, and Rathavuth Hong. 2017. *Contraceptive Discontinuation, Failure, and Switching in Cambodia. Further Analysis of the 2014 Cambodia Demographic and Health Survey*. DHS Further Analysis Reports No. 105. Rockville, Maryland, USA: ICF.

CONTENTS

TABLES

FIGURES

ABSTRACT

Contraceptive prevalence, a measure that represents the proportion of women who currently use a contraceptive method, does not take into account the duration or interruption of use, or changes in method, which have an impact on the effectiveness of contraceptive use. Using data from the 2014 Cambodia Demographic and Health survey, this study estimated rates of contraceptive discontinuation, failure, and switching, including reasons for discontinuation, among married women age 15-49, and estimated the associations with selected socioeconomic and demographic characteristics.

The study found that one in every four women surveyed discontinued their contraceptive method during the first year of use. The two most commonly cited reasons for discontinuation were desire to become pregnant and health concerns with the method, while cost or access were rarely reported as reasons for discontinuation. Higher discontinuation rates were associated with lower parity, younger age, being in the poorest household quintile, and intention to space births. Method switching was uncommon. The highest switching rates were found for male condoms and injectables, and the lowest for implants. The overall 12-month contraceptive failure rate was 4%, but it was much higher among users of traditional methods such as rhythm (11%) and withdrawal (10%). Users of IUDs and implants had almost no risk of contraceptive failure.

INTRODUCTION

The contraceptive prevalence rate (CPR) has increased steadily over the past decades in Cambodia. According to the Cambodia Demographic and Health Surveys (CDHS), contraceptive use among married women increased from 24% in 2000 to 40% in 2005, 51% in 2010, and 56% in 2014. The total fertility rate (TFR)—roughly the number of children born per woman age 15-49—for the three years preceding the surveys fell from 3.8 in 2000 to 3.4 in 2005, 3.0 in 2010, and 2.7 in 2014 (National Institute of Statistics (NIS), Directorate General for Health (DGH), and ORC Macro 2001; National Institute of Public Health and Research (NIPH), National Institute of Statistics (NIS), and ORC Macro 2006; National Institute of Statistics (NIS), Directorate General for Health (DGH), and ICF International 2011; National Institute of Statistics (NIS), Directorate General for Health (DGH), and ICF International 2015). The CPR represents the proportion of married women (including women in union) who report that they or their spouse currently use a contraceptive method. This measure does not capture information on how long ago a woman started using her current method and how often she has stopped using or changed a method. Effective use of contraceptive methods to prevent unwanted pregnancies depends on continuous use (no disruption) and use of more effective (modern) methods rather than the less effective traditional methods. To further understand contraceptive use dynamics in Cambodia, this study analyzed data from the 2014 CDHS to estimate rates of contraceptive discontinuation, failure, and switching, including reasons for discontinuation, and to examine differences by selected socioeconomic and demographic characteristics of women and by method choice.

1. DATA AND METHODS

1.1 Data

This analysis used data from the 2014 Cambodia Demographic and Health Survey (CDHS). The survey used a two-stage stratified cluster sampling design to obtain representative estimates at the national level, for urban and rural areas, and for 19 subnational provinces or province groups. The survey interviewed a total of 15,825 households and 17,578 women age 15-49 (National Institute of Statistics/Cambodia, Directorate General for Health/Cambodia, and ICF International 2015). The analysis for this study focused on 11,898 currently married women.

1.2 Measures

The measure used for estimating contraceptive discontinuation, failure, and switching rates and the reasons for discontinuation is based on the reproductive-contraceptive calendar questions asked of women in the survey. The reproductive-contraceptive calendar is a month-by-month history of certain key reproductive events in the respondent's life for a period of 5-6 years preceding the date of interview. The calendar is "recent" in that it only includes events occurring in the year of the survey plus the five full calendar years preceding the current year. Previous studies have indicated that data on contraception histories and family planning use collected using calendar methods are equal or better in quality compared with those collected using standard questionnaire methods (Goldman, Moreno, and Westoff 1989; Callahan and Becker 2012).

Figures 1a and 1b show the calendar questions and form used in the 2014 CDHS. The DHS calendar form typically includes 72 boxes (each box representing one month of time) divided into six sections (each representing 12 months of time) in which to record information about the woman's experiences with childbearing and contraceptive use. The calendar is divided into two columns for different types of activities or events. The first column records the information on the woman's contraceptive use, births, pregnancies, and terminations (abortion, miscarriage, or still birth), and the second column collects reasons for discontinuation of contraceptive use. During the interview, interviewers recorded information about the woman's reproductive events and contraceptive use in each box (month) of Column 1 based on her responses. Reasons for discontinuation of contraceptive use were recorded in Column 2 in corresponding months of discontinuation of contraceptive use.

For each month in the calendar a single letter or digit code is used to record information concerning the events and activities. For example, for each birth that the respondent had in the period of the calendar, a letter B (Birth) is recorded in the month of birth. For each preceding month of pregnancy a letter P (Pregnancy) is recorded in the corresponding months in the calendar. If the respondent had a miscarriage, abortion, or still birth in the period covered by the calendar, a letter T (Termination) is recorded in the month the pregnancy ended, and a letter P (Pregnancy) is recorded for each preceding month of pregnancy. If the respondent used contraception in the intervening months between pregnancies, then each month of use of a contraceptive method is recorded using the code for that method (see codes for Column 1 in Figure 1). Column 2 recorded reasons for discontinuation of contraceptive use.

The calendar data are stored in the women file as string variables. Figure 2 provides an example of variable vcal_1 of five women. Codes in the variable read from right to left correspond to those in the

column that are read from bottom to top. A month or series of months that are filled with a code without interruption is called a segment or an event.

Figure 1a. Calendar questions

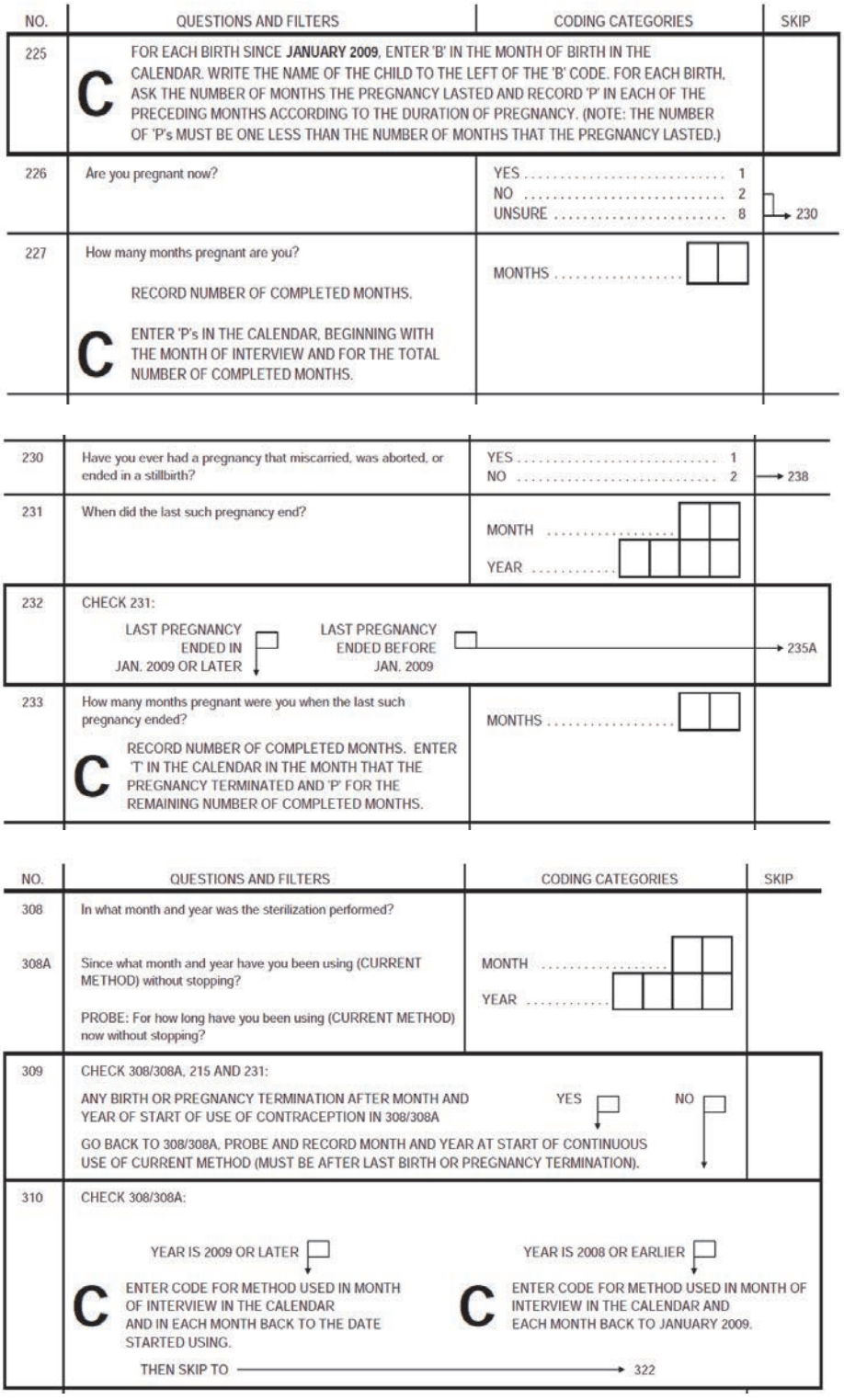


Figure 1b. Calendar form

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

INFORMATION TO BE CODED FOR EACH COLUMN

COLUMN 1: BIRTHS, PREGNANCIES, CONTRACEPTIVE USE**

- B BIRTHS
- P PREGNANCIES
- T TERMINATIONS

- 0 NO METHOD
- 1 FEMALE STERILIZATION
- 2 MALE STERILIZATION
- 3 IUD
- 4 INJECTABLES
- 5 IMPLANTS
- 6 PILL
- 7 MONTHLY PILL
- 8 CONDOM
- 9 FEMALE CONDOM
- D DIAPHRAGM
- J FOAM OR JELLY
- 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

				1	2	
	12	DEC	01			
	11	NOV	02			
	10	OCT	03			
	09	SEP	04			
2	08	AUG	05			2
0	07	JUL	06			0
1	06	JUN	07			1
4	05	MAY	08			4
*	04	APR	09			*
	03	MAR	10			
	02	FEB	11			
	01	JAN	12			
	12	DEC	13			
	11	NOV	14			
	10	OCT	15			
	09	SEP	16			
2	08	AUG	17			2
0	07	JUL	18			0
1	06	JUN	19			1
3	05	MAY	20			3
*	04	APR	21			*
	03	MAR	22			
	02	FEB	23			
	01	JAN	24			
	12	DEC	25			
	11	NOV	26			
	10	OCT	27			
	09	SEP	28			
2	08	AUG	29			2
0	07	JUL	30			0
1	06	JUN	31			1
2	05	MAY	32			2
*	04	APR	33			*
	03	MAR	34			
	02	FEB	35			
	01	JAN	36			
	12	DEC	37			
	11	NOV	38			
	10	OCT	39			
	09	SEP	40			
2	08	AUG	41			2
0	07	JUL	42			0
1	06	JUN	43			1
1	05	MAY	44			1
*	04	APR	45			*
	03	MAR	46			
	02	FEB	47			
	01	JAN	48			
	12	DEC	49			
	11	NOV	50			
	10	OCT	51			
	09	SEP	52			
2	08	AUG	53			2
0	07	JUL	54			0
1	06	JUN	55			1
0	05	MAY	56			0
*	04	APR	57			*
	03	MAR	58			
	02	FEB	59			
	01	JAN	60			
	12	DEC	61			
	11	NOV	62			
	10	OCT	63			
	09	SEP	64			
2	08	AUG	65			2
0	07	JUL	66			0
0	06	JUN	67			0
9	05	MAY	68			9
*	04	APR	69			*
	03	MAR	70			
	02	FEB	71			
	01	JAN	72			

Figure 2. Calendar data for five women in women's recode file

	caseid	vcal_1
1.	1 1 1	11100000BPPPPPPPP01111111111111111111111111111111111110TPP11111111
2.	1 2 2	0BPPPPPPPP0000TP00000001111111111111111111000000000000000000000000
3.	1 3 2	11111111111111111111111111111111111111111111111111111111111111111
4.	1 3 3	00000000000000000000000000000000000000000000000000000000000000000
5.	1 4 1	00000000000000000000000000000000000000000000000000000000000000000

For example, in Figure 2 the first woman (case id "1 1 1") had 10 reproductive and contraceptive events over the past five years. For the purpose of this study, the calendar variables were reshaped and converted to the event record. Figure 3 shows the event record of the same woman with case id "1 1 1"in Figure 2. The outcome variable of this study is a contraceptive event (duration in months). These event variables were used to calculate discontinuation of a contraceptive method—used a method then stopped or switched to a different method for any reason, or discontinued to become pregnant.

Figure 3. Decoded reproductive events (first woman shown in Figure 2)

	caseid	ev004	ev900	ev901	ev901a	ev902
1.	1 1 1	1	1309	1316	8	Pill
2.	1 1 1	2	1317	1318	2	Pregnancy
3.	1 1 1	3	1319	1319	1	Termination
4.	1 1 1	4	1320	1320	1	Not using
5.	1 1 1	5	1321	1357	37	Pill
6.	1 1 1	6	1358	1358	1	Not using
7.	1 1 1	7	1359	1366	8	Pregnancy
8.	1 1 1	8	1367	1367	1	Birth
9.	1 1 1	9	1368	1372	5	Not using
10.	1 1 1	10	1373	1375	3	Pill

The analysis unit of this study is the segment of contraceptive use, which refers to the continuous use of a contraceptive method. A woman could contribute multiple segments if she used multiple methods or zero segments if she did not use any method during the observation period. The five-year study period chosen for this study is 3-62 months before the interview month, which is commonly used in calculating contraceptive discontinuation and failure rates based on calendar data. Data within three months of the interview date were not used in order to avoid potential underestimation of the contraceptive failure rate because of unrecognition of a pregnancy in early pregnancy. Segments started before the calendar period were also excluded because information on the duration of use is not available. Segments that started within the observation period but ended outside the observation period were right-censored.

The analysis included a total of 7,745 segments from 5,811 women. Women who reported sterilization either for themselves or their spouts were excluded from the analysis. Table 1 shows the number of women who contributed various numbers of segments. The majority of women contributed one segment and about 20% contributed two, while a small proportion contributed three or more. Table 2 provides the distribution of the segments by type of method. As expected, the highest numbers of segments were for pills, injectables, and withdrawal, the three most commonly used contraceptive methods in Cambodia.

Table 1. Percent distribution of women by number of segments contributing to the analysis, Cambodia DHS 2014

Number of segments	Number of women	%
1	4,324	74.4
2	1,145	19.7
3	265	4.6
4+	78	1.3
Total number of women	**5,811**	**100.0**

Table 2. Percent distribution of segments analyzed, by contraceptive methods, Cambodia DHS 2014

Contraceptive method	Number of segments	%
Pill	2,468	31.9
IUD	554	7.2
Injections	1,527	19.7
Implants	285	3.7
Male condom	312	4.0
Rhythm	364	4.7
Withdrawal	2,161	27.9
Other*	73	0.9
Total number of segments	**7,745**	**100.0**

*Other includes female condom, diaphragm, LAM, and other methods

Differentials in contraceptive discontinuation and switching rates were analyzed by socio-demographic variables, including education (none, primary, secondary or more), wealth quintile (poorest, poorer, middle, richer, richest), place of residence (rural, urban), age (<25, 25-34, 35+), parity (0-1, 2-3, 4+), and contraceptive intention (limiting, spacing). While the last three variables were measured at the time of method discontinuation, others were collected at the time of interview and considered unchanged during the observation period.

1.3 Analysis

The life table approach was used to estimate the probability of discontinuation for the periods of 12 months and 24 months. A woman could discontinue a method for a variety of reasons. We used the multiple-decrement life table to determine the discontinuation rates for each method by reason, given the presence of other competing reasons. The analysis used the Stata command *stcompet* to estimate the cumulative incidence rates of discontinuation and confidence intervals in a multiple-risk setting, in this case the presence of multiple reasons for discontinuation. The overall discontinuation rates for each method were also estimated by summing up the rates for all the reasons, since the reasons are mutually exclusive.

Reasons for discontinuation were categorized into seven groups: 1) failure/become pregnant; 2) desire to become pregnant; 3) other fertility reasons, including infrequent sex or husband away, difficult to get pregnant or menopause, or marital dissolution; 4) health concerns with the method or side effects; 5) method related (inconvenience to use or wanted a more effective method); 6) cost of or access to the method; 7) other reasons, including husband's disapproval.

Contraceptive failure was one of the seven competing reasons in the calculation. A woman was considered to have contraceptive failure when she reported the reason for discontinuation was "became pregnant while using". Contraceptive failure rates were then calculated based on this response. The contraceptive failure rates calculated here are gross failure rates, which account for the confounding effects of discontinuation for reasons other than pregnancy (Farley 1983; Bongaarts and Potter 1983).

Contraceptive switching behavior was also examined. Women who reported use of a different method in the following month after discontinuation were considered to have a method switching event. The discontinuation rates and switching rates, for each method and all methods combined, were examined by women's background characteristics. All analyses accounted for the DHS sampling weights.

2. RESULTS

2.1 Contraceptive discontinuation by method and reason

Table 3 shows contraceptive prevalence among currently married women by method reported in the 2014 CDHS. More than half of women (56%) reported using a method to prevent pregnancy. The most commonly reported modern methods were pills, at 18% and injectables, at 9%, followed by IUDs, at 4%. The traditional method withdrawal was also commonly practiced, by 15% of currently married women.

Table 3. Contraceptive prevalence among married women, Cambodia DHS 2014

	%
Female Sterilization	3.0
Pill	17.7
IUD	4.4
Injectables	9.2
Implant	2.2
Male condom	2.1
Rhythm	3.0
Withdrawal	14.5
Other	0.3
Total	**56.4**

Table 4 shows contraceptive prevalence in 2014 by women's characteristics. Use of specific contraceptive methods differed by women's background characteristics. For example, use of pills and injectables was more common in rural areas, while use of male condoms and withdrawal was more common in urban areas.

Table 4. Percentage of married women who currently use contraceptive methods by selected background characteristics, Cambodia DHS 2014

Character-istics	Female Sterili-zation	Pill	IUD	Inject-able	Implant	Male condom	Rhythm	With-drawal	Other	Any method	Number of women
Contraceptive intention											
Spacing	1.7	16.0	3.5	8.2	2.2	2.1	2.6	13.6	0.3	**50.2**	7,316
Limiting	5.1	20.5	5.9	10.7	2.1	2.1	3.5	16.0	0.3	**66.2**	4,582
Parity											
0-1	0.4	13.4	2.9	7.0	1.8	1.4	1.8	10.5	0.1	**39.3**	3,760
2-3	3.1	21.9	5.6	10.6	2.7	2.7	3.7	17.3	0.4	**68.0**	5,527
4+	6.6	15.2	4.2	9.3	1.6	1.8	3.2	14.3	0.4	**56.6**	2,611
Age group											
<25	0.1	14.6	3.6	9.7	2.4	1.1	1.0	11.5	0.1	**44.1**	2,283
25-34	2.0	22.2	5.4	10.4	2.8	2.9	2.9	16.3	0.2	**65.1**	4,874
35+	5.6	14.6	3.9	7.6	1.4	1.7	3.9	14.1	0.4	**53.2**	4,741
Education											
No education	4.2	18.2	2.7	12.2	1.4	1.2	1.1	10.9	0.3	**52.2**	1,774
Primary	2.9	18.6	4.5	9.6	2.2	1.7	2.0	14.7	0.3	**56.5**	6,399
Secondary	2.8	16.0	5.1	6.9	2.5	3.2	5.6	15.8	0.2	**58.1**	3,726
Wealth quintile											
Lowest	2.0	19.0	3.9	12.0	1.8	0.7	1.1	12.0	0.3	**52.8**	2,294
Second	2.6	20.3	4.4	11.5	1.6	1.8	1.4	11.6	0.2	**55.4**	2,404
Middle	3.2	18.7	3.2	9.3	2.3	1.5	2.0	13.2	0.3	**53.7**	2,365
Fourth	3.2	18.4	4.5	8.6	2.7	1.6	3.0	15.5	0.4	**57.9**	2,393
Highest	4.2	12.5	6.2	4.5	2.4	4.8	7.3	19.9	0.3	**62.1**	2,443
Residence											
Urban	3.7	13.7	5.1	2.9	2.3	5.1	7.0	19.9	0.2	**59.9**	1,818
Rural	2.9	18.5	4.3	10.3	2.1	1.6	2.2	13.5	0.3	**55.7**	10,080
Total	3.0	17.7	4.4	9.2	2.2	2.1	3.0	14.5	0.3	**56.4**	11,898

Note: Contraceptive intention: If a woman's actual number of children was more than or equal to her ideal number of children, the segment was classified as use for limiting births, otherwise for spacing.

Figure 4 shows the 12-month discontinuation rates by method, for any reason. Overall, about one in every four women discontinued their method during the first year of use. The highest discontinuation rate was observed among users of male condoms, among whom more than one-third (35%) discontinued the method within the first year. Among other modern methods, discontinuation rates were 32% for injectables and 26% for pills. Users of traditional methods, including rhythm and withdrawal, had discontinuation rates of 27% and 23%, respectively.

Figure 4. 12-month discontinuation rates by method, Cambodia DHS 2014

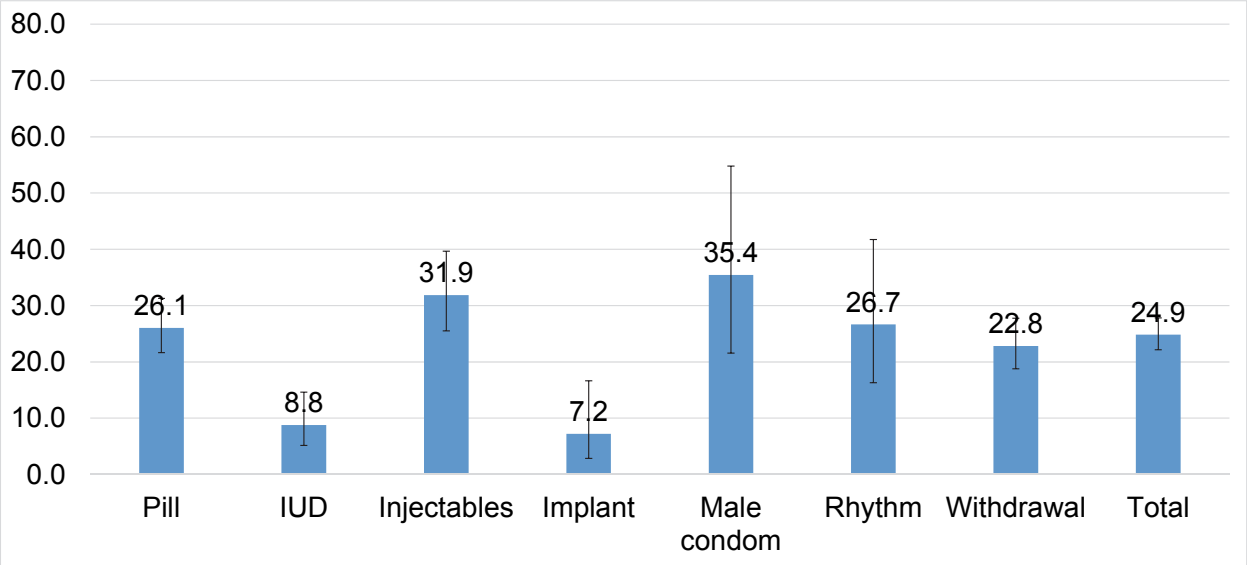


Table 5 presents 12-month discontinuation rates and the 95% confidence intervals for each method, by reason for discontinuation. Overall among users of modern methods, the two most commonly cited reasons for discontinuation were to become pregnant and health concerns. For example, 15% of women who used injectables stopped using the method within 12 months because of side effects or health concerns. Wanting to become pregnant was a reason cited for discontinuation by 8% of pill users, 7% of injectable users, and 11% of male-condom users. Method-related reasons, including inconvenience to use, were also often cited, especially among users of pills (5%) and male condoms (9%). Cost or access was rarely reported as a reason for discontinuation for any of the methods.

Table 5 indicates that the overall contraceptive failure rate was low (4%). As expected, the highest failure rates were among users of traditional methods, rhythm (11%) and withdrawal (10%). In contrast, users of long-acting reversible methods such as IUDs and implants had almost no risk of contraceptive failure.

Table 5. 12-month discontinuation rates and 95% confidence intervals by reason for discontinuation, Cambodia DHS 2014

	Pill			IUD			Injectables			Implant			Male condom			Rhythm			Withdrawal			Any method		
	Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI	
Reason		Low	High		Low	High		Low	High		Low	High		Low	High		Low	High		Low	High		Low	High
Failure	1.5	1.0	2.1	0.0	-	-	1.4	0.8	2.1	0.0	-	-	3.2	1.5	5.9	10.6	7.5	14.3	10.2	8.9	11.6	4.3	3.8	4.8
Desires pregnancy	8.1	6.9	9.3	0.4	0.1	1.4	6.8	5.5	8.3	1.0	0.2	3.3	11.0	7.5	15.1	5.3	3.2	8.2	6.6	5.5	7.8	6.5	6.0	7.2
Other fertility reason	0.4	0.2	0.8	0.0	-	-	1.4	0.9	2.2	0.0	-	-	4.1	2.2	7.1	1.4	0.5	3.1	0.3	0.1	0.6	0.8	0.6	1.0
Health/side effects	9.3	8.2	10.6	5.5	3.7	7.8	14.9	13.0	16.9	4.2	2.2	7.3	5.6	3.2	8.8	0.7	0.2	2.2	0.4	0.2	0.8	6.9	6.3	7.5
Method related	4.8	3.9	5.7	2.2	1.2	3.8	4.4	3.4	5.6	1.3	0.3	3.7	9.3	6.2	13.1	3.4	1.8	5.8	4.1	3.3	5.1	4.3	3.9	4.8
Cost/access	0.2	0.1	0.4	0.0	-	-	0.8	0.4	1.5	0.0	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.2	0.1	0.4
Other reason/DK	1.8	1.3	2.5	0.6	0.2	1.7	2.1	1.4	3.0	0.6	0.1	2.2	2.3	0.9	4.8	5.3	3.2	8.2	1.3	0.9	1.9	1.8	1.5	2.1
Any reason	26.1	21.7	31.3	8.8	5.2	14.6	31.9	25.5	39.7	7.2	2.9	16.6	35.4	21.6	54.8	26.7	16.3	41.8	22.8	18.8	27.8	24.9	22.2	27.8

Figure 5 presents overall 24-month discontinuation rates by method, for any reason. The 24-month discontinuation rate indicates the percentage of users who discontinued their method within 24 months of use. Since the discontinuation rate is cumulative, the 24-month rates are expected to be higher than the 12-month rates for all the methods and reasons. For example, discontinuation rates among users of implants and male condoms at the end of the second year of use were more than double the rate at the end of the first year. Overall, 42% of women discontinued their method by the end of the second year of use. Half of women who used injectables or male condoms stopped using them within two years of use.

Figure 5. 24-month discontinuation rates by method, Cambodia DHS 2014

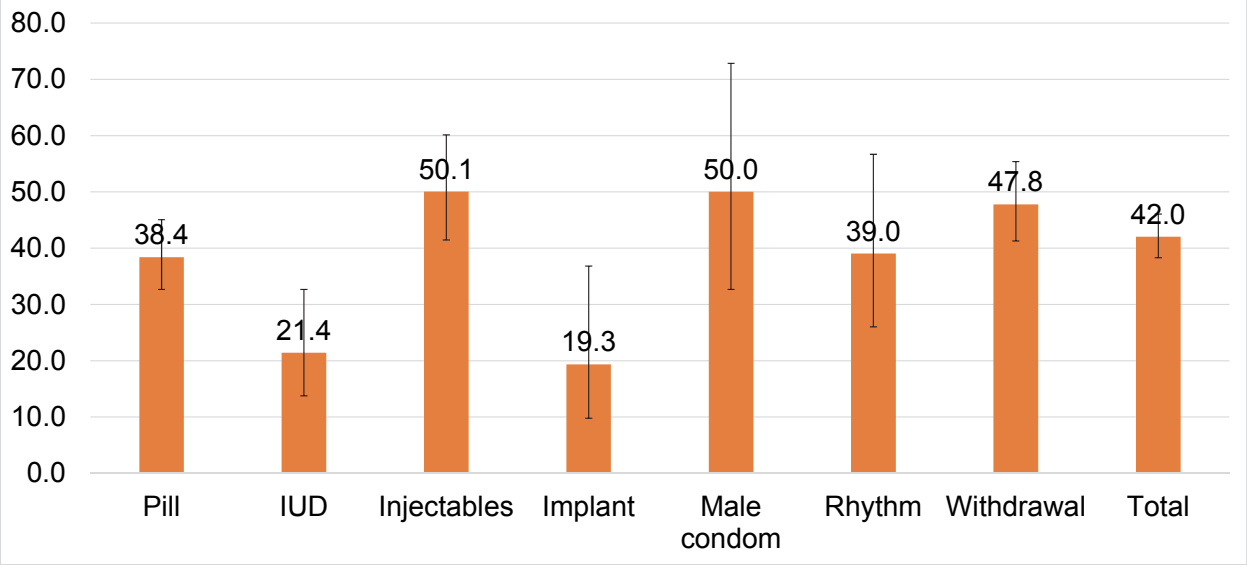


Table 6 presents 24-month discontinuation rates and the confidence intervals. The patterns by reason for specific methods were similar to the 12-month patterns. Compared with the first year of use, contraceptive failure rates almost doubled by the end of the second year, at 8%. Failure rates were highest for withdrawal, at 20% after 24 months, twice the level at 12 months of use. The contraceptive failure rate remained low among users of modern methods, however, especially long-acting reversible methods.

Table 6. 24-month discontinuation rates and 95% confidence intervals by reason for discontinuation, Cambodia DHS 2014

	Pill			IUD			Injectables			Implant			Male condoms			Rhythm			Withdrawal			Any method		
	Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI		Rate	95% CI	
Reason		Low	High		Low	High		Low	High		Low	High		Low	High		Low	High		Low	High		Low	High
Failure	2.7	2.0	3.5	0.3	0.0	1.5	1.8	1.1	2.6	0.0	-	-	4.3	2.2	7.6	14.8	11.0	19.2	20.1	18.1	22.1	7.8	7.2	8.6
Desires pregnancy	13.7	12.2	15.4	6.0	3.8	9.0	13.3	0.2	15.4	3.0	1.1	6.7	19.8	14.8	25.3	12.5	8.8	16.9	14.9	13.2	16.8	13.3	12.4	14.2
Other fertility reason	0.9	0.6	1.5	0.0	-	-	2.2	7.8	3.2	1.0	0.2	3.8	4.8	2.6	8.1	1.4	0.5	3.1	0.7	0.4	1.2	1.3	1.0	1.6
Health/side effects	12.3	10.9	13.8	8.1	5.8	10.9	21.2	0.4	23.6	12.5	7.8	18.2	5.6	3.2	8.8	0.7	0.2	2.2	0.6	0.3	1.1	9.6	8.8	10.3
Method related	5.8	4.8	6.9	5.8	3.7	8.5	6.3	5.0	7.8	1.5	0.4	4.2	11.9	8.2	16.4	4.3	2.4	7.1	8.7	7.3	10.1	6.8	6.1	7.4
Cost/access	0.4	0.2	0.7	0.0	-	-	1.6	0.3	2.4	0.0	-	-	0.0	-	-	0.0	-	-	0.2	0.1	0.7	0.5	0.3	0.7
Other reason/DK	2.6	1.9	3.3	1.2	0.4	2.8	3.8	9.8	5.1	1.3	0.3	3.8	3.6	1.7	6.7	5.3	3.2	8.2	2.6	1.9	3.4	2.9	2.5	3.3
Any reason	38.4	32.7	45.0	21.4	13.7	32.7	50.1	1.1	60.1	19.3	9.8	36.8	50.0	32.7	72.8	39.0	26.0	56.7	47.8	41.3	55.4	42.0	38.3	46.1

2.2 Differentials in contraceptive discontinuation rates by background characteristics of users.

Table 7 shows the 12-month discontinuation rates for each specific method and for all methods combined by women's socio-demographic characteristics and contraceptive intention. The overall discontinuation rate was associated with lower parity, younger age, being in the poorest household, and intention to space births. The same pattern was also observed for users of each method.

The differentials in discontinuation rates by woman's education were notable. Overall, women with secondary or higher education had the highest discontinuation rates. This may be because a larger proportion of women with secondary or higher education reported using traditional methods such as rhythm and withdrawal compared with women with no education (see Table 4). When looking at method-specific associations, higher discontinuation rates were observed among users of male condoms, abstinence, and withdrawal with secondary or higher education compared with other education groups. Comparing urban versus rural residence, in urban areas women using pills, IUDs, implants, male condoms, and abstinence had higher discontinuation rates than rural women using these methods.

Table 7. 12-month discontinuation rates by women's background characteristics, Cambodia DHS 2014

Characteristics	Pill	IUD	Inject-ables	Implant	Male condom	Rhythm	With-drawal	Other	Any method
Contraceptive intention									
Spacing	29.7	10.7	37.3	7.5	39.4	32.4	26.2	38.5	28.9
Limiting	17.8	6.4	21.2	6.7	24.2	16.0	14.7	18.9	16.3
Parity									
0-1	36.7	14.9	48.5	10.4	52.8	41.2	31.3	35.3	36.3
2-3	18.7	6.9	22.7	7.1	22.6	24.4	19.9	35.1	18.9
4+	21.3	4.8	25.3	0.0	28.2	8.1	10.7	25.1	17.0
Age group									
<25	44.0	17.7	49.4	15.7	73.1	42.4	35.5	71.8	42.1
25-34	20.3	8.9	27.0	6.7	26.5	33.1	24.4	35.0	22.3
35+	15.3	4.0	21.3	1.4	16.1	13.2	8.1	9.0	12.8
Education									
No education	22.0	9.8	23.1	3.8	26.9	0.0	16.4	27.1	19.8
Primary	25.3	8.2	33.0	8.5	30.3	22.5	22.1	37.2	24.4
Secondary or higher	29.2	9.3	34.8	6.2	39.6	30.5	25.4	25.7	27.2
Wealth quintile									
Lowest	24.9	28.6	4.8	30.2	4.4	36.8	16.5	19.4	48.0
Second	21.6	19.5	7.7	30.5	4.5	28.7	12.3	22.9	27.7
Middle	23.8	27.5	15.2	29.2	10.7	28.3	24.2	17.1	30.9
Fourth	21.9	19.7	7.5	36.3	6.0	42.6	26.7	18.5	15.9
Highest	30.1	36.3	9.3	36.4	9.1	36.5	31.4	29.5	35.1
Residence									
Urban	33.2	13.8	46.5	7.6	35.6	30.7	33.1	32.9	32.1
Rural	25.0	7.7	30.6	7.2	35.3	24.3	19.0	33.3	23.2
Total	26.1	8.8	31.9	7.2	35.4	26.7	22.8	33.1	24.9

Table 8 shows the 24-month discontinuation rates by women's characteristics and their contraceptive intention. The patterns are similar to the 12-month discontinuation rates shown above.

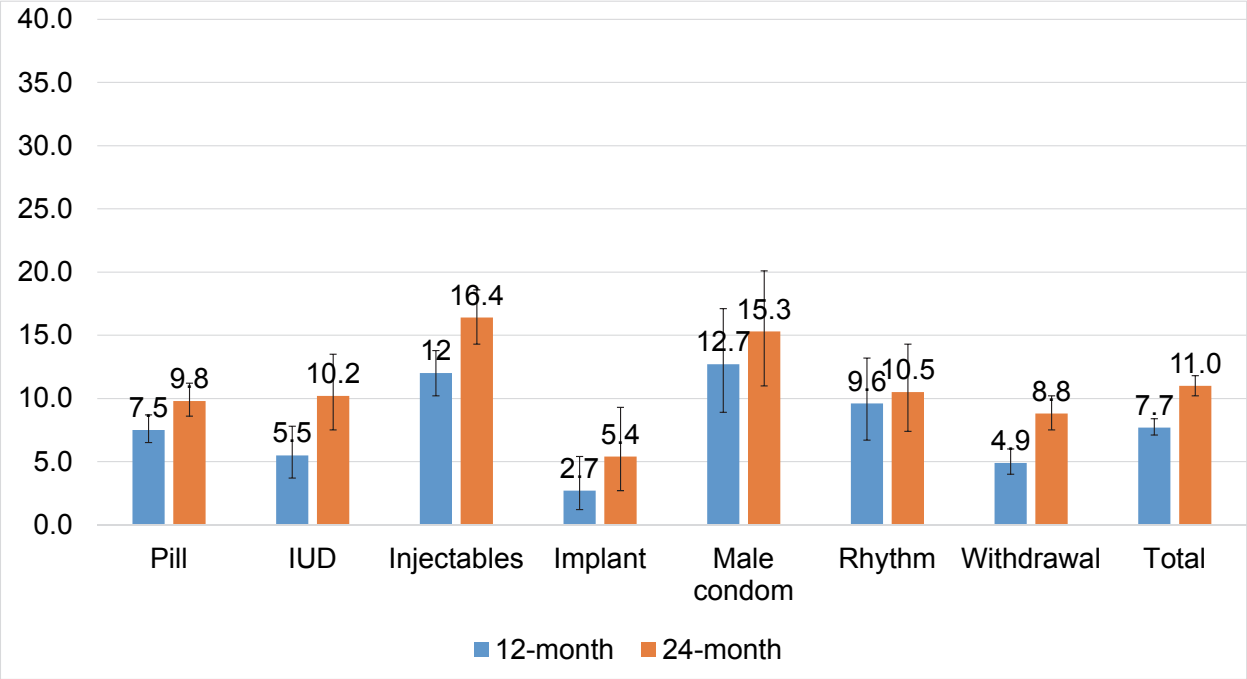
Table 8. 24-month discontinuation rates by background characteristics, Cambodia DHS 2014

Characteristics	Pill	IUD	Inject-ables	Implant	Male condom	Rhythm	With-drawal	Other	Any method
Contraceptive intention									
Spacing	45.1	28.2	57.1	20.9	54.1	47.7	54.1	53.9	48.9
Limiting	23.4	13.4	35.9	16.5	37.8	24.2	32.2	24.3	27.4
Parity									
0-1	54.4	38.9	68.1	37.1	72.1	57.3	65.2	66.0	59.9
2-3	28.7	16.6	40.3	14.2	32.9	38.1	40.4	36.6	33.3
4+	27.1	10.4	43.0	6.5	28.2	13.2	26.7	31.9	28.3
Age group									
<25	64.5	39.8	71.7	33.5	86.2	58.3	70.8	87.0	66.8
25-34	31.5	26.8	45.7	20.4	45.4	47.0	51.4	54.8	40.6
35+	21.5	6.4	35.9	7.7	16.1	22.7	21.1	12.4	22.3
Education									
No education	34.7	29.8	37.6	3.8	49.0	22.4	37.2	27.1	34.8
Primary	36.5	16.5	51.8	24.3	43.5	35.5	46.5	57.3	41.0
Secondary	43.9	26.9	53.7	17.1	54.6	42.0	52.0	33.4	46.1
Wealth									
Lowest	42.4	42.3	13.4	46.6	30.3	76.1	44.8	44.3	54.5
Second	38.0	31.5	22.9	48.5	17.7	44.2	24.0	48.1	27.7
Middle	39.9	35.3	31.9	53.3	32.2	38.9	44.4	35.3	76.3
Fourth	39.5	36.4	20.0	49.6	15.2	54.0	39.2	44.6	32.1
Highest	48.0	48.1	21.0	55.7	14.9	50.3	39.7	56.5	37.0
Residence									
Urban	48.1	23.2	64.8	17.4	45.6	39.2	61.1	35.4	51.3
Rural	36.9	21.2	48.6	20.1	52.7	38.5	42.6	50.9	39.8
Total	38.4	21.4	50.1	19.3	50.0	39.0	47.8	46.4	42.0

2.3 Contraceptive switching rates

Figure 6 shows the 12-month and 24-month switching rates with 95% confidence intervals (overall and by specific methods). For all methods combined, 8% of users switched their method within 12 months of use. The highest switching rates were found among users of male condoms and injectables, whereas the lowest rates were for implants. The results on implants should be interpreted with caution, given the small number of implant users. As would be expected, the 24-month switching rates were higher, at 11% for all methods together compared with the 12-month rates.

Figure 6. 12-month and 24-month switching rates by method, Cambodia DHS 2014



2.4 Differentials in contraceptive switching

Table 9 shows the 12-month contraceptive switching rates by women's background characteristics and their contraceptive intention. For most of the characteristics the differences in switching rates for all methods combined were small. Significantly higher switching rates were observed among users with no education compared with those with some education whether primary or secondary. The switching rate was also highest in the wealthiest quintile.

The method-specific switching patterns varied by women's background characteristics. Among users of pills and injectables, higher switching rates were found among women age 35 or older, women with no education, women in the wealthiest quintile, and women in urban areas.

Table 9. 12-month method switching rates by background characteristics, Cambodia DHS 2014

Characteristics	Pill	IUD	Inject-ables	Implant	Male condom	Rhythm	With-drawal	Other	Any method
Contraceptive intention									
Spacing	7.1	5.0	14.8	2.9	10.5	10.3	4.5	23.3	8.0
Limiting	8.6	6.1	6.3	2.4	18.8	8.4	5.9	0.0	7.2
Parity									
0-1	8.1	7.1	17.3	4.0	11.2	7.2	4.9	16.8	8.9
2-3	6.7	5.1	10.2	2.6	14.3	13.3	5.5	22.6	7.5
4+	9.1	4.2	6.8	0.0	11.5	1.6	2.9	3.8	5.8
Age group									
<25	4.8	6.3	6.2	0.0	4.1	0.0	2.8	0.0	4.5
25-34	6.5	5.7	12.6	2.7	9.5	7.3	5.0	19.6	7.4
35+	10.6	5.1	14.0	3.5	15.8	11.5	5.3	20.0	9.3
Education									
No education	10.8	10.7	19.6	9.6	17.5	10.7	8.8	26.9	12.6
Primary	6.5	5.1	10.1	1.3	11.4	12.8	5.1	23.2	7.1
Secondary	5.4	3.7	7.0	0.0	10.0	4.7	1.0	2.5	4.2
Wealth quintile									
Lowest	6.7	3.0	7.0	4.4	5.8	3.8	4.3	24.9	6.1
Second	4.9	7.2	13.4	1.0	1.3	0.0	3.7	6.1	6.4
Middle	4.7	9.3	9.3	0.0	16.6	18.7	2.3	14.0	6.1
Fourth	7.2	2.5	17.5	2.6	15.5	15.0	5.7	7.3	8.8
Highest	15.2	5.6	17.0	4.6	14.6	8.3	6.6	22.6	10.3
Residence									
Urban	12.7	10.9	24.3	0.7	12.8	10.1	5.6	16.5	10.1
Rural	6.7	4.4	10.9	3.2	12.7	9.3	4.6	17.0	7.2
Total	7.5	5.5	12.0	2.7	12.7	9.6	4.9	16.9	7.7

Table 10 presents the 24-month contraceptive switching rates by women's background characteristics and contraceptive intention. The patterns are similar to the 12-month switching rates.

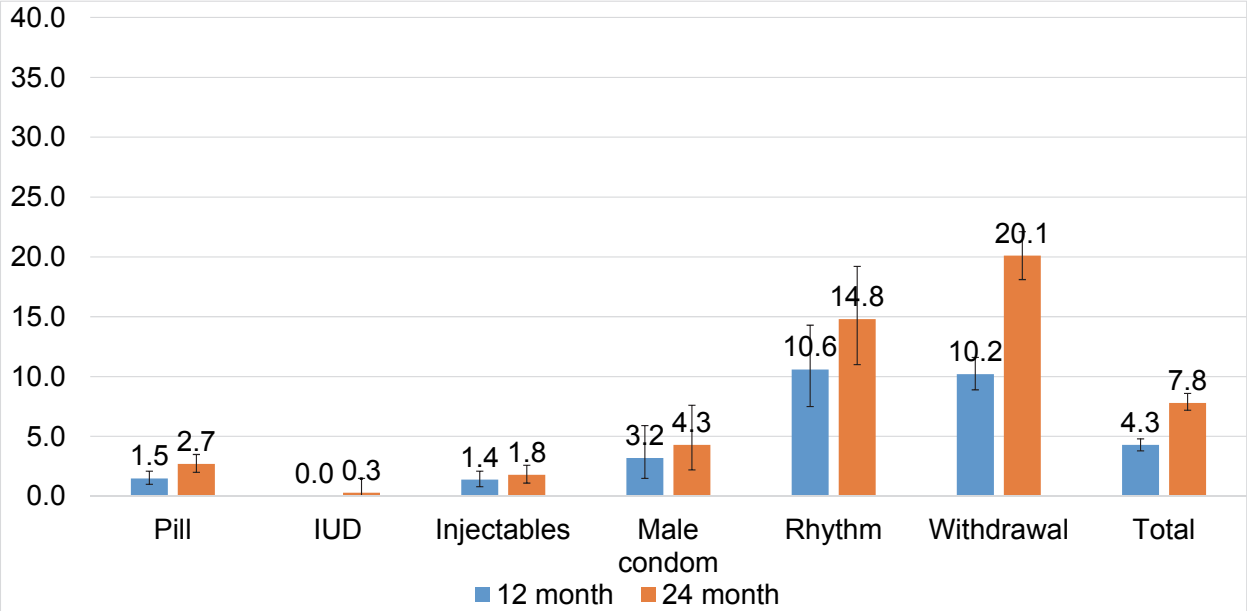
Table 10. 24-month method switching rates by background characteristics, Cambodia DHS 2014

Characteristics	Pill	IUD	Inject-able	Implant	Male condom	Rhythm	With-drawal	Other	Any method
Contraceptive intention									
Spacing	10.0	8.5	18.6	6.1	11.8	11.5	7.9	25.0	11.1
Limiting	9.4	12.3	12.0	4.1	25.9	8.9	10.8	0.0	10.8
Parity									
0-1	10.1	14.4	20.8	9.5	12.4	7.2	7.8	18.4	11.6
2-3	9.7	9.4	14.7	4.2	18.6	15.0	10.4	24.2	11.4
4+	9.6	6.1	12.8	2.9	11.5	1.6	5.7	3.8	8.3
Age group									
<25	6.6	18.0	9.3	0.0	19.8	22.4	5.0	0.0	7.8
25-34	8.4	8.1	17.3	7.1	10.9	7.3	8.3	21.9	10.4
35+	13.8	11.9	18.9	4.0	18.1	11.8	10.3	20.0	13.1
Education									
No education	14.6	18.2	23.4	9.6	17.5	10.7	13.4	30.4	16.4
Primary	8.6	12.7	15.1	5.5	15.9	14.8	9.5	24.7	10.9
Secondary	6.6	3.7	11.3	1.5	10.0	4.7	3.2	2.5	6.1
Wealth quintile									
Lowest	8.5	8.5	9.7	4.4	5.8	3.8	7.2	24.9	8.5
Second	8.0	8.8	18.5	2.1	7.9	5.8	7.8	6.1	10.2
Middle	5.6	18.8	14.5	2.2	20.5	18.7	3.9	14.0	8.8
Fourth	9.0	12.2	23.4	9.3	15.5	15.0	11.9	11.8	13.3
Highest	19.0	5.6	21.3	5.3	17.3	8.7	10.4	24.5	13.4
Residence									
Urban	17.6	11.4	27.7	3.7	15.1	10.1	9.9	19.0	13.6
Rural	8.6	10.2	15.4	5.8	15.5	10.6	8.3	17.9	10.4
Total	9.8	10.2	16.4	5.4	15.3	10.5	8.8	18.2	11.0

2.5 Contraceptive failure

Contraceptive failure, as defined above, is a special form of discontinuation: becoming pregnant unintentionally while using a method to prevent pregnancy. Figure 7 presents 12-month and 24-month overall and method-specific contraceptive failure rates. Overall in 2014, 12-month and 24-month contraceptive failure rates were 4% and 8%, respectively. As would be expected, method-specific contraceptive failure rates were much higher among traditional methods such as rhythm and withdrawal. Among the more effective and long-lasting methods, IUDs and implants carried virtually no risk of failure, while failure rates for pills and injectables were minimal, as Figure 7 shows.

Figure 7. 12-month and 24-month failure rates by methods, Cambodia DHS 2014



*The estimated failure rate was zero for both periods.

3. DISCUSSION

The availability of data from the reproductive calendar in the 2014 CDHS provides an opportunity to study the dynamics of contraceptive use in Cambodia—the length of time women use specific methods, how often they stop using their method or change to a different one, and their reasons for doing so. During the five years before the survey, one-fourth of all contraceptive users (25%) discontinued their method within the first 12 months, while 42% discontinued within the first 24 months. The rates are comparable to those in some other recently surveyed countries in the region—Indonesia (27%) and Afghanistan (26%)—but lower than Bangladesh (30%), Pakistan (37%), and Nepal (51%), for 12-month discontinuation rates.

The main reasons for discontinuation in Cambodia are health concerns/side effects (12%), method-related problems (8%), and fertility-related reasons other wanting to become pregnant (7%). It would be interesting to know whether, when women discontinue using a method because of health concerns, side effects, or method-related problems, they do so on their own or on the advice of a healthcare provider. It is worth noting that the discontinuation rates for the long-acting reversible methods IUD and implant are among the lowest of any method. This may indicate that women are well informed about these methods before adopting them and thus have confidence in their suitability.

As would be expected, discontinuation rates are much higher among women using contraception for spacing than for limiting births, and are higher among women with 0-1 children than with two or more, reflecting family planning for short-term use. Younger contraceptive users (under age 25) are much more likely than women age 25 and older to discontinue use. Young women may experiment with several different methods but may not have decided to adopt any specific method. In contrast, older women may already have experience with some methods and be more aware of what suits them best. Surprisingly, discontinuation rates are positively associated with increasing level of education. One might expect that more education would be associated with lower discontinuation rates, reflecting better understanding of methods and adoption of suitable methods. The fact that users with more education reported higher discontinuation rates could be due to higher prevalence of traditional method use among this group.

For method switching, the analysis found that the associations of method switching with age and education are in the opposite direction than for method discontinuation. Younger users have a higher discontinuation rate but a lower switching rate, while older users have a lower discontinuation rate but higher switching rate. The 12-month contraceptive switching rate in Cambodia, at 8%, is about the same as in Pakistan and Nepal (7%), but lower than in Bangladesh (12%) and Indonesia (13%).

The overall contraceptive failure rate is low in Cambodia, at 4%, which is similar to the rates in other countries in the region (from 2% in Afghanistan and Indonesia to 5% in Nepal). While the failure rate is low, it is concentrated among the users of less effective methods, with 12-month failure rates of 11% for rhythm and 10% for withdrawal. This finding suggests that family planning programs need to reach out to users of traditional methods and encourage them to switch to more effective methods.

REFERENCES

Bongaarts, J., and R. G. Potter. 1983. *Fertility, Biology and Behavior: An Analysis of the Proximate Determinants*. New York: Academic Press.

Bradley, Sarah E. K., Trevor N. Croft, and Shea O. Rutstein. 2011. *The Impact of Contraceptive Failure on Unintended Births and Induced Abortions: Estimates and Strategies for Reduction*. DHS Analytical Studies No. 22. Calverton, Maryland, USA: ICF Macro.

Bradley, Sarah E.K., Hilary M. Schwandt, and Shane Khan. 2009. *Levels, Trends, and Reasons for Contraceptive Discontinuation.* DHS Analytical Studies No. 20. Calverton, Maryland, USA: ICF Macro.

Callahan, R. L., and S. Becker. 2012. "The Reliability of Calendar Data for Reporting Contraceptive Use: Evidence from Rural Bangladesh." *Studies in Family Planning* 43(3):213-222.

Central Statistics Organization (CSO), Ministry of Public Health (MoPH), and ICF. 2017. *Afghanistan Demographic and Health Survey 2015.* Kabul, Afghanistan: Central Statistics Organization.

Farley, T. M. M. 1986. Life-Table Methods for Contraceptive Research. *Statistics in Medicine* 5:475–489.

Goldman N., L. Moreno, and C. F. Westoff. 1989. "Collection of Survey Data on Contraception: An Evaluation of an Experiment in Peru." *Studies in Family Planning* May-June 20(3):147-57.

Ministry of Health and Family (MOHF) [Maldives] and ICF Macro. 2010. *Maldives Demographic and Health Survey 2009.* Calverton, Maryland: MOHF and ICF Macro.

Ministry of Health and Population (MOHP) [Nepal], New ERA [Nepal], and ICF International. 2012. *Nepal Demographic and Health Survey 2011.* Kathmandu, Nepal: MOPH, New ERA, and ICF International.

National Institute of Population Research and Training (NIPORT) [Bangladesh], Mitra and Associates, and ICF International. 2016. *Bangladesh Demographic and Health Survey 2014*. Dhaka, Bangladesh: NIPORT, Mitra and Associates, and ICF International.

National Institute of Population Studies (NIPS) [Pakistan] and ICF International. 2013. *Pakistan Demographic and Health Survey 2012-13*. Islamabad, Pakistan: NIPS and ICF International.

National Institute of Public Health [Cambodia], National Institute of Statistics [Cambodia], and ORC Macro. 2006. *Cambodia Demographic and Health Survey 2005*. Phnom Penh, Cambodia, and Calverton, Maryland, USA: National Institute of Public Health, National Institute of Statistics, and ORC Macro.

National Institute of Statistics [Cambodia], Directorate General for Health [Cambodia], and ICF Macro. 2011. *Cambodia Demographic and Health Survey 2010.* Phnom Penh, Cambodia, and Calverton, Maryland, USA: National Institute of Statistics, Directorate General for Health, and ICF Macro.

National Institute of Statistics [Cambodia], Directorate General for Health [Cambodia], and ICF International, 2015. *Cambodia Demographic and Health Survey 2014*. Phnom Penh, Cambodia, and Rockville, Maryland, USA: National Institute of Statistics, Directorate General for Health, and ICF International.

Statistics Indonesia (Badan Pusat Statistik—BPS), National Population and Family Planning Board (BKKBN), and Kementerian Kesehatan (Kemenkes—MOH), and ICF International. 2013. *Indonesia Demographic and Health Survey 2012*. Jakarta, Indonesia: BPS, BKKBN, Kemenkes, and ICF International

Staveteig, Sarah, Lindsay Mallick, and Rebecca Winter. 2015. *Uptake and Discontinuation of Long-Acting Reversible Contraceptives (LARCs) in Low-Income Countries.* DHS Analytical Studies No. 54. Rockville, Maryland, USA: ICF International.