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Abstract

This study aims to provide an in-depth assessment of changes in contraceptive dynamics among ever-married Egyptian women based on calendar data from the 2008 and 2014 EDHS surveys. The sample from EDHS 2008 included 10,704 use segments and in EDHS 2014 it included 15,236. Single/multiple decrement life tables were built to examine net rates of discontinuation by reasons, and women's status after discontinuation (no longer in need; method failure; switched to another method; abandoned use while in need).

The 12 months discontinuation rate in the 2014 survey is 30%. The magnitude of the current increase is about 4.3 percentage points (2.3, 1.8, and 0.7 percentage points for the IUD, pill, and injectable segments). The increase occurred among all background groups, with only two exceptions: it dropped in urban Upper Egypt and among women in the highest wealth index quintile.

Five main reasons for discontinuation are considered: contraceptive failure, side effects/health concerns, other method/service-related reasons, desire to get pregnant, and not exposed to pregnancy. While the highest reason-specific discontinuation rate remains "side effects/health concerns," the second highest in EDHS 2008, "other method/service-related reasons," has dropped significantly, and "desire to become pregnant" has emerged in EDHS 2014 as the new second highest reason-specific discontinuation rate. Discontinuation-specific rates due to method failure have significantly increased.

The reasons were aggregated to reflect two main groups of factors: "method/service-related" and "reduced need." The discontinuation rate for the former has remained almost unchanged at about 18%, while the latter has significantly increased from 8% to 12% indicating a meaningful shift in the reasons for discontinuation away from method/service-related reasons and toward need-based reasons for all three methods. This trend is clear and significant across all background categories. The "method/service related" reasons rate decreased in Upper Egypt and especially in urban Upper Egypt.

While reducing fertility is an essential component of Egypt's development, the rise in the ideal family size and the discontinuation driven by the "desire to become pregnant" is a strong indicator that the strategic target of "avoiding unwanted births" may become a low priority consideration on the agenda. The main program related reasons for discontinuation suggest that better counseling might decrease failure rates and improve switching behavior. The findings suggest that there is a need to adopt strategies aiming to ensure better use compliance and longer duration of use together with strategies to increase contraceptive prevalence.

1. Introduction

Since 1990, the total fertility rate (TFR) in Egypt has been slowly declining, from 4.1 in 1991 to 3.5 in 2000 and 3.0 in 2008, but it unexpectedly increased to 3.5 in the Egypt 2014 Demographic and Health Survey (EDHS 2014). Between 2008 and 2014 the level of contraceptive use dropped slightly, from 60% to 58%. The proportion of IUD users declined from 36% to 30%, and the proportion of pill users increased from 12% to 16%. The United Nations Development Program (UNDP) concluded that “with the current decline in the level of usage (of contraception), it is unlikely for Egypt to achieve, on both the national and local levels, the MDG target relating to a contraceptive prevalence rate of 72%, which is the rate necessary to achieve the total fertility rate (TFR) of 2.1 children per woman by 2015 (UNDP and the Ministry of National Planning 2015).”

Accordingly, the Strategic National Population Plan 2015-2030 in Egypt has called for accelerated efforts to reduce the TFR to 2.4 births per woman by the year 2030. Theoretically, such a fertility level can be achieved by increasing contraceptive prevalence from 58% in 2014 to 72%, reducing the discontinuation rate (within 12 months of use) from 30% in 2014 to 18%, and reducing the proportion of unmet need for family planning from 13% to 6% (National Population Council 2015). In order to achieve this target, the family planning program must maintain good quality of family planning service provision and ensure that attitudes favorable to the use and acceptance of contraception are maintained. However, this target should be viewed as ambitious, considering the rising cost of ensuring contraceptive security as a result of the large increase in Egypt’s population.

1.1. Background

The family planning literature has emphasized that “contraceptive discontinuation is an important determinant of contraceptive prevalence, as well as unwanted fertility and other demographic impacts” (Bradley et al. 2009). The several types of contraceptive discontinuation that are often studied, such as method failure, switching, and abandonment, are behaviors that result from decisions contraceptive users take while already using a method. These decisions are determined by two groups of factors. First is the quality of family planning service provision. Although causal linkages between contraceptive discontinuation rates and the quality of family planning programs cannot be established in this analysis, earlier studies (e.g., Blanc et al. 2002) have indicated high correlations between evaluations of family planning efforts and discontinuation rates, particularly abandoning contraceptive use while still in need of family planning. Blanc et al. suggested, “The all-method discontinuation rate for quality-related reasons emerges as the most likely candidate for a summary measure of quality of care,” a result that highlights the importance of identifying the reasons of discontinuation for the purpose of program evaluation and finding solutions to reduce unmet need.

The second group of factors is related to women’s background characteristics. “Along with the contraceptive method chosen, women’s demographic and socioeconomic characteristics have also

been found to be associated with contraceptive discontinuation and failure” (Bradley et al. 2009). In Egypt, all discontinuation studies have examined the discontinuation rates by background characteristics of women. In 1995, El Tawila showed that discontinuation is less likely among older women, women who had at least one living son, and women who did not intend to bear more children within 2 years (El Tawila 1995). Another study found that discontinuation rates were higher among rural women, those with no education, and the poorest group of women (Way 2003). Also, research has shown that women without education, younger women, women with one child, and poor women in rural Upper Egypt are more likely to discontinue by abandoning use while still in need of family planning than to switch to another method (Sayed and Abdel Aziz 2011).

Choices that family planning users make may have an impact on contraceptive discontinuation, which is now considered a challenge facing the realization of the goals of the recent initiative FP2020. The initiative aims at reducing the level of unmet need for family planning. “When users discontinue use because of method- or service-related problems, they are at risk for unintended pregnancies. Improving continuation is a particular challenge because it requires advances in many areas simultaneously, including logistics, counseling, quality of care, and choice (Stover and Sonneveldt 2017). Women who continue to use a contraceptive method without interruption while they are in need are more likely to fulfill their goals of limiting or spacing births. Switching between contraceptive methods will have an effect on the level of fertility depending on the timing of adopting the destination method and whether the switching was to a more effective or to a less effective method. Also, the risk of getting pregnant while using a contraceptive method is determined by the effectiveness of the method and is also due to incorrect use of the method. El Tawila (1995) found that failure rates related to incorrect use were quite high among pill users in Egypt, since pills require more skill to be used effectively.

All of these behaviors contribute to what Jain and colleagues have termed the “leaking bucket” that reduces the impact of family planning programs (Jain (2014a) in Castle and Askew 2015). In Egypt, the only estimate of this effect was made by Way (2003), who assessed the overall magnitude of the impact that contraceptive failure and abandonment has on fertility in Egypt. Using the calendar data of the EDHS 2000, she estimated that “If all births due to contraceptive failure or following a segment of use in which use of a method was abandoned because of method- or service-related issues had been prevented during the three-year period before the EDHS, the TFR would have dropped to 2.8 births, roughly 20 percent lower than the actual rate” (Way 2003).

In addition, understanding the reasons behind these different patterns of behavior make the consideration of contraceptive dynamics, and addressing them effectively, an important component of family planning programs by introducing interventions that can complement the efforts aiming to reduce unmet need and increase the prevalence of modern contraceptive methods. Contraceptive discontinuation rates can help indicate how well the family planning program is achieving its goals, as evidenced by changes in the prevalence of unintended pregnancies. They also can indicate the extent to which a program is meeting users’ needs and addressing their

expectations and concerns, because the all-method discontinuation rate for quality-related reasons is associated with the quality of care a woman receives during her visit to the family planning center (Blanc et al. 2002).

Quality of care can affect contraceptive discontinuation starting when the method is first prescribed and also during regular follow-up visits. Blanc et al. (2002) note that as fertility declines, it would be more beneficial if the family planning program shifted its emphasis from increasing the number of contraceptive users to improving services to reduce the discontinuation rates. This strategy has not been addressed by the Egypt family planning program. The above-mentioned national strategic objective of Egypt to reduce fertility was supported by six sub-objectives, among them improving the skills of family planning service providers. However, none of the programs and activities listed in the executive plan mentioned the need to improve the quality of counseling skills in order to influence contraceptive discontinuation and/or switching.

The trend of the 12 months discontinuation rate in Egypt declined from 30% in 2000 to 26% in 2008 but then noticeably increased to 30% in 2014 (EDHS 2008, 2014). This is calculated by constructing a life table to estimate the probability of stopping the use of the contraceptive method within 12 months of beginning use, measured during the 5-year period before the survey. At the same time, the percentage of users who experienced method failure within 12 months of beginning use was 3% in 2008 and increased to 4% in 2014 (EDHS 2008, 2014).

The current research aims to provide an in-depth assessment of changes in contraceptive dynamics among ever-married Egyptian women based on data from the 2008 and 2014 EDHS surveys. Specifically, the study focuses on the following:

1. Calculating contraceptive discontinuation and switching for each specific contraceptive method.
2. Identifying differentials in contraceptive discontinuation and switching by user's background characteristics.
3. Determining women's contraceptive use status after discontinuation according to background characteristics.

1.2. Research Questions

This study analyzes behaviors by women who reported use of contraception during the last 5 years before the survey. It assumes a relationship between their background characteristics and their dynamic family planning experience, demonstrated through the progressive segments of contraceptive use and non-use. Women who entered the family planning program and used a contraceptive method made different choices. While some continued to use their method, others switched to another method or abandoned contraceptive use. The discontinuation act could have happened among those using the first prescribed method and also among those who switched to another method. Discontinuation is a behavior that follows a decision that could be taken by those

who are no longer in need of family planning and also by those who abandon use while still having a need. Abandoning use of a method while in need of contraception will add to the existing level of unmet need and will have an effect on the TFR, as these women face the risk of becoming pregnant during the duration of the discontinuation period.

Reasons women give for discontinuing contraceptive use, for switching, and for abandoning use while in need, whether for specific methods or overall, can guide the family planning program and help improve the efficiency of counseling services. Also, by identifying the specific background characteristics associated with contraceptive discontinuation, the program would be more able to satisfy women's needs and ensure continuation of contraceptive use. However, these reasons are dynamic and differ across countries and over time. They are a product of differences and changes within the cultural, economic, social, and political environment in the country. Previous studies in Egypt regarding discontinuation dynamics were conducted during periods of increasing contraceptive prevalence and decreasing TFR. However, the current study will consider discontinuation dynamics during a period of unexpected increase in TFR and a drop in contraceptive prevalence within a mature family planning program.

This study addresses the issue of contraceptive dynamics among Egyptian women and answers the following questions:

1. What is the pattern of contraceptive discontinuation and switching (level and trend between 2008 and 2014) for each contraceptive method?
2. What are the main reasons for discontinuation/switching? Have these reasons changed over the study period?
3. What are the differentials in the contraceptive use status after women discontinued a method, by women's socioeconomic characteristics?

2. Data and Methods

2.1. Data

The analysis of this study is based on data from EDHS 2008 and EDHS 2014. The sample design of the two surveys ensures that information on various population and health indicators of interest are provided for the country as a whole and for six major subdivisions (Urban Governorates, urban Lower Egypt, rural Lower Egypt, urban Upper Egypt, rural Upper Egypt, and the Frontier Governorates). Both EDHS 2008 and EDHS 2014 have a multi-stage sample design. The sample for the 2014 EDHS was explicitly designed to allow for separate estimates of most key indicators at the governorate level (EDHS 2008, 2014).

A total of 16,571 in the 2008 EDHS and 21,903 women in the 2014 EDHS were identified as eligible to be interviewed. Among these women, 16,527 and 21,762 were successfully interviewed in the 2008 and 2014 EDHS, respectively. The response rate was 94.0% in 2008 and 99.7% in 2014 (EDHS 2008, 2014).

The study uses data from the contraceptive calendar of the 2008 EDHS and 2014 EDHS. The details of all segments of contraceptive use were recorded in the contraceptive calendar data as reported by women who used contraception during the last 5 years before the DHS survey. The calendar contains information about monthly contraceptive use and birth history for the previous 5 years for ever-married women who used a contraceptive method. For each month, the respondent was requested to indicate whether she was pregnant or gave birth, had a terminated pregnancy, or used a contraceptive method. Women who used a method were asked to specify the contraceptive method used and, if more than one method was used during the month, the most effective method was recorded (ICF International 2012). If the respondent stopped using a method in that month, she was asked to give a reason for this discontinuation.

The data files used are data of ever-married women age 15-49 from both EDHS 2008 and EDHS 2014. The sample from EDHS 2008 included 7,597 women who experienced 10,704 use segments. The pill was used in 26% of these segments, the IUD in 45%, injectables in 15%, and other methods in 13% of the segments. In EDHS 2014, the sample included 10,570 women who experienced 15,236 use segments. The distribution of these segments by method was: 40% pills, 36% IUD, 17% injectables, and 8% other methods. The segment of use is the unit of the analysis. The distribution of the segments by women's background characteristics for 2008 and 2014 is presented in the Appendix 1. The table shows that there are enough segments to allow for the examination of discontinuation rates for all categories except for those in the Frontier Governorates in both EDHS 2008 and EDHS 2014. Therefore, these categories will be excluded.

2.2. Variables Used in the Analysis

The key variables of interest are calendar data for pregnancies and contraception, reason for discontinuation, and century monthly code (CMC) start of calendar. The respondent characteristics are classified into two categories: 1) Characteristics at time of interview (we assumed they are the same at the time of discontinuation): highest educational level, region, type of place of residence, wealth index. 2) Characteristics at initiation of use: women's age and total number of living children (changing across segments for the same woman). The date of initiation of use for each segment in CMC was calculated, and then women's age at the initiation of use was calculated by subtracting the date of the initiation of use in CMC from her date of birth in CMC, and the outcome was divided by 12 months to obtain women's age in years. The total number of living children at initiation of use was computed by summing the number of living children for those dates of birth in CMC that happened before the date of initiation of use in CMC.

2.3. Statistical Analysis

Single/multiple decrement life tables were built to examine various net rates of contraceptive discontinuation by reasons, and women's behavior after discontinuation (no longer in need; method failure; switched to another method; abandoned use while in need). These reasons for discontinuation or status after discontinuation are treated as competing risks and discontinuation probabilities in months are additive across the reasons for discontinuation and status after discontinuation. If there are less than 125 unweighted segments of use for a method, rates for that method are not shown (Rutstein and Rojas 2006).

The segments of contraceptive use used to construct life tables are those that began 3-59 months prior to the survey. The period 0-2 months prior to the interview is excluded from the analysis to eliminate any bias that might be introduced by unrealized pregnancy (Rutstein and Rojas 2006). Segments of use that started before the beginning of the calendar and 59 months prior to the survey are also excluded to ensure a consistent study time period between the 2008 and the 2014 surveys, since the segments of use began from 3-59 months prior to the survey in the 2008 survey, while it began from 3-62 months prior to the survey in 2014, and a woman may contribute more than one episode during the study period. The study used Greenwood's formula to estimate the asymptotic standard error of $S(t)$ "cumulative survival function" (Kalbfleisch and Prentice 2002) and used STATA command *stcompet* (Coviello and Boggess 2004) to estimate the standard error for each reason-specific 12 months discontinuation rate. The study used the estimated standard errors to test the null hypothesis that there is no significant difference in the discontinuation rates between the 2008 survey and the 2014 survey.

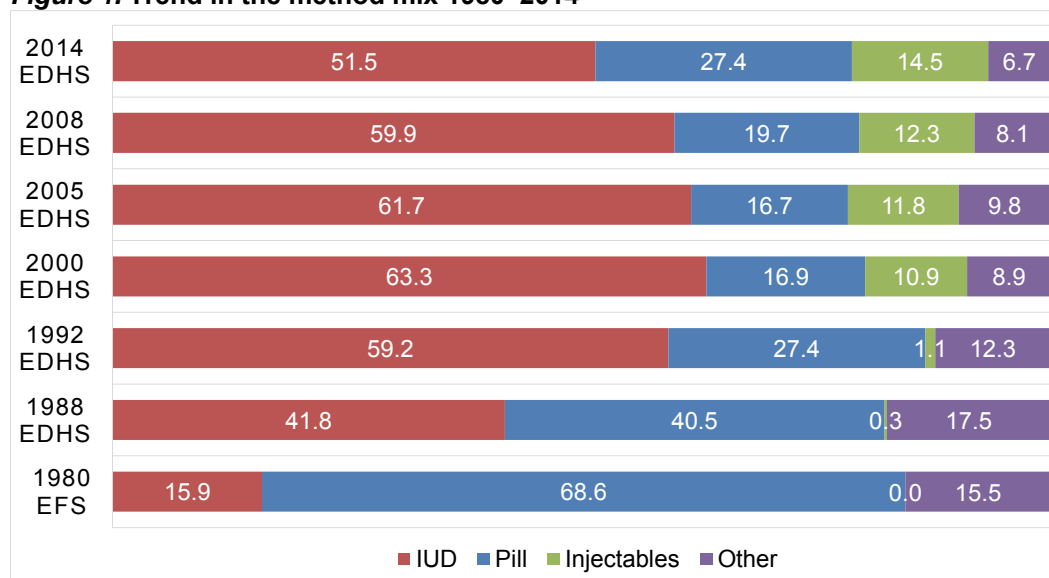
3. Results

3.1. Trend in Discontinuation Rates by Contraceptive Method

Since 1980, pills and the IUD have been the most commonly used contraceptive methods in Egypt, representing more than 80% of the method mix. In 1988, the IUD emerged as the most common method and has remained so from 1988 to 2014, in spite of a recent decrease in its share from 60% to 51% in the last inter-survey period (i.e., since EDHS 2008). In 1995, injectables were introduced and accounted for 11% of the method mix in the 2000 EDHS, increasing to 15% in EDHS 2014. Between 2008 and 2014, a little change in the method mix was observed with an increase in the use of hormonal methods (pills and injectables) and a decline in the IUD share, as Figure 1 shows.

This study will focus on the discontinuation of the three most widely used contraceptive methods: IUD, pills, and injectables. These three methods together accounted for 92% of the method mix in EDHS 2008 and 93% in EDHS 2014, while other modern methods and traditional methods are not common, and the number of use segments does not allow for a life table analysis. The remaining methods in current use accounted for about 8% in EDHS 2008 (1% condoms, 2% female sterilization, 1% other modern methods, and 4% traditional methods including prolonged breastfeeding), and 7% in EDHS 2014 (1% condoms, 2% female sterilization, 1% other modern methods, and 3% traditional methods including prolonged breastfeeding) (EDHS 2008, 2014). It is clear that the changes in the method mix will have implications for discontinuation, as the overall discontinuation rate is a weighted average of the method-specific discontinuation rates, with the weights changing with changes in the method mix.

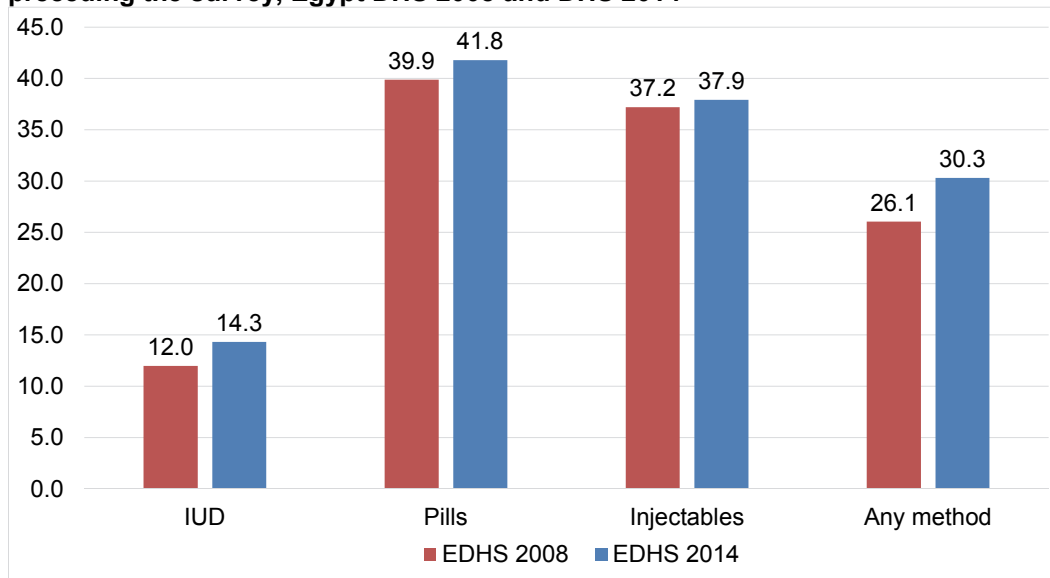
Figure 1. Trend in the method mix 1980–2014



One way of measuring the duration of a contraceptive segment is by looking at the median duration of use calculated from the life table as the time when 50% of the users had stopped using the

method. The median duration of contraceptive use was 24 months at the time of the 2008 DHS and dropped to 22 months at the time of the DHS 2014, as Figure 2 shows. The median time to discontinuation has dropped for all contraceptive methods. Although IUD users have the longest duration of use, the median duration of use has dropped from 35 months in the 2008 survey to 33 months in the 2014 survey. For pill users, the median duration of use has dropped from 17 months to 16 months. Among injectable users, the median duration of use remained almost constant at 20 months.

Figure 2. Median duration of use by contraceptive method during 5 years preceding the survey, Egypt DHS 2008 and DHS 2014



The other way of looking at the duration of use is by using the life table discontinuation rates, as Table 1 shows. The 12 months discontinuation rate in the 2014 survey is 30% for all methods. It is lowest for the IUD segments (14%), and highest for the pill segments (42%) followed by injectables (38%) The magnitude of the current increase is about 4.3 percentage points for all methods. The increase was 2.3, 1.8, and 0.7 percentage points for the IUD, pill, and injectable segments respectively.

All life table discontinuation rates have significantly increased in the 2014 survey compared with the 2008 survey with the exception of injectables, which were unchanged or down at 6, 18, and 36 months. By the end of the second year, more than one-third of the IUD segments, about 40% of the pill segments, and about 38% of the injectable segments were discontinued in both the 2008 and 2014 surveys. By the end of 3 years, slightly more than half of the IUD segments, about two-thirds of the pill segments, and about 70% of the injectables segments were discontinued.

In both surveys the discontinuation rates for the hormonal methods (pills and injectables) are always higher than for the IUD, and the pattern of discontinuation for the IUD is different than for the hormonal methods. Discontinuation rates for the IUD segments by 12 months of use, although

lower for the hormonal methods, increase about 2.5 to 3 times by the end of the second year and almost four times by the end of the third year. On the other hand, discontinuation of the hormonal methods starts at high levels within the first year of use, increases about 50% in the second year, and reaches 85% by the end of the third year. It is common practice to use the 12 months discontinuation rate for comparison at the local level, and it will be used for the rest of this paper.

Table 1. Discontinuation rates for 6, 12, 18, 24, and 36 months by contraceptive method during 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

Period	IUD			Pills			Injectables			All methods ¹		
	2008	2014	Δ (2014- 2008)	2008	2014	Δ (2014- 2008)	2008	2014	Δ (2014- 2008)	2008	2014	Δ (2014- 2008)
6 months	5.4	6.3	0.9***	26.9	27.9	1.0***	26.7	25.2	-1.5***	15.4	18.3	2.9***
12 months	12.0	14.3	2.3***	39.9	41.8	1.9***	37.2	37.9	0.7***	26.1	30.3	4.3***
18 months	21.7	26.4	4.7***	52.6	55.0	2.4***	47.3	46.8	-0.4***	38.0	43.0	5.0***
24 months	34.0	37.3	3.3***	63.6	65.7	2.1***	55.2	56.3	1.1***	50.1	53.6	3.5***
36 months	51.8	53.6	1.8***	75.1	78.0	2.9***	69.8	69.6	-0.2***	64.5	67.4	2.9***
Total Segments	4833	5505		2880	6038		1609	2524		10704	15236	

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

¹ All methods include IUDs, pills, injectables, condoms, female sterilization, and other modern and traditional methods.

Note: Figures are based on life table calculations using information on segments of use that began 3-59 months prior to the survey.

3.2. Discontinuation Rates by Background Characteristics of Women

Table 2 shows that the recent significant increase in the 12 months discontinuation rates between EDHS 2008 and EDHS 2014—with an overall average of 4.3 percentage points—has occurred among segments for all background groups, with only two exceptions: Discontinuation rates have dropped in urban Upper Egypt and among women in the highest wealth index quintile. Urban Upper Egypt is the only region where the discontinuation rate has dropped significantly (about 3 percentage points), which could indicate improvement in the quality of family planning services. On the other hand, it is clear that the increase in the discontinuation rate has been greatest for women with one or two children, in rural areas, in Lower Egypt, in rural Upper Egypt, and in the lowest, low, and middle wealth index quintiles.

Table 2. Twelve months life table discontinuation rates by background characteristics¹ during 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

Background characteristics	2008	2014	Δ (2014-2008)
Age			
15-24	30.3	35.0	4.7***
25-34	23.6	27.9	4.4***
35-49	22.7	26.1	3.4***
Number of living children			
One	36.9	42.6	5.6***
Two	22.6	28.0	5.4***
Three	20.1	24.2	4.1***
Four or more	22.1	24.2	2.1***
Urban-rural residence			
Urban	24.3	25.0	0.8***
Rural	27.2	32.8	5.6***
Place of residence			
Urban Governorates	22.8	24.9	2.1***
Lower Egypt	23.3	28.5	5.2***
Urban	21.2	23.5	2.3***
Rural	23.9	29.7	5.8***
Upper Egypt	30.9	34.6	3.7***
Urban	29.2	26.6	-2.6***
Rural	31.6	37.7	6.1***
Level of education			
No education	24.7	28.3	3.7***
Less than primary	28.5	33.1	4.6***
Primary complete, some secondary	26.7	31.6	4.9***
Secondary/higher	26.1	30.3	4.2***
Wealth index quintiles			
Lowest	26.9	33.6	6.6***
Low	27.3	33.6	6.3***
Middle	26.5	32.0	5.5***
High	25.1	27.6	2.5***
Highest	24.6	24.2	-0.4***
Total	26.1	30.3	4.3***

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

¹All methods include IUD, pills, injectables, condom, female sterilization and other modern and traditional methods. Note: Figures are based on life table calculations using information on segments of use that began 3-59 months prior to the survey.

It is worth noting that changes by region of residence are extreme. The increase in the 12 months discontinuation rates between the two surveys is evident in the rural areas, at about 5.5 percentage points (from 27% to 33%) but very small in the urban areas (from 24% to 25%). In Lower Egypt, the rise in the 12 months discontinuation rate reached 5.3 percentage points (from 23% to 28%), while in Upper Egypt the increase was less, at 3.8 percentage points (from 31% to 35%). Within both regions, the urban-rural differential has increased.

Differentials in the discontinuation rates by contraceptive method are shown in Appendix 2. In general, discontinuation rates have significantly changed among all categories, with a different pattern for each contraceptive method. Discontinuation rates among IUD segments have increased

significantly for all categories except among urban women, especially in urban Upper Egypt. Among pill segments, the 12 months discontinuation rates have significantly dropped among older women, women with three or more children, women in urban Lower Egypt and in urban Upper Egypt, and women in the highest wealth quintile. Among segments of injectables, the discontinuation rates have significantly dropped for women with two children, women in the Urban Governorates, women in Lower Egypt (both urban and rural areas), and women in the high and highest wealth quintiles.

Appendix Table 2 shows that discontinuation rates have increased for segments in almost all age groups for all contraceptive methods. It is interesting to note the significant increase in discontinuation rates between the 2008 and 2014 surveys among IUD and pill segments for women with two children and the significant decrease among injectables segments. The increase is smaller among IUD segments (from 9% to 11%) than pill segments for women who have two children (from 31% to 39% in 2008 and 2014 respectively), while for injectables it decreased significantly for women with one or two children.

Discontinuation rates have increased among segments for women in all education groups for all contraceptive methods, except among women with a secondary or higher education using injectables. The discontinuation rate for this group has decreased from 49% to 42%, a significant drop of 6.8 percentage points. Similarly, discontinuation rates have increased among women in all wealth quintiles; the only exception was among users of pills and injectables in the high and the highest wealth quintiles. Among women in the highest wealth category, the discontinuation rate for pill segments dropped from 42% to 34% and for injectable segments, from 47% to 36% among women in the high wealth quintile and from 54% to 43% in the highest quintile.

From Appendix Table 2 we can also conclude that in the 2014 survey those IUD and pill users more likely to discontinue use within the first year of use are young, have one or two children, live in rural areas, especially in Upper Egypt, are less educated, and are in the lowest three wealth quintiles. The probability of discontinuing use for users of injectables within the first year is high among young women, women who have one or two children, women who live in urban areas, especially in urban Upper Egypt, and those in the highest wealth quintile.

3.3. Reasons for Discontinuation of Contraceptives

A classic conceptual framework for describing the impact of family planning programs on fertility was presented by Bertrand and others (Bertrand et al. 1996). The framework recognizes that fertility and other impacts are the consequence of both the demand for and supply of family planning services. Both the demand for children and demand for family planning services are affected by a number of political, socioeconomic, cultural, and individual factors. The family planning supply environment is also shaped by the political and administrative systems within which the program operates. Inputs to the family planning program are transformed through

program activities that collectively create the principal program outputs—accessibility, quality of care, and range of services. These outputs attract clients to the program and, jointly with demand for family planning, shape the behavior of family planning users and hence determine the impact of the program on the target population.

The EDHS calendar data includes the reasons respondents give for discontinuing use for each segment. This allows us to analyze differences in trends of discontinuation for reasons related to both “supply” and “demand” factors in discontinuation. Five main reasons are considered in the analysis and each includes specific responses as follows:

1. Contraceptive failure: became pregnant while using the method.
2. Side effects/health concerns: had side effects or health concerns.
3. Other method/service-related reasons¹: wanted a more effective method, lack of access/too far, cost too much, inconvenient to use, husband disapproved, and up to God/fatalistic and other.
4. Desire to get pregnant: wanted to become pregnant
5. Not exposed to pregnancy: marital dissolution/separation, difficult to get pregnant/menopausal, infrequent sex/husband away.

These five reasons for discontinuing contraceptive use can be further aggregated to reflect the two main groups of factors that influence a woman’s decision whether to stop or continue using a method. As family planning users assess the quality of the services they receive and the suitability of the method they are using, they also consider their needs and assess the level of their demand for these services. This process is dynamic, and therefore discontinuation decisions will shift accordingly. The first three reasons can be considered as “supply” factors, related to methods or services, while the last two can be considered as “demand” factors, related to reduced need for contraception.

The first category, reasons related to methods and services includes: contraceptive failure, side effects/health concerns and other reasons such as the desire for a more effective method. The second category, reduced need for contraception, includes the woman’s desire to get pregnant or her personal assessment that she is not exposed to the risk of pregnancy. Although these two categories may seem broad, the categorization serves the purpose of simply differentiating between elements related to family planning service delivery and those related to women’s family planning desires and needs.

¹ Although the responses “husband disapproved” and “up to God” are not service-related, they were added to this reason because of their small share. “Husband disapproved” was 0.5% and 0.6% in the 2008 and 2014 surveys respectively, and “up to God” was 0.1% and 0.2%.

3.3.1 All-method discontinuation rates by reason for discontinuation

Figure 3 presents the change in the all-method discontinuation rates by the two broad categories of reasons for discontinuation. The “method/service-related” category has remained almost unchanged, at about 18% in both surveys, while the “reduced need” category has significantly increased, from 8% in 2008 to 12% in 2014. There has been a meaningful shift in the reasons for discontinuation away from reasons related to contraceptive methods and services and toward need-based reasons.

Figure 3. Grouped reason-specific 12 months discontinuation all-method rates, 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

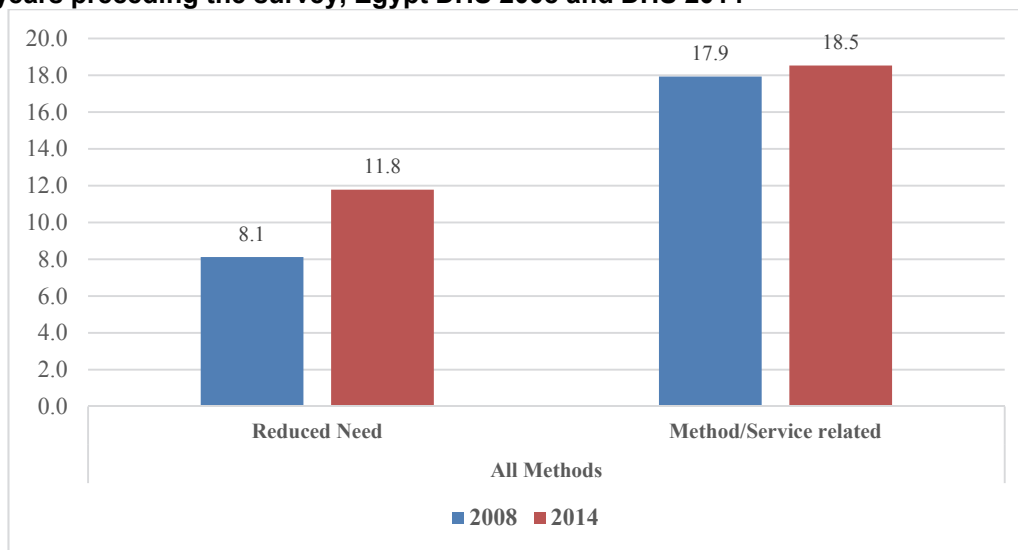


Table 3 presents the 12 months discontinuation rates by women’s reasons for discontinuing. It is clear that the ranking of the cited reasons for discontinuation has significantly changed between the surveys in 2008 and 2014. The first reason, which has the highest specific discontinuation rate, was side effects/health concerns, at 10% and 11% in 2008 and 2014 respectively. The second ranking reason reflects changing patterns between surveys, most notably in two specific reasons for discontinuation. In the 2008 survey the discontinuation rate for other method/service-related reasons was 6%, and it significantly dropped to 3% in 2014. At the same time, the largest observed increase was among segments that discontinued for a need-based reason, desire to get pregnant, which significantly increased from 4% in the 2008 survey to 6% in the 2014 survey, becoming the second-highest reason-specific discontinuation rate.

The other component of the need-based discontinuation rate, not exposed to pregnancy, also significantly increased to become the third largest-reason for the increase in discontinuation rates between surveys. This result reflects a drop in the “demand” element of the family planning model. On the other hand, Table 3 shows that the almost unchanged discontinuation rates for segments due to method/service-related reasons is a result of an increase in contraceptive failure and in side

effects/health concerns—both of which are related to the quality of counseling—offset by the drop in other method/service-related reasons—which are related to contraceptive logistics and accessibility. This result suggests that while the cost and accessibility of family planning methods and services have become less likely to cause discontinuation, counseling regarding side effects of contraceptive methods is still an issue that is likely to provoke discontinuation. Thus the overall effect of “supply” elements on discontinuation rates has remained unchanged.

Table 3. Reason-specific 12 months discontinuation rates during 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

Reason	All Methods		
	2008	2014	Δ (2014-2008)
Method/service-related reasons	17.9	18.5	0.6***
Contraceptive failure	2.9	4.3	1.4***
Side effects/health concerns	9.5	10.8	1.4***
Other method/service-related reasons	5.6	3.4	-2.2***
Need-based reasons	8.1	11.8	3.7***
Desire to get pregnant	4.4	6.3	1.9***
Not exposed to pregnancy	3.7	5.5	1.8***
All reasons discontinuation rates	26.1	30.3	4.3***
Number of segments	10704	15236	

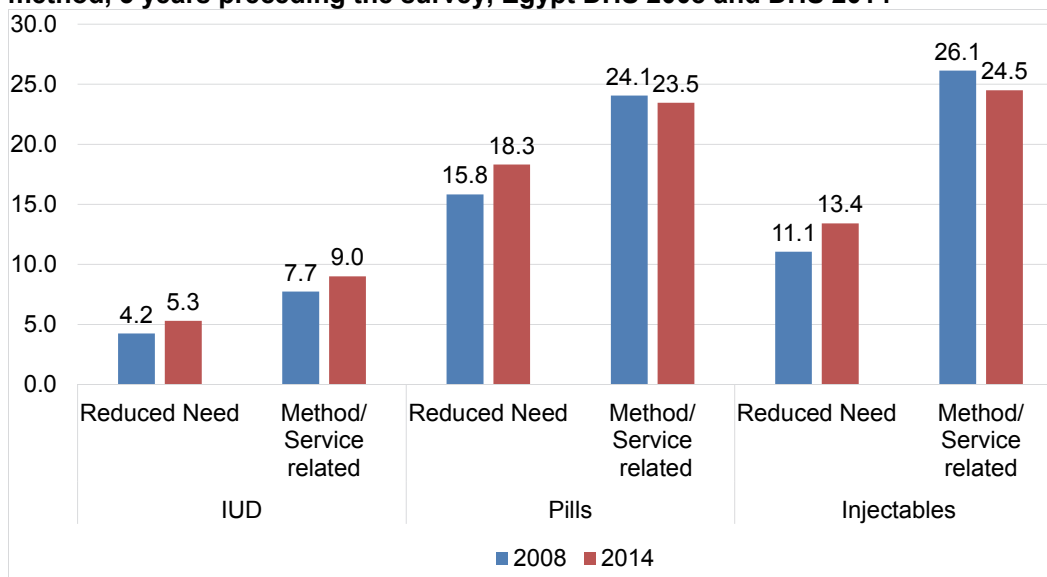
* p<.05, ** p<.01, *** p<.001

3.3.2 Method-specific discontinuation rates by reason for discontinuation

Figure 4 shows reasons for discontinuation for all segments of use that were discontinued within the first year by contraceptive method during the 5 years preceding the survey for the 2008 and 2014 surveys. The figure highlights several points of interest. First, it shows that the segments of use are more likely to be discontinued due to method/service-related reasons than due to reasons of reduced need for all three contraceptive methods in both surveys. The second point of interest is that the “reduced need” reason has increased for all three methods. This increase is especially large among pill segments, which significantly increased from 16% to 18% between surveys, and for injectable users from 11% to 13%.

Third, Figure 4 shows that the discontinuation rate for method/service-related reasons increased slightly for IUD use segments (from 8% to 9%), but decreased slightly for hormonal methods. For the pill segments, it dropped from 24.1%, to 23.5%, and for injectable segments there was a drop from 26% to 25%. This result may indicate that discontinuing the use of pills and injectables has become more responsive to demand factors, while discontinuation among IUD users has remained motivated by both demand and supply factors.

Figure 4. Grouped reason-specific 12 months discontinuation by contraceptive method, 5 years preceding the survey, Egypt DHS 2008 and DHS 2014



While Table 4 shows that the reported reasons for discontinuation differ among the methods, as might be expected, “side effects and health concerns” remain the major reason for discontinuation for all three contraceptive methods in both survey years. There has been a significant drop in discontinuation for this reason among pill and injectables segments, however, and a significant increase among IUD segments. On the other hand, “desire to get pregnant” has significantly changed, with a reason-specific discontinuation rate of 4%, 9%, and 6% in the 2014 survey among IUD, pill, and injectable segments respectively, compared with 3%, 7%, and 5% in the 2008 survey. Discontinuation-specific rates due to method failure (becoming pregnant while using the method) have significantly increased for all methods, with the pill segments having the highest rates and the IUD segments having the lowest.

Table 4. Reason-specific 12 months discontinuation rates during 5 years preceding the survey by contraceptive method, Egypt DHS 2008 and DHS 2014

Reason	IUD			Pills			Injectables		
	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)
Method/service-related reasons	7.7	9.0	1.3***	24.1	23.5	-0.6***	26.1	24.5	-1.6***
Contraceptive failure	0.9	1.2	0.3***	6.0	7.7	1.7***	0.9	1.4	0.5***
Side effects/health concerns	6.1	7.5	1.5***	12.3	11.1	-1.2***	21.3	21.1	-0.2***
Other method/service-related reasons	0.7	0.3	-0.5***	5.8	4.7	-1.1***	3.9	2.0	-1.9***
Need-based reasons	4.2	5.3	1.1***	15.8	18.3	2.5***	11.1	13.4	2.4***
Desire to get pregnant	3.3	4.3	1.0***	7.3	8.6	1.3***	5.2	6.1	0.9***
Not exposed to pregnancy	0.97	1.0	0.04***	8.6	9.7	1.2***	5.9	7.3	1.4***
All reasons discontinuation rates	12.0	14.3	2.3***	39.9	41.8	1.9***	37.2	37.9	0.7***
Number of segments	4833	5505		2880	6038		1609	2524	

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

3.4. Reasons for Discontinuation by Women's Background Characteristics

Table 5 presents reason-specific discontinuation rates for the two broad categories, classified by women's background characteristics. In the 2008 survey, the all-method discontinuation rate due to method/service-related reasons was 18%, and remained almost constant in the 2014 survey. On the other hand, the all-method discontinuation rate due to reduced need for contraception increased from 8% to 12%. This trend is clear and significant across all background categories. Moreover, Table 5 shows that the increase in the all-method discontinuation rates due to reduced need is high (above average) among women with one or two children, women living in rural areas, women in rural Upper Egypt, women with primary education, and women in the lowest, low, and middle wealth index quintiles.

Also, although the all-method discontinuation rate due to method/service-related reasons has changed only slightly, some increases have occurred among women with certain background characteristics: women age 25-34, women with three children, women in rural areas, women in urban and rural Lower Egypt, and women in the lowest wealth quintile. The rate has decreased in Upper Egypt and, especially, in urban Upper Egypt.

Another concern is the high value of this indicator for the Urban Governorates, where family planning services are expected to be of the highest quality. About 17% of contraceptive users discontinue using the method within 1 year of initiating use because of method/service-related reasons. In 2008, urban Upper Egypt had the highest rate (22%), while urban Lower Egypt (14%) had the lowest rate. In 2014, an opposite pattern was evident, with the highest discontinuation rate due to method/service-related reasons found in rural Upper Egypt (22%) and the lowest rate in urban Lower Egypt (15%). This is a significant indication of a perceived improvement in the quality of family planning services in urban Upper Egypt, where discontinuation within the first year of contraceptive use due to method/service-related reasons became less likely than in the Urban Governorates.

As mentioned, the current contraceptive method mix has an impact on the discontinuation rates. The grouped reason-specific discontinuation rates for each of the three main contraceptive methods are presented in Appendix 3, which can help establish whether the pattern discussed above exists among users of the three main contraceptive methods.

Table 5: All-method discontinuation rates by reason for discontinuation and background characteristics 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

Background characteristics	Reduced need			Method/Service-related			Total discontinuation rates	
	2008	2014	Δ	2008	2014	Δ	2008	2014
			(2014-2008)			(2014-2008)		
Age								
15-24	9.1	14.3	5.1***	21.2	20.7	-0.5***	30.3	35.0
25-34	7.3	9.8	2.5***	16.2	18.1	1.8***	23.6	27.9
35-49	7.9	11.9	4.0***	22.4	23.0	0.7***	30.3	35.0
Number of living children								
One	13.1	18.0	4.9***	23.9	24.6	0.8***	36.9	42.6
Two	5.9	11.0	5.1***	16.8	17.0	0.2***	22.6	28.0
Three	5.8	8.0	2.2***	14.3	16.2	1.9***	20.1	24.2
Four or more	6.7	8.6	1.9***	15.4	15.6	0.2***	22.1	24.2
Urban-rural residence								
Urban	6.6	8.7	2.1***	17.6	16.3	-1.3***	24.3	25.0
Rural	9.1	13.2	4.1***	18.1	19.6	1.4***	27.2	32.8
Place of residence								
Urban Governorates	6.2	8.0	1.8***	16.6	16.8	0.3***	22.8	24.9
Lower Egypt	8.3	10.8	2.6***	15.0	17.7	2.6***	23.3	28.5
Urban	7.2	8.0	0.8***	14.0	15.5	1.5***	21.2	23.5
Rural	8.6	11.5	2.9***	15.3	18.2	2.9***	23.9	29.7
Upper Egypt	8.9	14.3	5.5***	22.0	20.3	-1.7***	30.9	34.6
Urban	6.9	10.2	3.3***	22.2	16.4	-5.8***	29.2	26.6
Rural	9.7	15.9	6.2***	21.9	21.8	-0.1***	31.6	37.7
Level of education								
No education	7.6	10.3	2.7***	17.1	18.1	1.0***	24.7	28.3
Less than primary	7.9	11.8	3.9***	20.6	21.3	0.6***	28.5	33.1
Primary complete, some secondary	8.0	12.8	4.8***	18.7	18.8	0.1***	26.7	31.6
Secondary/higher	8.5	12.0	3.5***	17.7	18.4	0.7***	26.1	30.3
Wealth index quintiles								
Lowest	6.8	12.0	5.1***	20.1	21.6	1.5***	26.9	33.6
Low	9.0	14.5	5.5***	18.3	19.1	0.8***	27.3	33.6
Middle	8.3	13.3	5.0***	18.2	18.7	0.5***	26.5	32.0
High	7.6	9.7	2.2***	17.5	17.9	0.4***	25.1	27.6
Highest	8.9	8.7	-0.2***	15.7	15.5	-0.2***	24.6	24.2
Total	8.1	11.8	3.7***	17.9	18.5	0.6***	26.1	30.3

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

3.5. Status after Discontinuation of Contraceptive Method

In this section, the analysis is concerned with the contraceptive use status of women after 1 month of discontinuation. The main concern is whether the act of discontinuing a contraceptive method has left a user at risk of an unintended pregnancy. We assume that women who reported that they are no longer in need of using a contraceptive method (whether wanting to become pregnant or following their own assessment of inability to become pregnant) are not at risk of pregnancy. Those

who reported method failure are currently pregnant, and the resulting pregnancy is considered to be unintended.

Women who reported discontinuing contraceptive use for reasons related to method/service have either abandoned use while in need of family planning and are therefore at risk of an unintended pregnancy or have discontinued use to switch to another contraceptive method and thus subject to a relative risk of unintended pregnancy depending on the effectiveness of the new method adopted. Switching to a more effective method will reduce the risk while switching to a less effective method will increase it.

As the overall discontinuation rate increases to reach 30% in 2014, it becomes necessary to look into the probabilities that the discontinuers will belong to a particular status after discontinuation, which is, as mentioned above, an indication of the risk of unintended pregnancies. Table 6 displays the all-method status-specific 12 months discontinuation rates and those for the three main contraceptive methods. It shows that 8% of the use segments switched to another method in both surveys and that the “abandoned use while in need” status took place for 7.3% of the segments at the time of the 2008 survey and has significantly dropped to 6.5% at the time of the 2014 survey.

Table 6. Status-specific 12 months discontinuation rates by contraceptive method 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

Status	IUD			Pills			Injectables			All Methods		
	2008	2014	Δ (2014- 2008)	2008	2014	Δ (2014- 2008)	2008	2014	Δ (2014- 2008)	2008	2014	Δ (2014- 2008)
No longer in need	4.2	5.3	1.1***	15.8	18.3	2.5***	11.1	13.4	2.4***	8.1	11.8	3.7***
Switched in the following month	3.3	4.6	1.3***	9.6	8.3	-1.3***	11.5	11.0	-0.5***	7.76	7.77	0.01***
Contraceptive failure	0.9	1.2	0.3***	6.0	7.7	1.7***	0.9	1.4	0.5***	2.9	4.3	1.4***
Abandoned use while in need	3.5	3.2	-0.3***	8.5	7.5	-1.0***	13.7	12.1	-1.6***	7.3	6.5	-0.8***
Discontinuation rates	12.0	14.3	2.3***	39.9	41.8	1.9***	37.2	37.9	0.7***	26.1	30.3	4.3***

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

Almost the same trend is clear for all three methods of interest. The “no longer in need” rate has increased significantly, and the failure rate at which contraceptive discontinuation has left the user pregnant also has increased significantly, for all methods. It is interesting to note that among segments of all three methods, discontinuation has resulted in a decrease in the “abandoned while in need” status, which significantly decreased between the DHS surveys in 2008 and 2014. The “switched” rate significantly increased among the IUD users only, from 3% in 2008 to 5% in 2014. The switching status, while decreasing the percent of use of one method and increasing the percent of use of another, does not affect the overall contraceptive prevalence. However, as mentioned before, the impact of the switching status on fertility depends on whether the switching is to a more effective or less effective method.

The contraceptive methods have been ranked according to effectiveness². Contraceptive methods effectiveness applied by the Spectrum Model (Avenir Health 2014) was used to rank all of the family planning methods used in Egypt. In 2008, about 43% of switchers switched to a less effective method and about 57% to a more effective method (Appendix 4). In 2014, a similar distribution was observed. About 46% switched to a less effective method and about 54% to a more effective method, as Figure 5 shows. The difference between those proportions was found to be non-significant, and a logistic regression model has shown that the women’s background characteristics do not explain the decision to choose a less effective or a more effective method (results not presented).

Figure 5. Percent distribution of switchers during the first year of contraceptive initiation, by relative effectiveness of the destination method, 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

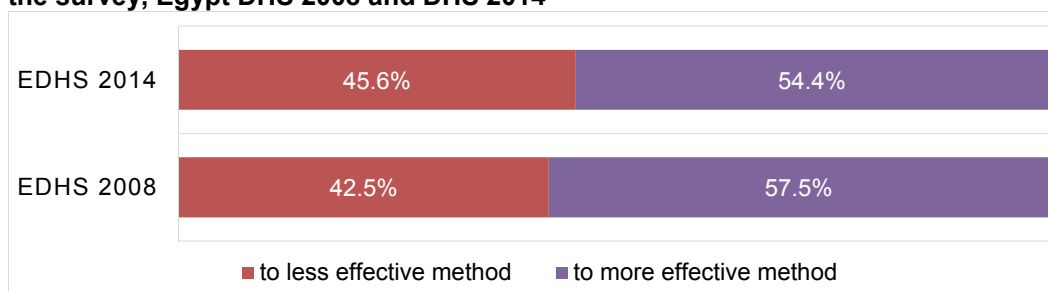


Table 7 shows that the same pattern described above applies to women in all background characteristics, with one exception. The pattern was slightly different for women in the highest wealth group where there was almost no change between the two surveys regarding the status of users after discontinuation.

² Effectiveness is the extent by which a contraceptive method lowers the chances to become pregnant in a given month. This measure depends both on the ability of women to conceive and on the method’s failure rate.

Table 7. Status-specific 12 months discontinuation rates by background characteristics 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

Background characteristics	No longer in need			Switching in the following month			Method failure			Abandoned use while in need			Discontinuation rate	
	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)	2008	2014
Age														
15-24	9.1	14.3	5.1***	8.7	8.9	0.2***	3.3	4.9	1.5***	9.2	6.9	-2.2***	30.3	35.0
25-34	7.3	9.8	2.5***	7.1	7.3	0.2***	3.0	4.4	1.4***	6.2	6.5	0.3***	23.6	27.9
35-49	7.9	11.9	4.0***	7.5	6.6	-0.9***	1.5	2.3	0.8***	5.8	5.3	-0.5***	22.7	26.1
Number of living children														
One	13.1	18.0	4.9***	9.0	8.5	-0.5***	4.3	7.5	3.2***	10.6	8.6	-2.0***	36.9	42.6
Two	5.9	11.0	5.1***	7.8	7.8	0.1***	3.1	3.7	0.6***	5.9	5.4	-0.5***	22.6	28.0
Three	5.8	8.0	2.2***	6.5	8.0	1.5***	1.9	2.6	0.8***	6.0	5.5	-0.4***	20.1	24.2
Four or more	6.7	8.6	1.9***	7.5	6.6	-1.0***	1.8	2.9	1.1***	6.1	6.2	0.1***	22.1	24.2
Urban-rural residence														
Urban	6.6	8.7	2.1***	7.6	7.2	-0.5***	3.1	4.1	1.0***	6.9	5.0	-1.9***	24.3	25.0
Rural	9.1	13.2	4.1***	7.9	8.1	0.2***	2.7	4.3	1.6***	7.6	7.2	-0.4***	27.2	32.8
Place of residence														
Urban Governorates	6.2	8.0	1.8***	6.9	7.0	0.1***	3.2	4.6	1.3***	6.4	5.3	-1.2***	22.8	24.9
Lower Egypt	8.3	10.8	2.6***	6.6	8.0	1.4***	2.8	4.3	1.6***	5.6	5.3	-0.4***	23.3	28.5
Urban	7.2	8.0	0.8***	5.2	7.1	1.9***	3.1	3.8	0.7***	5.7	4.6	-1.1***	21.2	23.5
Rural	8.6	11.5	2.9***	7.1	8.3	1.2***	2.7	4.5	1.8***	5.6	5.5	-0.2***	23.9	29.7
Upper Egypt	8.9	14.3	5.5***	9.5	7.6	-1.9***	2.8	4.1	1.3***	9.7	8.6	-1.2***	30.9	34.6
Urban	6.9	10.2	3.3***	10.7	7.2	-3.5***	2.9	4.0	1.2***	8.7	5.2	-3.5***	29.2	26.6
Rural	9.7	15.9	6.2***	8.9	7.7	-1.2***	2.8	4.2	1.4***	10.2	9.9	-0.3***	31.6	37.7
Level of education														
No education	7.6	10.3	2.7***	6.5	6.2	-0.3***	2.8	3.7	0.9***	7.8	8.2	0.3***	24.7	28.3
Less than primary	7.9	11.8	3.9***	9.2	8.8	-0.4***	3.5	5.7	2.2***	8.0	6.8	-1.2***	28.5	33.1
Primary complete, some secondary	8.0	12.8	4.8***	7.8	7.6	-0.1***	2.5	4.2	1.6***	8.4	7.0	-1.4***	26.7	31.6
Secondary/higher	8.5	12.0	3.5***	8.16	8.2	0.04***	2.9	4.4	1.4***	6.6	5.8	-0.8***	26.1	30.3
Wealth index quintiles														
Lowest	6.8	12.0	5.1***	7.6	7.2	-0.4***	2.9	5.4	2.5***	9.5	8.9	-0.6***	26.9	33.6
Low	9.0	14.5	5.5***	7.2	7.7	0.5***	3.2	4.0	0.8***	7.8	7.3	-0.5***	27.3	33.6
Middle	8.3	13.3	5.0***	8.7	8.6	-0.1***	2.7	3.4	0.7***	6.8	6.7	-0.1***	26.5	32.0
High	7.6	9.7	2.2***	7.9	8.1	0.2***	2.6	4.8	2.3***	7.1	5.0	-2.1***	25.1	27.6
Highest	8.9	8.7	-0.2***	7.2	6.8	-0.4***	2.9	4.0	1.1***	5.5	4.6	-0.9***	24.6	24.2
Total	8.1	11.8	3.7***	7.76	7.77	0.01***	2.9	4.3	1.4***	7.3	6.5	-0.8***	26.1	30.3

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

4. Discussion

Within the context of the recent rise in fertility in Egypt, this paper has documented the accompanying rise in the discontinuation rates for all contraceptives and among subgroups of the population. “High rates of discontinuation stress the need to improve service quality, particularly counseling, so that women can make an informed choice and are forewarned about side-effects and reassured about health concerns. Timely and informed method-switching needs to be better recognized by the program in order to avoid unintended pregnancies, abortion and unwanted or mistimed births” (Ali, Cleland and Shah 2012). In the current paper we distinguish between two broad categories of reasons for discontinuation: “method/service-related” (supply) and “reduced need for contraception” (demand). Both affect user attitudes and behavior and are equally responsible, in our view, for changes in the dynamics of contraceptive use. This approach will also emphasize the importance of advocacy and raising awareness among women and family planning service providers. Anecdotal evidence indicates that some doctors have personal beliefs that may affect carrying out or recommending particular procedures for family planning clients. As members of the society, family planning service providers have been affected by the recent cultural and social change in the country, especially religious attitudes.

The ranking of women’s cited reasons for discontinuation has significantly changed between surveys in 2008 and 2014. While “side effects/health concerns” remains the most common reason in both surveys for all three methods studied, the second-most cited reason for discontinuation changed from “other method/service-related reasons” in the 2008 survey to “desire to get pregnant” in the 2014 survey.

In general, the grouped reason-specific discontinuation rate concerned with the contraceptive method itself and with family planning service provision (supply) has remained almost constant at 18%, while the grouped reason-specific discontinuation rate related to less need for contraception (demand) has significantly increased, from 8% in 2008 to 12% in 2014. This pattern took place among users of hormonal methods, while among IUD users both grouped reason-specific discontinuation rates have increased significantly.

The recent increase in the ideal family size in Egypt has been documented (Ministry of Health and Population, El Zanaty and Associates and ICF International 2015b), at 3.4 children among men and 3.1 among women of reproductive age, and could be a motive to get pregnant and stop using a family planning method. The report shows the highest ideal number of children to be among women who have two children, women living in rural areas, especially in rural Upper Egypt, and women in the middle wealth index quintile. We may conclude that the observed shift toward discontinuation for reasons of “reduced need” among contraceptive users is largely influenced by women’s attitudes, desires, and background characteristics rather than service delivery factors.

It is possible that these results for all methods could conceal differences by individual methods. In this paper, our focus was on each of the three main contraceptive methods that together form over nine-tenths of the total method mix in both surveys—IUD, pills, and injectables. This focus helps in understanding discontinuation, switching, and exposure to unintended pregnancies.

The IUD is the most popular contraceptive method, at about half of the method mix (Ministry of Health and Population, El Zanaty and Associates, and ICF International 2015a). Although it is a long-term contraceptive method, it can be used for spacing because it is reversible, and this is common in Egypt. A comparative study about the discontinuation of IUD use (Ali, Mohamed, et al. 2011), which included data from the EDHS 2008, reported that in all countries studied, women were more likely to use modern methods other than IUDs to space births—with the exception of Egypt.

Compared with the pill, IUD users are less likely to discontinue use within the first year of use, but discontinuation rates are high during the second and third years after initiation. IUD users experience a lower failure rate and are more likely to switch to another method compared with pill discontinuers. In our study, these rates increased slightly between 2008 and 2014 among all categories of women except women in urban areas, especially in urban Upper Egypt.

Among discontinuers of the IUD the reason-specific 12 months discontinuation rate for “reduced need” increased from 3% in 2008 to 4% in 2014, compared with a drop from 0.7% to 0.3% for “other method/service-related reasons.” This pattern may reflect the aspiration of women—and their husbands—to achieve a higher ideal number of children. This pattern was more prominent for women in the lowest wealth index quintile.

Researchers have pointed out the possibility that discontinuation of the IUD is especially significant in relation to the decision regarding desired family size. A policy brief by the World Health Organization concluded, “IUD users are distinguished by the relatively long duration of their IUD use and low failure rates. The reason is uncertain but the fact that discontinuation of this method typically requires a deliberate decision and a visit to a healthcare provider for removal is probably part of the explanation. In contrast, discontinuation of pills, injectables, and condoms is a passive act” (WHO 2012).

Concerning the switching behavior of the IUD users, the comparative study mentioned above studied switching behavior of IUD users within 3 months of removal (Ali et al. 2011) and reported, “Switching back to an IUD (possibly a different type) was very rare except in Egypt and Kazakhstan.” In the current study we calculated switching within 1 month of IUD removal and found that, in 2008, 26% of the IUD discontinuers were using injectables, 66% the pill, and 8% condoms or traditional methods. In 2014, after one month of removal, only 13% were using injectables, while use of the pill had risen to 75%, and 11% used condoms or traditional methods.

Women’s concerns about side effects and other health issues may be increasing, but it also appears that the decision to discontinue IUD use in order to get pregnant is increasing.

The drop in the percentage of IUD discontinuers who believe they are not exposed to the risk of pregnancy may be due to the fact that IUD use is more popular among older women. The switching behavior of the IUD users can be described as “positive,” which leaves the woman in a state of reduced risk of pregnancy. Together with the results showing a significant drop in discontinuation rate for IUD users for the reason “abandoned use while in need,” we may conclude that the expected effect of IUD discontinuation on fertility is not large.

Pill users have the highest discontinuation rates and the highest contraceptive failure rate of the three contraceptive methods studied in this report. The 12 months discontinuation rates have increased among pill users, especially among women who have two children, women in rural areas, especially in rural Upper Egypt, and women in the middle wealth index quintile. Pills form about a quarter of Egypt’s contraceptive method mix (Ministry of Health and Population, El Zanaty, and Associates, and ICF International 2015a), and thus the rise in discontinuation rates for pill use will have an impact on fertility rates in the future by increasing unintended pregnancies.

Reason-specific discontinuation rates for pills have changed significantly. The rate for “method/service-related” reasons dropped slightly, from 24.1% in 2008 to 23.5% in 2014, while the rate for “reduced need” increased from 16% to 18% (Appendix 3.b). This indicates that the increase found overall for the “reduced need” discontinuation rates and the decrease in the “method/service” discontinuation rates applies to the pill users, and especially women who live in rural Upper Egypt, women with less than primary education, and women in the low wealth index quintile.

Although the discontinuation rate of pill users who switch to another method within one month of stopping the pill has dropped, from 10% in 2008 to 8% in 2014, the large majority of pill users who reported switching to another method have switched to a more effective method. In the 2008 survey 85% switched to the IUD and injectables, and 89% in the 2014 survey (Appendix 4).

Injectables are a relatively recent addition to the method mix in Egypt, but injectable use has risen to 15% of total contraceptive use in the 2014 EDHS. Between the 2008 and 2014 surveys, the discontinuation rate of injectables has decreased among women in the urban governorates and in Lower Egypt, both in urban and rural areas, and among women in the high and highest wealth index quintiles, while it has increased in Upper Egypt in rural Upper Egypt and among the lowest wealth index quintiles. The changes in reasons for discontinuing injectable use are similar to those for the pill, with a much lower failure rate, and injectable users are more likely to abandon use while in need. Among those who switch from injectables to another method, about two-thirds switch to the pill, while the proportion switching to the IUD declined from 28% in 2008 to 17% in 2014.

Appendix 5 presents a summary of the discontinuation rates, reasons for discontinuation, and the contraceptive status of women after discontinuation by the three most significant background characteristics (place of residence, wealth index, and number of children). Differentials by the mean ideal number of children are also included. This summary can guide the reader through the next section on policy implications.

5. Policy Implications

The need for controlling fertility for Egypt's development has long been established (Khalifa, DaVanzo, and Adamson 2000). Fertility levels declined between 1980 and 2008 but the TFR rose substantially during the 6-year period between 2008 and 2014 DHS surveys, from a level of 3.0 births per woman to 3.5 births per woman (Ministry of Health and Population, El Zanaty and Associates, and ICF 2015a). Contraceptive prevalence rose rapidly in the 1980s, and continued to rise, reaching 60% in the 2003 EDHS, but has not changed significantly since then. The mean ideal number of children among men is about 10% higher than women's ideal number (at 3.4 children and 3.1 children respectively) (Ministry of Health and Population, El-Zanaty and Associates, and ICF International 2015b).

The results of this research may imply that while Egypt's family planning program has continued to pursue an increase in contraceptive prevalence, strategies aiming to ensure better use compliance and longer durations of use have not been as effective. A general indicator of how well the family planning program is achieving its goals is the program effort score. This score declined from 66% in 1989 to 59% in 1994 and 57% in 1999 (Ross et al. 2001). There were great variations across regions and governorates (Khalifa et al. 1999), with a low score on services (58%) and on access (51%) (Ross et al. 2010).

An analysis among countries that had once received technical and financial support from USAID presented conditions to ensure these "graduated" countries would continue their progress (Ross and Smith 2011). They cited "the balance among competing justifications that drive the programs" as a major consideration for directing national effort. It is important to note that the rise in the ideal family size is a strong indicator that may contribute to making the strategic target of avoiding unwanted births a low priority consideration on the agenda of the Egypt family planning program in the future.

The results of this research highlight the fact that program-related factors such as cost or access remain reasons for discontinuing use of contraception. However, the main program-related reasons are users' desire for a more effective method and side effects and health concerns. This result suggests that better counseling in these areas might have the potential to decrease failure rates and improve switching behavior, as it indicates that women are not well informed about contraceptive method effectiveness and possible side effects or about alternative methods that women might prefer. If these issues are not given due attention, many women may be at greater risk for having an unintended pregnancy because they may abandon a method without immediately adopting another. The dissemination of the study results among policymakers will highlight the potential impact of strategies that address better use compliance and longer duration of contraceptive use in Egypt and its relation to achieving the goal of fertility reduction, taking into account regional considerations.

A special issue in this regard is the high discontinuation rates of the two hormonal methods due to side effects and/or health concerns. The fact that switching between these two methods is common requires that switchers should be encouraged to move to the destination method as soon as possible so as to reduce the time of exposure to the risk of conception. It is an indication that women need forewarning about side effects and reassurance with regard to safety as well as advice that alternative methods are available if the initial method is found to be unsatisfactory. This is to ensure timely switching if needed.

Contraceptive security remains a financial challenge for Egypt. It is clear that plans to avoid unintended pregnancies among contraceptive current users are likely to require an increased allocation of resources. However, the financial and health burden of unintended pregnancies may make program efforts to avoid unintended pregnancies quite cost effective. This argument can be verified by cost-effectiveness studies to be based on the estimates produced by this research regarding the number of births that can be averted by reducing discontinuation and switching.

On the other hand, the research has shown that the recent increase in the mean ideal family size is starting to affect the impact of the family planning program on fertility. In order for this result to influence the national family planning strategy, further research is needed to quantify the effect of discontinuation on fertility. From a women's needs/rights perspective, research is needed to address the impact of discontinuation on unmet need and especially regarding the feasibility of reaching the goals of FP2020. Qualitative research may be useful in understanding the process by which women formulate their fertility intentions, the reasons for wanting more children, the reasons driving women's perception that they are no longer exposed to pregnancy, and reasons behind the increase in the failure rates.

Appendices

Appendix 1. Number of segments of use, 5 years before the survey by contraceptive method and women's background characteristics, Egypt DHS 2008 and DHS 2014

Background characteristics	DHS 2008				DHS 2014			
	Inject-able	IUD	Pills	All methods	Inject-able	IUD	Pills	All methods
Age								
15-24	497	2027	1140	4132	553	2178	2290	5529
25-34	759	2149	1233	4784	1049	2739	2957	7611
35-49	353	657	507	1786	411	588	788	2092
Number of living children								
None	2	13	14	35	7	14	31	58
One	211	1499	884	2943	218	1555	1798	3845
Two	410	1403	811	2947	728	1790	1853	4656
Three	386	1096	546	2324	780	1288	1247	3597
Four or more	602	822	625	2455	792	858	1110	3080
Urban-rural residence								
Urban	453	2080	1088	4171	588	1925	1897	4807
Rural	1156	2754	1792	6533	1936	3580	4141	10430
Place of residence								
Urban Governorates	175	962	388	1755	180	737	586	1633
Lower Egypt	679	2470	1281	4857	1172	3149	3049	7910
Urban	118	580	327	1119	163	608	626	1535
Rural	562	1890	954	3738	1009	2541	2423	6375
Upper Egypt	737	1348	1168	3956	1155	1578	2342	5561
Urban	150	501	344	1207	239	556	647	1560
Rural	587	847	824	2750	916	1022	1695	4002
Frontier Governorates	18	53	42	137	17	41	61	131
Level of education								
No education	644	954	672	2684	842	752	907	2723
Less than primary	202	344	190	866	161	239	317	777
Primary complete, Some secondary	272	720	456	1663	483	940	977	2580
Secondary/higher	492	2816	1562	5490	1039	3575	3837	9156
Wealth index quintiles								
Lowest	481	664	459	1940	691	673	923	2526
Low	394	835	567	2074	642	954	1195	3006
Middle	375	1019	654	2316	604	1458	1588	3871
High	239	1148	633	2247	402	1251	1293	3212
Highest	120	1168	568	2128	185	1168	1039	2620
Total	1609	4833	2880	10704	2524	5505	6038	15236

Appendix 2. Twelve months life table discontinuation rates by background characteristics for IUD, pills, and injectables segments during 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

Background characteristics	IUD			Pills			Injectables		
	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)
Age									
15-24	15.9	18.8	2.9***	44.1	46.1	1.9***	46.9	44.6	-2.3***
25-34	10.5	12.2	1.7***	35.0	39.6	4.6***	32.8	34.2	1.4***
35-49	4.8	7.2	2.5***	41.9	37.2	-4.7***	31.9	37.9	6.0***
Number of living children									
One	22.0	26.2	4.2***	51.5	52.9	1.4***	63.7	63.3	-0.4***
Two	8.6	10.9	2.4***	31.6	39.4	7.8***	42.0	39.6	-2.4***
Three	6.4	7.3	0.9***	36.8	35.3	-1.5***	30.4	35.5	5.0***
Four or more	6.6	9.3	2.7***	36.1	33.0	-3.0***	28.0	31.0	2.9***
Urban-rural residence									
Urban	11.0	11.6	0.6***	36.6	34.4	-2.2***	38.7	38.4	-0.3***
Rural	12.7	15.8	3.1***	41.9	45.2	3.3***	36.6	37.8	1.2***
Place of residence									
Urban Governorates	11.9	12.9	1.0***	34.3	35.1	0.8***	36.2	36.0	-0.2***
Lower Egypt	9.8	13.1	3.2***	40.1	42.2	2.1***	36.8	34.5	-2.3***
Urban	7.5	10.3	2.7***	37.8	35.0	-2.8***	36.3	33.3	-3.0***
Rural	10.5	13.7	3.2***	40.9	44.1	3.2***	36.9	34.7	-2.2***
Upper Egypt	15.9	17.6	1.7***	41.7	43.2	1.5***	38.0	41.7	3.8***
Urban	13.4	11.3	-2.1***	38.0	33.2	-4.8***	44.5	43.5	-1.0***
Rural	17.3	20.9	3.6***	43.2	47.0	3.7***	36.3	41.3	5.0***
Frontier Governorates	15.0	12.2	-2.7***	35.4	33.1	-2.3***	28.7	30.3	1.6***
Level of education									
No education	11.5	14.2	2.8***	38.3	38.0	-0.3***	29.3	32.6	3.3***
Less than primary	11.6	10.8	-0.8***	45.6	47.8	2.2***	38.9	38.1	-0.8***
Primary complete, some secondary	14.5	16.4	2.0***	38.7	42.8	4.0***	33.4	38.5	5.1***
Secondary/higher	11.6	14.0	2.5***	40.2	41.9	1.7***	48.8	41.9	-6.8***
Wealth index quintiles									
Lowest	13.9	16.5	2.6***	41.2	45.1	4.0***	30.3	37.6	7.3***
Low	12.8	17.2	4.4***	40.7	44.6	4.0***	34.8	37.6	2.7***
Middle	13.3	14.8	1.6***	37.7	45.5	7.7***	37.9	38.0	0.1***
High	11.0	13.5	2.5***	37.7	38.0	0.3***	46.4	36.9	-9.5***
Highest	10.1	10.9	0.8***	42.8	34.6	-8.2***	52.1	41.9	-10.2***
Total	12.0	14.3	2.3***	39.9	41.8	1.9***	37.2	37.9	0.7***

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

Appendix 3.a. IUD discontinuation rates by reason for discontinuation and background characteristics five years preceding the survey, Egypt DHS 2008 and DHS 2014

Background characteristics	a. IUD						Total discontinuation rates	
	Reduced need			Method/Service related			2008	2014
	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)		
Age								
15-24	5.5	7.3	1.9***	10.4	11.4	1.1***	15.9	18.8
25-34	3.9	4.1	0.2***	6.5	8.1	1.6***	10.5	12.2
35-49	1.4	3.2	1.8***	3.4	4.0	0.7***	4.8	7.2
Number of living children								
One	9.2	11.7	2.5***	12.8	14.5	1.7***	22.0	26.2
Two	2.4	3.7	1.2***	6.1	7.3	1.1***	8.6	10.9
Three	2.0	1.0	-1.0***	4.4	6.3	1.9***	6.4	7.3
Four or more	1.2	2.7	1.5***	5.4	6.6	1.2***	6.6	9.3
Urban-rural residence								
Urban	4.1	4.1	-0.1***	6.9	7.5	0.7***	11.0	11.6
Rural	4.3	6.0	1.6***	8.4	9.8	1.4***	12.7	15.8
Place of residence								
Urban Governorates	5.0	5.3	0.4***	7.0	7.6	0.7***	11.9	12.9
Lower Egypt	3.8	4.9	1.1***	6.0	8.2	2.2***	9.8	13.1
Urban	2.4	3.1	0.7***	5.1	7.2	2.1***	7.5	10.3
Rural	4.2	5.3	1.1***	6.3	8.4	2.1***	10.5	13.7
Upper Egypt	4.5	6.2	1.7***	11.39	11.38	-0.01***	15.9	17.6
Urban	4.6	3.6	-1.0***	8.8	7.7	-1.1***	13.4	11.3
Rural	4.5	7.6	3.2***	12.9	13.3	0.4***	17.3	20.9
Level of education								
No education	4.1	5.3	1.2***	7.4	8.9	1.6***	11.5	14.2
Less than primary	2.8	2.3	-0.5***	8.9	8.5	-0.4***	11.6	10.8
Primary complete, some secondary	5.5	6.1	0.5***	8.9	10.4	1.5***	14.5	16.4
Secondary/higher	4.1	5.3	1.2***	7.4	8.7	1.3***	11.6	14.0
Wealth index quintiles								
Lowest	3.3	7.3	4.0***	10.6	9.2	-1.5***	13.9	16.5
Low	5.0	5.2	0.2***	7.8	12.0	4.2***	12.8	17.2
Middle	4.4	6.0	1.6***	8.9	8.8	-0.1***	13.3	14.8
High	3.9	4.7	0.9***	7.2	8.8	1.7***	11.0	13.5
Highest	4.5	4.0	-0.5***	5.6	6.9	1.3***	10.1	10.9
Total	4.2	5.3	1.1***	7.7	9.0	1.3***	12.0	14.3

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

Appendix 3.b. Pills discontinuation rates by reason for discontinuation and background characteristics 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

Background characteristics	b. Pills						Total Discontinuation Rates	
	Reduced Need			Method/Service related			2008	2014
	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)		
Age								
15-24	15.8	20.6	4.7***	28.3	25.5	-2.8***	44.1	46.1
25-34	14.9	16.2	1.3***	20.1	23.3	3.2***	35.0	39.6
35-49	17.7	19.2	1.6***	24.2	18.0	-6.3***	41.9	37.2
Number of living children								
One	20.7	23.0	2.3***	30.8	29.9	-0.9***	51.5	52.9
Two	11.9	18.0	6.1***	19.7	21.4	1.7***	31.6	39.4
Three	13.4	14.8	1.5***	23.4	20.5	-2.9***	36.8	35.3
Four or more	15.3	13.6	-1.7***	20.8	19.4	-1.3***	36.1	33.0
Urban-rural residence								
Urban	12.9	12.7	-0.1***	23.7	21.7	-2.0***	36.6	34.4
Rural	17.6	20.9	3.3***	24.3	24.3	0.0	41.9	45.2
Place of residence								
Urban Governorates	12.9	11.3	-1.6***	21.4	23.9	2.5***	34.3	35.1
Lower Egypt	17.0	18.0	1.1***	23.1	24.1	1.1***	40.1	42.2
Urban	16.4	12.8	-3.6***	21.4	22.2	0.8***	37.8	35.0
Rural	17.2	19.4	2.2***	23.7	24.7	1.0***	40.9	44.1
Upper Egypt	15.8	20.6	4.8***	25.9	22.5	-3.4***	41.7	43.2
Urban	10.2	14.1	3.9***	27.8	19.1	-8.7***	38.0	33.2
Rural	18.1	23.1	5.0***	25.1	23.9	-1.2***	43.2	47.0
Level of education								
No education	15.9	14.9	-1.0***	22.4	23.2	0.7***	38.3	38.0
Less than primary	15.0	22.4	7.3***	30.5	25.4	-5.1***	45.6	47.8
Primary complete, some secondary	14.3	17.6	3.4***	24.5	25.1	0.7***	38.7	42.8
Secondary/higher	16.4	19.0	2.6***	23.8	22.9	-0.9***	40.2	41.9
Wealth index quintiles								
Lowest	13.1	16.5	3.4***	28.1	28.7	0.6***	41.2	45.1
Low	15.8	23.0	7.2***	24.9	21.7	-3.2***	40.7	44.6
Middle	14.8	21.5	6.7***	23.0	24.0	1.0***	37.7	45.5
High	14.7	15.0	0.3***	22.95	22.99	0.04***	37.7	38.0
Highest	20.6	13.8	-6.8***	22.2	20.8	-1.4***	42.8	34.6
Total	15.8	18.3	2.5***	24.1	23.5	-0.6***	39.9	41.8

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

Appendix 3.c. Injectables discontinuation rates by reason for discontinuation and background characteristics 5 years preceding the survey, Egypt DHS 2008 and DHS 2014

Background characteristics	c. Injectables						Total discontinuation rates	
	Reduced need			Method/Service related			2008	2014
	2008	2014	Δ (2014-2008)	2008	2014	Δ (2014-2008)	2008	2014
Age								
15-24	14.7	17.0	2.3***	32.2	27.6	-4.6***	46.9	44.6
25-34	9.0	10.8	1.8***	23.9	23.4	-0.5***	32.8	34.2
35-49	10.2	14.9	4.7***	21.7	22.9	1.2***	31.9	37.9
Number of living children								
One	23.7	26.2	2.5***	40.0	37.0	-2.9***	63.7	63.3
Two	8.8	14.0	5.2***	33.2	25.6	-7.6***	42.0	39.6
Three	8.7	11.0	2.3***	21.7	24.4	2.8***	30.4	35.5
Four or more	9.2	11.4	2.1***	18.8	19.6	0.8***	28.0	31.0
Urban-rural residence								
Urban	8.3	12.8	4.4***	30.3	25.6	-4.7***	38.7	38.4
Rural	12.1	13.6	1.5***	24.5	24.2	-0.3***	36.6	37.8
Place of residence								
Urban Governorates	4.3	9.4	5.1***	31.9	26.6	-5.3***	36.2	36.0
Lower Egypt	12.0	11.0	-1.0***	24.8	23.6	-1.3***	36.8	34.5
Urban	9.1	11.3	2.2***	27.2	22.1	-5.1***	36.3	33.3
Rural	12.6	10.9	-1.7***	24.3	23.8	-0.5***	36.9	34.7
Upper Egypt	12.0	16.6	4.7***	26.0	25.1	-0.9***	38.0	41.7
Urban	12.9	16.4	3.5***	31.7	27.1	-4.6***	44.5	43.5
Rural	11.7	16.7	5.0***	24.6	24.6	0.1***	36.3	41.3
Level of education								
No education	8.6	11.9	3.2***	20.7	20.7	0.1***	29.3	32.6
Less than primary	13.8	9.3	-4.5***	25.1	28.8	3.7***	38.9	38.1
Primary complete, some secondary	8.5	17.6	9.0***	24.9	20.9	-4.0***	33.4	38.5
Secondary/higher	14.5	13.4	-1.0***	34.3	28.5	-5.8***	48.8	41.9
Wealth index quintiles								
Lowest	9.7	13.8	4.1***	20.6	23.8	3.2***	30.3	37.6
Low	13.0	15.1	2.1***	21.8	22.4	0.6***	34.8	37.6
Middle	10.7	12.8	2.0***	27.1	25.2	-1.9***	37.9	38.0
High	10.6	12.5	1.9***	35.8	24.4	-11.4***	46.4	36.9
Highest	12.6	10.2	-2.4***	39.5	31.8	-7.7***	52.1	41.9
Total	11.1	13.4	2.4***	26.1	24.5	-1.6***	37.2	37.9

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

Appendix 4.a. Switching methods during 12 months of discontinuation, Egypt DHS 2008

a. Switching methods during 12 months of discontinuation 2008						
Discontinued method	Destination method					Total
	Injectables	IUD	Pill	Condom	Traditional	
Injectables	0 0.0%	68 28.2%	156 64.9%	4 1.5%	13 5.4%	240 100.0%
IUD	70 26.8%	0 0.0%	174 66.6%	8 3.2%	9 3.4%	262 100.0%
Pill	82 26.4%	193 62.2%	0 0.0%	9 2.8%	27 8.6%	310 100.0%
Condom	2 6.1%	14 58.2%	3 13.0%	0 0.0%	6 22.7%	25 100.0%
Traditional	74 25.2%	112 38.1%	95 32.3%	5 1.7%	8 2.7%	294 100.0%
All	227 20.1%	387 34.2%	428 37.9%	26 2.3%	62 5.5%	1130 100.0%
		to a less effective method			481	42.5%
		to a more effective method			650	57.5%

Appendix 4.b. Switching methods during 12 months of discontinuation, Egypt DHS 2014

b. Switching methods during 12 months of discontinuation 2014						
Discontinued method	Destination method					Total
	Injectables	IUD	Pill	Condom	Traditional	
Injectables	0 0.0%	45 16.6%	171 63.4%	2 0.8%	52 19.3%	269 100.0%
IUD	48 13.4%	0 0.0%	269 75.3%	8 2.3%	32 9.0%	358 100.0%
Pill	124 21.6%	362 63.2%	0 0.0%	9 1.7%	77 13.5%	572 100.0%
Condom	3 21.5%	5 34.5%	6 36.7%	0 0.0%	1 7.3%	15 100.0%
Traditional	54 18.7%	90 31.2%	123 42.9%	4 1.3%	17 6.0%	287 100.0%
All	229 15.2%	501 33.4%	569 37.9%	24 1.6%	180 12.0%	1502 100.0%
		to a less effective method			684	45.6%
		to a more effective method			818	54.4%

Appendix 5. Summary of differentials in discontinuation rates, reason for discontinuation, status after discontinuation, status after discontinuation, and the mean ideal number of children, by place of residence, wealth index, and number of children, Egypt DHS 2014

Background characteristics	Reason for discontinuation ²										Status after discontinuation ³			Mean ideal number of children ⁴		
	12 months discontinuation rates ¹					Method/service-related					No longer in need	Switched	Method failure	Abandoned while in need	Women 15-49	Men 15-49
	IUD	Pills	Injectable	Reduced need	Method/service-related	Reduced need	Method/service-related	Method failure	Abandoned while in need							
Place of Residence																
Urban Governorates	12.9	35.1	36.0	8.0	16.8*	8.0	7.0	4.6	5.3	2.8	3.0					
Lower Urban	10.3	35.0	32.3	8.0	15.5	8.0	7.1	3.8	4.6	2.8	3.1					
Lower Rural	13.7	44.1	34.4	11.5	18.2	11.5	8.3	4.5	5.5	3.0	3.2					
Upper Urban	11.3	33.2	43.7	10.2	16.4	10.2	7.2	4.0	5.2	3.0	3.5					
Upper Rural	20.9	47.1	41.6	15.9	21.8	15.9	7.7	4.2	9.9	3.4	3.9					
Wealth index quintiles																
Lowest	16.5	45.1	37.6	12.0	21.6	12.0	7.2	5.4	8.9	3.3	3.7					
Low	17.2	44.6	37.6	14.5	19.1	14.5	7.7	4.0	7.3	3.2	3.5					
Middle	14.8	45.5	38.0	13.3	18.7	13.3	8.6	3.4	6.7	3.1	3.4					
High	13.5	38.0	36.9	9.7	17.9	9.7	8.1	4.8	5.0	2.9	3.3					
Highest	10.9	34.6	41.9	8.7	15.5	8.7	6.8	4.0	4.6	2.8	3.1					
Number of living children																
One	26.2	52.9	63.3	18.0	24.6	18.0	8.5	7.5	8.6	-	-					
Two	10.9	39.4	39.6	11.0	17.0	11.0	7.8	3.7	5.4	-	-					
Three	7.3	35.3	35.5	8.0	16.2	8.0	8.0	2.6	5.5	-	-					
Four or more	9.3	33.0	31.0	8.6	15.6	8.6	6.6	2.9	6.2	-	-					
Total	14.3	41.8	37.9	11.8	18.5	11.8	7.8	4.3	6.5	3.1	3.4					

¹ Appendix 2

² Table 5

³ Table 7

⁴ Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], and ICF International. 2015. Egypt Health Issues Survey 2015.

* Bold figures are "above average."

References

- Ali, M. M., J. Cleland and I. Shah. 2012. *Causes and Consequences of Contraceptive Discontinuation: Evidence from 60 Demographic and Health Surveys*. World Health Organization: Geneva, Switzerland.
- Ali, M. M., R. Sadler, J. Cleland, T. Ngo, and I. Shah. 2011. *Long-term Contraceptive Protection, Discontinuation and Switching Behavior: Intrauterine Device (IUD) Uses Dynamics in 14 Developing Countries*. London: World Health Organization and Marie Stopes International.
- Avenir Health. 2014. Spectrum Manual, Spectrum System of Policy Models: Resource Needs Model (RNM), in *Avenir Health*, ed. Spectrum Manual, Spectrum System of Policy Models: Glastonbury, CT.
<http://avenirhealth.org/Download/Spectrum/Manuals/SpectrumManualE.pdf>.
- Awadalla, H. 2013. "Contraceptive Discontinuation among Egyptian Women: Results from Egypt Demographic and Health Survey 2005." *AF Preventive Medicine Bulletin* 12(1):19-26.
- Bertrand, J. T., R. Magnani, and R. Naomi. "Evaluation Family Planning Programs: with Adaptations for Reproductive Health." The Evaluation Project, USAID Contract Number: DPE-3060-C-00-1054-00 September 1996.
- Blanc, A.K., L. Sian, and N. Trevor. 2002. "Monitoring Contraceptive Continuation: Links to Fertility Outcomes and Quality of Care." *Studies in Family Planning* 33(2):127-140.
- Bradley, S. E. K., M. Hilary, and K. Shan. 2009. *Levels, Trends, and Reasons for Contraceptive Discontinuation*. DHS Analytical Studies No. 20.
- Castle, S., and I. Askew. 2015. "Contraceptive Discontinuation: Reasons, Challenges, and Solutions." Population Council.
- Coviello, V., and M. Boggess. 2004. "Cumulative Incidence Estimation in the Presence of Competing Risks." *The Stata Journal*, 2:103–112.
- El-Zanaty, F., and A. Way. 2009. *Egypt Demographic and Health Survey 2008*. Cairo, Egypt: Ministry of Health, El-Zanaty and Associates, and Macro International.
- El-Tawila, S. 1995. "Contraceptive Use Dynamics in Egypt" In *Perspectives on Fertility and Family Planning in Egypt*, ed. M. Mahran et al. Calverton, Maryland: National Population Council (Arab Republic of Egypt), and Macro International Inc.
- Jain, A. 2014. The Leaking Bucket Phenomenon in Family Planning. Champions for Choice.
<http://champions4choice.org/2014/09/the-leaking-bucket-phenomenon-in-familyplanning/1429>
- Kalbfleisch, J. D., and R. Prentice. 2002. "The Statistical Analysis of Failure Time Data." 2nd ed. New York: Wiley.
- Khalifa, M., E. Suliman, and J. Ross. 1999. "Family Planning Program Effort in Egypt's Governorates." Futures Group International, POLICY Project. [17] p. (USAID Contract No. CCP-C-00-95-00023-04).

- Khalifa, M., J. DaVanzo, and D. Adamson. 2000. "Population Growth in Egypt: A Continuing Policy Challenge." IP-183. RAND Issue Papers.
- Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], and ICF International. 2015a. *Egypt Demographic and Health Survey 2014*. Cairo, Egypt and Rockville, Maryland, USA.
- Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], and ICF International. 2015b. *Egypt Health Issues Survey 2015*. Cairo, Egypt and Rockville, Maryland, USA.
- National Population Council. 2015. "National Strategic Population Plan 2015-2030." Cairo, Egypt.
- Ross, J., and E. Smith. 2011. "Trends in National Family Planning Programs." *International Perspectives on Sexual and Reproductive Health* 37(3):125-33.
- Ross, J., and E. Smith. 2010. The Family Planning Effort Index: 1999, 2004, and 2009. Washington, DC: Futures Group, Health Policy Initiative, Task Order 1.
- Ross, J., and J. Stover. 2001. "The Family Planning Program Effort Index: 1999 Cycle." *International Family Planning Perspectives* 27(3):119-129.
- Rutstein, O., and G. Rojas. 2006. Guide to DHS Statistics. *Demographic and Health Surveys*. ORC Macro: Calverton, Maryland.
- Sayed, H. and W. Abdel Aziz. 2011. "Trends of Contraceptive Discontinuation and Switching in Egypt during 2000-2008." (paper presented at the Annual Conference of Statistics Department, Faculty of Economics and Political Sciences, Cairo University: Egypt).
- Stover, J., and E. Sonneveldt. 2017 "Progress toward the Goals of FP2020." *Studies in Family Planning* 48(1), March 2017.
- United Nations Development Program (UNDP) and the Ministry of National Planning. 2015. "Egypt's Progress towards Millennium Development Goals (MDGs). Background paper produced for the 2015 National Human Development Report. Cairo, Egypt.
- Way, A. 2003. "Contraceptive Use Dynamics in Egypt: An In-depth Analysis." In: *Perspectives on Women's and Children's Health in Egypt, Results of Further Analysis of the 2000 Egypt Demographic and Health Survey*. DHS Further Analysis Reports No. 42. Calverton, Maryland, USA. El-Zanaty and Associates [Egypt] and ORC Macro, Apr. 43-56
- World Health Organization (WHO). 2012. Contraception Discontinuation and Switching in Developing Countries. Research Policy Brief, June 2012 WHO/RHR/12.1.