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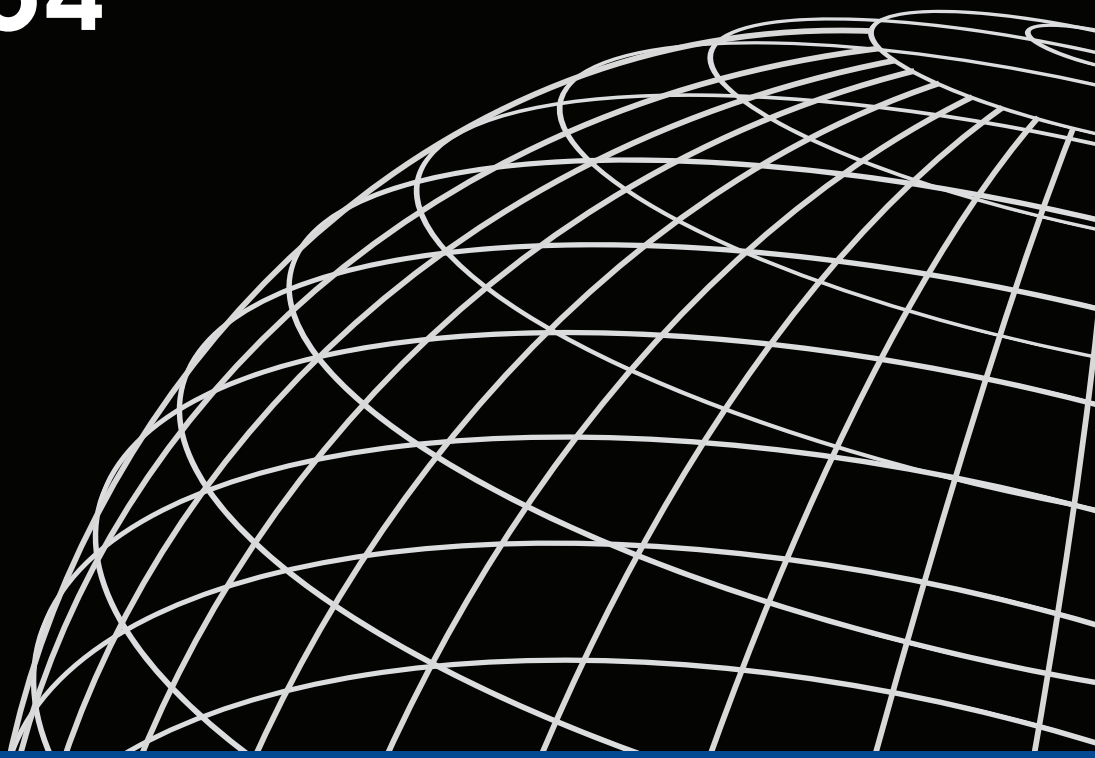

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Uptake and Discontinuation of Long-Acting Reversible Contraceptives (LARCs) in Low-Income Countries

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Contents

Tables v

Figures v

Preface vii

Abbreviations ix

Abstract xi

Executive Summary xiii

1. Background 1
    1.1 Long-acting and Permanent Contraceptive Methods 2
    1.2 Discontinuation 4
    1.3 Programmatic Environment 5

2. Data and Methods 7
    2.1 Data 8
    2.2 Methods 11

3. Starting and Using LARCs 13
    3.1 Current use of LARCs 13
    3.2 Adoption of LARCs 15

4. Stopping LARCs 23
    4.1 Discontinuation Rates 23
    4.2 Reasons for discontinuation 30
    4.3 Status after discontinuation 37

5. Policy and Programmatic Linkages 45

6. Discussion and Conclusions 55

References 59

Tables

Table 2.1. Total population size and DHS sample size of currently married women 15-49, by country ... 8
Table 3.1. Family planning method mix, by country ... 13
Table 3.2. Arrival at IUD use ... 17
Table 3.3. Arrival at implant use ... 18
Table 3.4. Arrival at injectable use ... 19
Table 3.5. Arrival at non-LARC modern method use ... 20
Table 3.6. Arrival at traditional/folkloric use ... 21
Table 4.1. Reasons for discontinuing IUDs ... 32
Table 4.2. Reasons for discontinuing implants ... 33
Table 4.3. Reasons for discontinuing injectables ... 34
Table 4.4. Reasons for discontinuing non-LARC modern methods ... 35
Table 4.5. Reasons for discontinuing traditional and folkloric methods ... 36
Table 4.6. Status 3 months after discontinuing IUDs ... 39
Table 4.7. Status 3 months after discontinuing implants ... 40
Table 4.8. Status 3 months after discontinuing injectables ... 41
Table 4.9. Status 3 months after discontinuing non-LARC modern methods ... 42
Table 4.10. Status 3 months after discontinuing traditional or folkloric methods ... 43
Table 5.1. Selected Family Planning Effort (FPE) scores, focal countries ... 46
Table 5.2. Pooled multilevel hazard model of discontinuing IUDs while still in need ... 49
Table 5.3. Pooled multilevel hazard model of discontinuing implants while still in need ... 51
Table 5.4. Pooled multilevel hazard model of discontinuing injectables while still in need ... 52
Appendix Table A1. List of FP2020 focus countries ... 57

Figures

Figure 2.1 Map of study countries ... 7
Figure 3.1. Share of LARCs in method mix ... 14
Figure 3.2. Composition of non-LARC modern methods excluding female sterilization ... 15
Figure 3.3. Arrival at method use: Pooled results ... 16
Figure 4.1. 12, 24 and 36-month failure and discontinuation rates by method type: Pooled results ... 24
Figure 4.2. 12, 24 and 36-month failure and discontinuation rates, IUDs ... 25
Figure 4.3. 12, 24 and 36-month failure and discontinuation rates, implants ... 26
Figure 4.4. 12, 24 and 36-month failure and discontinuation rates, injectables ... 27
Figure 4.5. 12, 24 and 36-month failure and discontinuation rates, non-LARC modern methods, excluding female sterilization ... 28
Figure 4.6. 12, 24 and 36-month failure and discontinuation rates, traditional and folkloric methods ... 29
Figure 4.7. Reasons for discontinuation: Pooled results ... 31
Figure 4.8. Status 3 months after method discontinuation: Pooled results ... 38

Figure 5.1. IUD share of method mix versus FPE IUD Access Score (2009), focal countries 47
Figure 5.2. Implant share of method mix versus FPE implant Access Score (2014), focal countries 47
Figure 5.3. Injectable share of method mix versus FPE Injectable Access Score (2009), focal countries 48

Preface

The Demographic and Health Surveys (DHS) Program is one of the principal sources of international data on fertility, family planning, maternal and child health, nutrition, mortality, environmental health, HIV/AIDS, malaria, and provision of health services.

One of the objectives of The DHS Program is to analyze DHS data and provide findings that will be useful to policymakers and program managers in low- and middle-income countries. DHS Analytical Studies serve this objective by providing in-depth research on a wide range of topics, typically including several countries and applying multivariate statistical tools and models. These reports are also intended to illustrate research methods and applications of DHS data that may build the capacity of other researchers.

The topics in the DHS Analytical Studies series are selected by The DHS Program in consultation with the U.S. Agency for International Development.

It is hoped that the DHS Analytical Studies will be useful to researchers, policymakers, and survey specialists, particularly those engaged in work in low- and middle-income countries.

Sunita Kishor
Director, The DHS Program

Abbreviations

DWSIN	Discontinuation (of family planning) while still in need
FPE	Family Planning Effort (Index)
IUD	Intrauterine device
LAM	Lactational Amenorrhea Method
LARC	Long-acting reversible contraceptive
PPA	Postpartum abstinence
RE	Random effects

Abstract

Long-acting reversible contraceptive (LARC) methods—intrauterine devices (IUDs), implants, and injectables—together comprise a growing share of contraceptive use in low-income countries. Using DHS contraceptive calendar data this paper examines married women's adoption and discontinuation of LARCs, other modern methods, and traditional/folkloric methods in 21 low-income countries. The two methods that require provider removal, IUDs and implants, have the lowest discontinuation rates. The discontinuation rate of injectables is on par with that of traditional methods and is lower than that of other non-LARC modern methods combined. Cost or access is infrequently cited as an issue in discontinuation of any method. Failure rates of LARC methods are low, but four in ten episodes of LARC discontinuation are attributed to side effects or health concerns, more than double that of other modern methods combined. Three months after discontinuing while still in need (DWSIN), 15 to 20 percent of LARC users are at risk of an unwanted pregnancy. We model the hazard of DWSIN based on individual and country-level characteristics. Adjusted hazard models find that starting an IUD or injectable after birth, postpartum abstinence, or LAM significantly reduces the hazard of DWSIN. Additionally, living in a country with greater access to the method being used and higher-quality family planning programs reduces the hazard of DWSIN. These findings point to the benefits that postpartum family planning efforts and a supportive programmatic environment confer on sustained LARC use.

Executive Summary

The proportion of women using a long-acting reversible contraceptive (LARC) method—IUD, implants, or injectables—has increased in low-income countries over the past few decades (Bertrand et al. 2014; Darroch 2013). Although LARCs are not medically indicated for all women or the appropriate choice for all couples, they offer an important form of protection for those who want to delay pregnancy for a longer time or limit births altogether but who are not committed to a permanent method.

This paper focuses on the contraceptive dynamics of LARC use among married women in low-income countries. It uses a life cycle approach to understand how women start these methods, how and why they stop, and what their status is three months after stopping. It also examines how individual and country characteristics affect the risk of discontinuation while still in need (DWSIN). High levels of DWSIN suggest method dissatisfaction and may leave women vulnerable to unwanted pregnancies if they do not start a new method.

Among FP2020's list of 69 focus countries, 21 countries with a DHS survey fielded during or after 2010 that included a contraceptive calendar with the reasons for discontinuation were selected for this study. With the exception of contraceptive method mix, the unit of the analysis in this study is a continuous episode of contraceptive use. Computations of discontinuation rates are based on multi-decrement life tables from episodes 3 to 62 months prior to the survey. Using multilevel hazard models, we analyze how individual and country characteristics affect the hazard of DWSIN.

Results show that the total share of LARCs in a method mix varies widely across countries and regions. Among users, LARC methods comprise the majority of the method mix among married women in more than half of these countries. By far, the largest overall proportions of any one LARC method are injectables; they comprise the largest share of any method in 8 of 21 countries studied. The share of IUD use is typically less than 10 percent in most countries but surpasses 50 percent in three countries: Egypt, Kyrgyz Republic, and Tajikistan. Implants comprise only 10 percent or less of all methods used in most countries.

Across focal countries, IUDs and traditional/folkloric methods were the methods most commonly started after birth, LAM/extended breastfeeding, or PPA. Meanwhile, the majority of episodes of injectable use were started after non-use. Previous LARC use more commonly preceded implants and non-LARC modern methods. The proportion whose modern method use was immediately preceded by a more effective (LARC) method was strikingly high in Indonesia (47 percent), and was also high in Rwanda (18 percent) and Egypt (15 percent).

On average, within the first year of use, 9 percent of women discontinue using implants, 15 percent discontinue IUDs, and 32 percent discontinue injectables. While these rates are less than the 40 percent of women who discontinue non-LARC modern methods in the first year, the 12 month discontinuation rate for injectables (32 percent) is on par with the 28 percent of women who discontinue traditional methods within the first year. Access and/or cost were not heavily cited as reasons for discontinuation among all countries for IUDs and implants but were more prominent among reasons for discontinuing injectables.

IUD discontinuation rates range from 20 percent at the end of three years in Indonesia to 76 percent in Sierra Leone. Method failure is higher than expected in Burundi, Zambia, and Pakistan, but was almost imperceptible in Cambodia, Indonesia, and Nepal. The share of discontinuations due to method failure is

lowest for IUD, implants, and injectables; higher for non-LARC modern methods; and highest for traditional/folk methods (at nearly 30 percent). In comparisons of reasons for discontinuation across the method types, desire for a more effective method is most common among traditional or folk method discontinuations, and lowest among IUD discontinuations. Side effects or health concerns were the reason given for four of ten episodes of LARC discontinuation.

Discontinuation while still in need is particularly problematic when it leaves women at risk of an unwanted pregnancy, which was true for 15 to 20 percent of the pooled sample of former LARC users in this study three months after discontinuation. Some level of method dissatisfaction and side effects are to be expected with any method, but high levels of DWSIN can indicate method dissatisfaction and service quality or gaps that put women at risk of an unintended pregnancy. This is somewhat counterbalanced by the low failure rates of LARC methods.

Comparing across the five FP method types, women are most likely to be at risk of an unwanted or too closely-spaced pregnancy three months after discontinuing injectables. Women who discontinued traditional methods are least likely to still be at risk, but this is largely because they are now pregnant.

We model the hazard of DWSIN for each of the three LARC method types using pooled multilevel Weibull survival models that incorporate country random effects. The results indicate that women are significantly more likely to continue a method if its adoption is immediately preceded by a birth, LAM, or PPA. Additionally, we use these models to quantify the dimension of experience related to supply, programs, and policies using scores from the Family Planning Effort (FPE) Index, which measures the strength of national FP programmatic efforts within low-income countries. The FPE scores used in this report indicate the quality of overall FP programs as well as access to the three LARC methods: IUDs, implants, and injectables. We find that LARC users in countries with greater access to their method and in countries with higher-quality FP programs have a significantly lower hazard of DWSIN.

The finding that among injectable and IUD users, women were significantly at less risk of discontinuation if they started the episode of use after birth, PPA, or LAM indicates the importance of postpartum FP efforts designed to help women space and limit births. The inverse relationship between quality of FP programs and the hazard of DWSIN suggests the importance that method choice, counseling, and safe clinical procedures have on sustained use. Access to the method is also inversely related to the hazard of DWSIN, but when access and quality scores are combined it appears that quality is the more important of the two. Collectively, these findings suggest that increasing service readiness and access to LARC methods is not enough to sustain use: national FP efforts should focus on offering a wide array of options for informed choice and high-quality provision of client-centered services. More research on the specific elements of programmatic quality that support continued use is needed to focus policy efforts.

1. Background

In recent decades, contraceptive prevalence has increased in low-income countries, become more diversified, and shifted toward a stronger reliance on modern methods (Bertrand et al. 2014; Seiber, Bertrand, and Sullivan 2007). As new methods are introduced, men and women have more options to choose a method that meets their preferences throughout the family planning (FP) life cycle, and contraceptive prevalence tends to increase (Ross and Stover 2013).

Despite increased use of FP, unmet need for contraception is still strikingly high, and is estimated at about 222 million women and approximately 1 in every 4 women in developing[1] countries in 2012 (Ross and Stover 2013; Singh and Darroch 2012). The World Health Organization (WHO) recommends waiting at least two years after delivery before attempting to conceive again (WHO 2005) because the risks for adverse health outcomes for both mothers and children are greatest when the interval between one birth and the next is either less than 27 months or greater than 60 months (Conde-Agudelo, Rosas-Bermúdez, and Kafury-Goeta 2006; Conde-Agudelo, Rosas-Bermúdez, and Kafury-Goeta 2007; Rutstein 2005; Rutstein 2008). Long-term contraceptive methods enable women and couples to cost-effectively avert pregnancy during these risky time periods by allowing women to space and/or limit births.

Long-acting reversible contraceptive methods (LARCs) typically include intrauterine devices (IUDs) and implants. There is no firm agreement on whether injectables are considered LARCs: they are not as long-acting as IUDs or implants, but they share the trait of not requiring user action after being taken. For this reason we include injectables in our definition of LARCs. In low-income countries, IUD use has been declining while injectable use has rapidly increased; as a group, LARCs represent a growing share of the method mix in most low-income countries (Darroch 2013; Bertrand et al. 2014).

Although LARCs are not medically indicated for all women or the appropriate choice for all couples, these three methods offer an important form of protection for couples to space and limit births for longer periods of time than most other modern methods. LARC methods may be a good option for couples who want to delay pregnancy for a longer time or limit any future pregnancies but who are not committed to a permanent method. Since most LARCs do not contain estrogen, they are generally compatible with breastfeeding.

This paper focuses on the contraceptive dynamics of LARC use in low-income countries. It uses a life cycle approach to understand how women start these methods, how and why they stop, and what their status is after stopping. It also examines how women's individual characteristics and the national context in which LARC uptake and discontinuation take place affect the risk of discontinuation while still in need (DWSIN). High levels of DWSIN suggest method dissatisfaction and may leave women vulnerable to unwanted pregnancies if they do not start a new method.

[1] The definition of 'developing countries' varies by international body and author. This report focuses on 'low-income countries' since they are the focus of FP2020 efforts and are more objectively defined. Low-income countries largely overlap with the group of countries considered 'developing'; as such, the literature on developing countries is considered broadly applicable to our study population.

1.1 Long-acting and Permanent Contraceptive Methods

IUDs

Intrauterine devices (IUDs) were first used in the beginning of the 20th century (Ali et al. 2011). They are T-shaped devices that must be inserted into a woman's uterus by a health care provider. The types of IUDs available differ by country. Three examples of popular, widely available brands of IUDs are Mirena, TCu 380A, and ParaGard. Mirena is hormonal (containing progestin) and lasts up to 5 years while TCu 380A and ParaGards' copper content prevents pregnancy for up to 12 years (Ali et al. 2011). At the end of this time, a provider must remove the IUD. The failure rate is below 1 percent in the first year of use (Hatcher, Trussell, and Nelson 2007). Evidence supports IUD insertion immediately after delivery (ideally within 10 minutes, but also up to 48 hours of placental delivery[2]) because of the convenience of a woman being present at a health facility and the guarantee that she is not currently pregnant. This practice is common in Egypt, China, and Mexico (Grimes et al. 2003; WHO 2015). Among all reversible modern methods, IUDs are the most cost-effective and the most effective at preventing pregnancy (Ali et al. 2011; Hatcher, Trussell, and Nelson 2007). After the IUD is removed, fecundity immediately returns; the 12-month post-removal pregnancy rate is comparable to non-IUD users (Mansour et al. 2011).

Worldwide, the use of IUDs has increased in the past few decades and, despite recent declines in prevalence, IUDs remain the most widely used reversible method (Ali et al. 2011; Seiber, Bertrand, and Sullivan 2007). China has the largest proportions of IUD users among all married women (33 percent) while the lowest use is in sub-Saharan Africa (0.8 percent); the IUD is the dominant method in seven low-income countries, five in Central Asian Republics, as well as Egypt and Vietnam (Ali et al. 2011). Several studies, however, are reporting a decrease or stagnation in the use of IUDs, particularly in sub-Saharan Africa and other low-income countries, although no significance testing was reported in these studies (Bertrand et al. 2014; Darroch and Singh 2013; Seiber, Bertrand, and Sullivan 2007).

Implants

Implants are also long-acting and extremely effective at preventing pregnancy, with a clinical failure rate less than 1 percent (Hatcher, Trussell, and Nelson 2007; Rademacher et al. 2014). Implants are progestin-containing rods that are inserted under the skin and can prevent pregnancy for up to five years (Ramchandran and Upadhyay 2007). The first implant, Norplant, was licensed in 1983 although global production was discontinued in 2008 after a lawsuit accused Norplant of causing scarring, pain upon removal, and other side effects (Rademacher et al. 2014; Ramchandran and Upadhyay 2007). Newer generations of implants are smaller, offer easier insertion and removal, and have fewer complications (Ramchandran and Upadhyay 2007). These include Implanon, Jadelle (Norplant 2), Nexplanon, and Sino-Implant. Although newer implants are less expensive, they are still more cost-effective than other modern methods and become less expensive with continued use (Bertrand et al. 2014; Power, French, and Cowan 2007; Singh and Darroch 2012). Like IUDs, fertility returns rapidly upon discontinuation of implants; they can also be safely inserted immediately after giving birth (Espey and Ogburn 2011; Power, French, and Cowan 2007).

Use of implants has faced barriers of cost and their reputation for side effects and painful insertion or removal (Rademacher et al. 2014). Implants are not the dominant or modal method in any country and are used by less than 1 percent of married women in low-income countries (Ross, Keesbury, and Hardee

[2] The IUD can also be inserted safely after 4 weeks postpartum; however, delayed postpartum (between 48 hours and 4 weeks after delivery) insertion is not recommended (WHO 2015).

2015). In the majority of countries where the share of implants in the method mix is the highest—above 10 percent among all methods in sub-Saharan Africa—there is an increase in use, particularly after the introduction of newer, less expensive implants; however, the share is still low (Bertrand et al. 2014). Bertrand et al. note the potential to improve the method mix with the introduction of the implant which can satisfy the need to both limit and space pregnancies (2014).

Injectables

Injectables are clinically very effective against pregnancy and also are the shortest-acting of the three LARC methods. There are several types of injectables. The first, depot medroxyprogesterone acetate (DPMA, brand name: Depo Provera), which was licensed and marketed in 1960s (Seth, Nagrath, and Deoghare 2012) is a progestin-only injectable which protects against pregnancy for up to three months with a two-week grace period (Adetunji 2011; Seth, Nagrath, and Deoghare 2012). Norethindrone enanthate (NET-EN) is another progestin-only injectable which lasts for two months (Adetunji 2011; Seth, Nagrath, and Deoghare 2012). Combined injectable contraceptives (CICs), such as Cyclofem, Mesigyna and Deladroxate, contain both estrogen and progestin and are only effective for preventing pregnancy for up to 30 days (Seth, Nagrath, and Deoghare 2012). These CICs, however, are not recommended for use while breastfeeding within the first six months postpartum (Seth, Nagrath, and Deoghare 2012; WHO 2015). The failure rate of injectables like DPMA is less than 1 percent (Hatcher, Trussell, and Nelson 2007). Injectables are the least cost effective of the three long-acting methods (Singh and Darroch 2012) and are the only method of the three LARCs that can be passively discontinued. However, injectables cannot be discontinued until the effectiveness period expires, although the return of fertility is delayed, particularly for DPMA and NET-EN (Seth, Nagrath, and Deoghare 2012; WHO 2015).

Injectable use is rising rapidly, particularly in sub-Saharan Africa, because of convenience of use and provision, length of effectiveness, and discretion (Adetunji 2011; Bertrand et al. 2014; Seiber, Bertrand, and Sullivan 2007). Adetunji (2013) found that use of injectables among married women in six recent DHS surveys in sub-Saharan African countries ranged from 6.2 percent in Ghana to 25.8 percent in Malawi, while a larger study of national surveys from 123 countries found that the contraceptive prevalence rate of injectables in all of sub-Saharan Africa was 7.3 percent (Ross, Keesbury, and Hardee 2015). Not having to take a daily pill is a benefit for many women, while others see an advantage to the absence of menses with Depo Provera. Adetunji (2011) reported, tested, and confirmed the theory that secrecy is also a major factor in the use of injectables. The injectable can be easily administered to a woman at a health clinic or through mobile outreach efforts without the permission from her spouse or other family members who may disapprove. These advantages may be responsible for the dramatic increase in injectables during the last 20 years. Bertrand et al (2014) found that this increase was as high as 42 percentage points in Chad and over 25 percentage points in six other countries.

Sterilization

In addition to the three LARC methods described above, sterilization (male or female) is the only other long-term method of preventing pregnancy. For couples wishing to limit births, sterilization is the most cost-effective method when assessing cost over the duration of effectiveness (Seth, Nagrath, and Deoghare 2012). Female sterilization, in particular, is permanent and thus cannot be discontinued. Female sterilization is the most commonly used method across all developing countries (Mansour et al. 2011; Seiber, Bertrand, and Sullivan 2007), although it constitutes a declining share of the method mix in most countries (Bertrand et al. 2014). Female sterilization is a predominant practice in many countries in Latin America, the Caribbean, and Asia (Mansour et al. 2011; Seiber, Bertrand, and Sullivan 2007) and accounts for 31-64 percent of the method share in some countries in those regions (Mansour et al. 2011).

In the Middle East, North Africa and sub-Saharan Africa, sterilization is not common because it is a surgical procedure that requires infrastructure and properly trained providers which are challenging for poor countries (Ross, Keesbury, and Hardee 2015; Seiber, Bertrand, and Sullivan 2007). Use of male sterilization is low at less than three percent of the method share in many low-income countries (Seiber, Bertrand, and Sullivan 2007). In this paper, we group male sterilization with other modern methods. Since we are interested in the life cycle of contraceptive use, female sterilization is not examined further.

1.2 Discontinuation

Of course, no single method is appropriate for all women. Despite their advantages, LARCs have key drawbacks. The use of synthetic progesterone, progestin, in all LARCs is associated with breast pain, weight gain, bloating, and acne or greasy skin (Espey and Ogburn 2011; Lethaby et al. 2015). Changes in menstruation can also occur with LARCs. Some injectables such as Depo Provera suspend menses (Seth, Nagrath, and Deoghare 2012). Implants can cause irregular bleeding and/or amenorrhea (Power, French, and Cowan 2007). Expulsion of IUDs is another potential complication. If an IUD is inserted within 10 minutes of placental delivery, the risk of expulsion is lower than if the IUD is inserted between 10 minutes and 48 hours after delivery, and is lowest when inserted weeks after (The ACQUIRE Project 2008). Serious complications are rare but sometimes occur with IUDs, including perforation of the uterus (Espey and Ogburn 2011). Injectables can cause a loss of bone mineral density, although this side effect is not serious and is also reversible (Seth, Nagrath, and Deoghare 2012). Finally, since LARCs are not barrier methods, they do not prevent sexually transmitted infections (STIs) or HIV (Ali et al. 2011).

Since LARC methods—IUDs, implants, and injectables—comprise an increasing share of contraceptive use, it is important to examine how often and why women discontinue these methods, particularly in low-income countries. Discontinuation of a method occurs when there is method failure (pregnancy), when a woman no longer has a need for contraception (because of a desire to become pregnant, infrequent sex, husband away, marital dissolution, or menopause), or when a woman is dissatisfied with her method or cannot access or afford it. Discontinuation may result in pregnancy, switching to another method, or abandonment of all contraception.

The majority of contraceptive failures result in unwanted births (Ali, Cleland, and Shah 2012; Bradley, Croft, and Rutstein 2011). It is also of concern when contraceptive users DWSIN by switching to a less effective method or abandoning contraception entirely. These latter situations place a woman at risk of unintended and/or unwanted pregnancy. Unintended pregnancy can then lead to potentially unsafe induced abortions where access to safe abortion is restricted, births that pose a risk to the health of the mother and child, and ultimately reduced educational attainment of children (Blanc, Curtis, and Croft 2002; Montgomery et al. 1997; Singh, Sedgh, and Hussain 2010).

Research has repeatedly found that method type is the most important factor in discontinuation (Bradley, Schwandt, and Khan 2009; Montgomery et al. 1997). Properties of methods differ; some, such as condoms, diaphragm, and jelly, are coitus-dependent and must be used continually. Other methods such as pills must be actively continued on a daily basis. Implants and IUDs are designed to be removed with assistance of a provider, which makes discontinuation more difficult. Empirically, traditional and short acting methods have the highest rates of discontinuation; LARCs, such as IUDs, have the lowest rate (Bradley, Schwandt, and Khan 2009; Curtis and Blanc 1997; Montgomery et al. 1997). In 2009, Bradley et al. found the 12-month discontinuation rate of IUDs in 11 Demographic and Health Survey (DHS) surveys to be less than 18 percent in one year while another, more recent study of 60 DHS countries found the 12-month discontinuation rate of IUDs to be even less—13 percent (Montgomery et al. 1997).

In areas where women have informed choice about contraceptive methods, there is presumably some endogeneity between method choice and intention. Married women who are looking to space or limit births might find LARC methods more appropriate than shorter-term or coitus-dependent methods. For these reasons, this report analyzes discontinuation by method type, and treats LARC methods separately from traditional/folkloric methods and all other modern methods.

Reasons for discontinuation also differ by method. General reasons include dissatisfaction or method-related reasons such as health concerns or side effects; lack of access by cost or distance to a facility; or husband/family disapproval (Ali, Cleland, and Shah 2012; Bradley, Schwandt, and Khan 2009; Curtis and Blanc 1997; Moreau, Cleland, and Trussell 2007). Side effects and health concerns are the most common reason for discontinuing short acting methods, while reasons for discontinuing condoms or traditional methods include unintended pregnancy or the desire for a more effective method. Reasons for discontinuation of IUDs vary but frequently include dissatisfaction with the method or side effects (Ali et al. 2011; Bradley, Schwandt, and Khan 2009). When discontinuing IUDs for method-related reasons, half of the women switched to another modern method, with over 10 percent to traditional methods (Ali et al. 2011).

Because of low use, implant discontinuation rates are less well studied. One review found that the 5 year cumulative continuation rate was just over 50 percent (Power, French, and Cowan 2007). Injectables are unique because they are the shortest-acting of all the long-acting methods (one, two, or three months) and they cannot be voluntarily discontinued before expiration. Users must actively seek out another injection in order to continue use. Varying discontinuation rates for injectables have been found. Twelve month rates of discontinuations range from 18 to 67 percent (Bradley, Schwandt, and Khan 2009), although this range could be the result of the higher likelihood of discontinuation of one-month injectables versus three-month injectables, which were not differentiated in this report. Ali, Cleland and Shah (2012) found an average discontinuation rate to be 41 percent over 12 months with a large range across countries as well.

Prior studies have also shown that rates of discontinuation also vary by women's characteristics. Slower time to discontinuation is associated with age (over 25 compared to 15-24), higher education, and in some case, higher parity (Bradley, Schwandt, and Khan 2009).

1.3 Programmatic Environment

Although LARCs are not appropriate for every woman or every couple, they are the most cost-effective and long-term reversible means of preventing unintended pregnancy. As such, LARCs comprise an important part of total method choice. To support use of IUDs and implants, countries must ensure that women have access to competent health services that can safely provide insertion and removal services (Singh and Darroch 2012). Beyond individual preferences, variations in use may indicate differences in policy, national promotion of the method, or provider bias (Ali et al. 2011). When the share of IUDs in the method mix ranges from less than 1 percent to 66 percent, it seems likely that availability and service provision are influencing use.

Nearly all low-income countries have established programs to improve family planning services, although the quality and availability of these programs vary widely. Convened in London in July 2012, the Family Planning Summit 2020 designated the funding and political support for reaching a goal that would improve women's right to—and availability of—contraceptive information, access, and commodities among 120 million more women in the poorest countries by 2020 (FP2020 2015). Family Planning 2020 (FP2020) is a partnership born from this summit and created to facilitate these improvements and to draw

attention to the supply and service provision of contraceptive methods. This report focuses on 21 of the FP2020 focus countries.

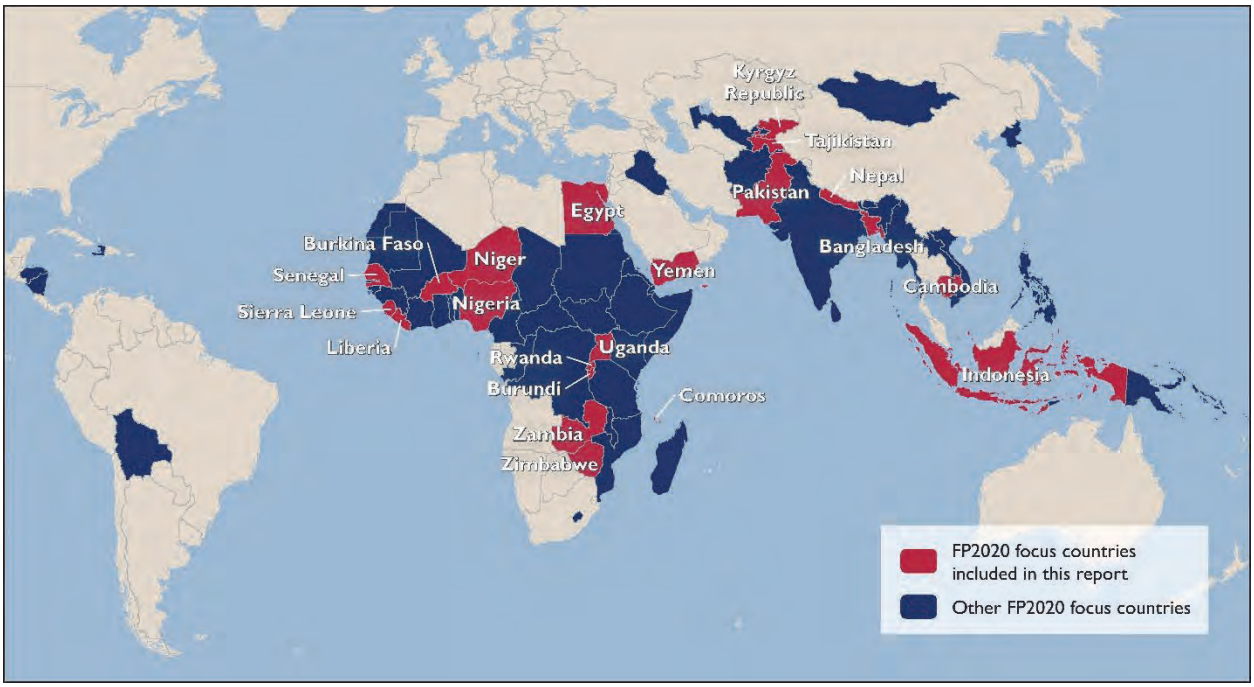
Previous studies have found that increasing method choice and availability have the potential to improve both rates of DWSIN and unmet need while reducing the risks associated with unintended pregnancy (Ross and Stover 2013). Less is known about how the policy environment relates to discontinuation. How do access and availability of specific methods and overall programmatic quality affect discontinuation and failure rates for those methods?

This paper focuses on uptake and discontinuation of LARC methods in low-income, FP2020 priority countries. The paper begins with how women start these methods, the extent of current use, discontinuation rates in past 5 years, reasons for discontinuation, and status following discontinuation. The focus then moves to testing the importance of women's characteristics, method availability, and quality of FP programs on the risk of DWSIN.

2. Data and Methods

Study countries were selected from among FP2020's list of 69 focus countries, as shown in Appendix A. These are the 69 poorest countries in the world: in 2010, these countries were estimated to have less than $2,500 gross domestic product (GDP) per capita. From these 69 countries, we selected all countries with a DHS survey fielded during or after 2010 that included a contraceptive calendar with the reasons for discontinuation. There were 23 such countries. All 21 of 23 viable surveys[3] were included in this study. Figure 2.1 indicates the 21 study countries in red and the 48 other FP2020 focus countries in blue.

Figure 2.1 Map of study countries



The DHS sample size of married[4] women for each survey is listed in Table 2.1, along with contraceptive prevalence (any method) among married women. Countries are sorted by world region: 6 in West Africa, 6 in East and Southern Africa, 2 in North Africa and West Asia, 2 in Central Asia, and 5 in South and Southeast Asia. The weighted sample size of married FP users ranged from 632 (Comoros) to 20,704 (Indonesia). Table 2.1 also lists the overall population size of the country in 2010 (in thousands). Pooled estimates in later chapters normalize the DHS weights relative to overall population size.[5] The countries range in size from less than one million to more than two hundred million. The most populous countries studied in this report are Indonesia, Pakistan Nigeria, and Bangladesh. The least populous countries studied are Comoros, Liberia, and Kyrgyz Republic.

[3] The Mozambique 2010 DHS had an insufficient number of episodes for most analysis and was excluded. The 2011-12 Benin DHS was excluded due to hundreds of missing calendar entries.
[4] Includes married and living with a man as if married.
[5] Note that the number of married women age 15 to 49 in each country is not perfectly proportional to national population size, as this will depend on age structure and nuptiality. Nonetheless it was the best option to provide relative scaling of the weights.

Table 2.1. Total population size and DHS sample size of currently married women 15-49, by country

Country	Total population size 2010 (thousands)[1]	Year of DHS survey	Sample size of currently married women[2] age 15-49	Total Contraceptive Prevalence (%)[3]	Sample size of currently married family planning users age 15-49
West Africa					
Burkina Faso	15,632	2010	13,563	16.2	2,194
Liberia	3,958	2013	5,386	20.2	1,090
Niger	16,292	2012	9,881	13.9	1,374
Nigeria	159,425	2013	27,830	15.1	4,216
Senegal	12,957	2014	5,500	22.2	1,219
Sierra Leone	5,776	2013	10,903	16.6	1,813
East and Southern Africa					
Burundi	9,461	2010	5,421	21.9	1,185
Comoros	699	2012	3,261	19.4	632
Rwanda	10,294	2010	6,897	51.6	3,558
Uganda	33,149	2011	5,418	30.0	1,626
Zambia	13,917	2013-14	9,859	49.0	4,832
Zimbabwe	13,974	2010-11	5,703	58.5	3,338
North Africa and West Asia					
Egypt	82,041	2014	20,460	58.5	11,974
Yemen	23,592	2013	15,566	33.5	5,213
Central Asia					
Kyrgyz Republic	5,465	2012	5,256	36.3	1,907
Tajikistan	7,582	2012	6,504	27.9	1,816
South and Southeast Asia					
Bangladesh	151,617	2011	16,635	61.2	10,183
Cambodia	14,364	2010	11,626	50.5	5,876
Indonesia	241,613	2012	33,465	61.9	20,704
Nepal	26,876	2011	9,608	49.7	4,774
Pakistan	170,044	2012-13	12,937	35.4	4,581

[1] United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision, custom data acquired via website.
[2] Here and throughout the report, currently married means married or living with a man as if married
[3] The percent of married women age 15-49 using any method of family planning.
Per DHS convention, sample sizes are weighted

2.1 Data

2.1.1 Survey data

In the DHS surveys analyzed in this report, women were asked about all episodes of contraceptive use that extended back at least five years[6] preceding the date of interview. These 'contraceptive calendar' data are retrospective records of births, pregnancies, and family planning use. The calendar allows one event per month: a pregnancy, birth, or termination; if none of these applies, it indicates whether family planning was used, and if so, which method.[7] In the countries we studied, the calendar also included a

[6] Women are frequently asked about slightly longer periods of time, up to 70 or 80 months, but those earlier entries were truncated as indicated in order to standardize the length across surveys.
[7] Interviewers are asked to first fill in the pregnancies and births from the birth history, then to probe episodes of use and non-use. Interviewers receive extensive training on the calendar. Illustrative questions provided to interviewers in the questionnaire include: When was the last time you used a method? Which method was that? When did you start using that method? How long after the birth of (NAME)? How long did you use the method then? Why did you stop using the (METHOD)? Did you become pregnant while using (METHOD), or did you stop to get pregnant, or did you stop for some other reason?

second column where women were asked to identify the main reason for every episode of contraceptive discontinuation.

There are possible concerns about the calendar data. First is the issue of recall (particularly for short-term and coitus-dependent methods) and underreporting of prior method use. Previous studies have found broad consistency in calendar data compared to retrospective contraceptive prevalence (Bradley, Schwandt, and Khan 2009; Curtis and Blanc 1997; Strickler et al. 1997). A more recent study found that in more than one-fourth of countries, injectables, pills, and traditional methods appear to be signficantly underreported in the calendar and in more than half of countries LAM and male condom use appears to be significantly underreported (Bradley, Winfrey, and Croft 2015). Second, dual use of methods such as both injectables and condoms are not recorded in the calendar. Interviewers are instructed to record the most effective method used by the woman. Third, even with perfect recall, rounding to the nearest whole month introduces some measurement issues. Women do not generally stop and start methods in whole month intervals; a period of one week would be recorded as one month, while a period of five weeks would necessarily span two months. This is one reason why we avoid making estimates of median duration of use. An additional concern for estimates of median use is left-censoring of longer-term methods that started before the calendar. IUDs are designed to be used for ten to twelve years while the calendar only spans five years. Despite data concerns, these data are the most complete, representative, and accurate picture of cross-country contraceptive dynamics.

With the exception of contraceptive method mix in Chapter 3, the unit of the analysis in this study is a continuous episode of contraceptive use. We only include episodes among women currently married or in union at the time of survey whose date of first union was at or prior to the date the episode began. Each of these episodes that are discontinued (versus ongoing at the time of the survey) are associated with a discontinuation code. Women may contribute more than one episode over the course of the five years prior to the survey, or zero episodes if they have not used any method. In addition, we exclude episodes from women who are currently unmarried or had not yet had a first union at or prior to the date of starting contraceptive use.

The sample size of episodes depends on the type of analysis. In some cases such as reasons for discontinuation, only episodes that ended during the period are considered. In other cases such as discontinuation rates, episodes must be started in the period but right-censoring (ongoing use) is allowed. For discontinuation rates, it is standard to consider the 3 to 62 months prior to the calendar: the month of interview and the two preceding months are ignored to avoid the bias that might be introduced by an unrecognized pregnancy. When possible, we have maintained this convention in order to standardize the number of cases. Sample size is listed for each analysis separately.

For the purpose of this paper, family planning methods are divided into five categories:

- **IUD, implants, and injectables** are the three LARC methods that each comprise their own category. Except in very rare circumstances, the type of IUD (hormonal or non-hormonal) and the duration of the injectable (1 to 3 months) is unspecified. In older surveys, the brand name of implants was frequently specified as Norplant; several more recent surveys ask only about implants.

- **Non-LARC modern methods excluding female sterilization** are combined into a reference group because the focus of the paper is LARCs. These other modern methods include pill, male condoms, female condoms, foam/jelly, diaphragm, emergency contraception, lactational

amenorrhea method (LAM), standard days, male sterilization, and other unspecified modern methods. The composition of these methods varies by country and is described in Chapter 3. Female sterilization is excluded from episodic analysis since it cannot be discontinued.

- **Traditional/folkloric methods.** This category primarily includes traditional methods such as periodic abstinence and withdrawal, but may also inlcude herbs, massage, and other folkloric methods.

Reasons for discontinuation are mutually exclusive. Women are asked about the main reason for discontinuation of each method. Response options include failure (became pregnant while using), method-related reasons (side effects and health concerns, inconvenient to use, desire for more effective method), access/cost, and perceived lack of need (desire to become pregnant, marital dissolution, infrequent sex/husband away, and menopause). Individual questionnaires for each survey provide the full range of responses.

For the purposes of this report:

- **Discontinuation while still in need (DWSIN)** includes becoming pregnant while using the method (failure), method-related reasons, cost/access, opposition, and other reasons unrelated to lack of need. DWSIN does not necessarily refer to 'unmet need,' a term which is based on a fixed set of criteria for fecundity, fertility preferences, and non-use. Instead, DWSIN means that, from a number of mutually-exclusive choices that describe her reason for stopping use, a respondent said that she stopped for reasons other than not needing contraception.

- **Discontinuation due to no further need** includes desire to become pregnant, marital dissolution, infrequent sex/husband away, and menopause. As with DWSIN, 'no further need' refers the respondent's perception of her need rather than to unmet need. For example, a husband's absence, even long-term, is not considered exclusionary from the DHS definition of unmet need, since the husband may return at any time.

2.1.2 Family Planning Effort Scores

One measure of the strength of national FP programmatic efforts within low-income countries is the Family Planning Effort (FPE) Index scores, which have been calculated periodically since 1972 (Ross and Smith 2010).

The FPE Index scores are calculated from questionnaires completed by local country experts within each country. Experts rate aspects of FP programmatic efforts within four domains—Policies, Services, Environment, and Method Access. Specific questions include the overall quality of FP programs and the availability of particular methods (Ross and Smith 2010; Ross and Hardee 2012). Some items have been added to the index over time to account for new methods being added to the method mix, such as the injectables in 2004 and implants in the 2014 round (Ross and Stover 2013).

The FPE scores used in this report are availability scores for the three LARC methods: IUDs, implants, and injectables. The scores for IUDs and injectables are from 2009, a year which overlaps with the time period of survey in every country studied. Implant scores were first measured in 2014. The scores are designed to gauge the "extent to which the entire population and ready and easy access" to each of the

LARC methods within a given country. The quality metric is based on experts' rating of the general quality of family planning services. The questionnaire states that "good quality includes a focus on client needs, with counseling, full information, wide method choice, and safe clinical procedures" (Ross and Smith 2010).

2.2 Methods

Descriptive statistics are computed among the episodes that occurred to currently married or in union women whose date of first marriage was at or prior to the date the episode began. For pooled estimates, we re-normalize DHS weights to population size, based on 2010 UN population estimates. Computations of discontinuation rates are based on multi-decrement life tables from episodes 3 to 62 months prior to the survey. The month of interview and the two preceding months are ignored to avoid the bias that might be introduced by an unrecognized pregnancy. The rates represent the probability of discontinuing use of a method within 12, 24, or 36 months of starting.

The regression models are multilevel hazard models, which analyze time to an outcome by using country random effects. This enables clustering based on country characteristics. We analyze women within countries and their hazard of discontinuing a particular method while still in need. All other types of discontinuations (including no further need) are considered right-censored. We use a multilevel Weibull regression model, which is a more flexible alternative to the exponential hazard model (Box-Steffensmeier and Jones 2004). A Weibull model of contraceptive discontinuation has advantages over a Cox model because it allows for accelerated levels of failure over time in contraceptive use (Ali, Marshall, and Babiker 2001; Creanga et al. 2007). Population-level weights are used to ensure consistency with descriptive analysis. The multilevel models allow for fixed effects by characteristics and random intercepts by country. We first model unadjusted coefficients with country random effects; adjusted models incorporate individual characteristics, FPE access scores, overall method prevalence, and FP program quality scores.

3. Starting and Using LARCs

3.1 Current use of LARCs

LARCs are an important source of method choice for women and couples motivated to plan and space births for the minimum amount of time recommended by WHO. Table 3.1 illustrates the overall composition of method mix by country among currently married women. There is enormous diversity in LARC use across countries. The share of IUD use is typically less than 10 percent in most countries and it is not used at all in Liberia. However, the proportion of IUD use alone surpasses 50 percent in three countries: Egypt, Kyrgyz Republic, and Tajikistan. In these countries, implant use is practically non-existent, although implant use is low in most countries. Implants comprise only 10 percent or less of the proportion of all methods used in 16 of the 21 countries. The proportion of implants is the most substantial in Burkina Faso and Senegal—over 20 percent of each country's method mix.

By far, the largest overall proportions of any one LARC method are injectables in most countries. Injectables dominate the method mix in Indonesia, Rwanda, and Liberia and hold the largest share of any method in five other countries: Zambia, Uganda, Sierra Leone, Burundi, and Senegal. The lowest shares of injectables are in Kyrgyz Republic, Tajikistan, and Pakistan. Other modern methods dominate in Zimbabwe, Niger, and Bangladesh, while traditional methods hold the largest share in Nigeria and Cambodia. The highest proportions of female sterilization are seen in Nepal and Pakistan.

Table 3.1. Family planning method mix, by country

Among married women age 15-49, the percent of all users who use specified method

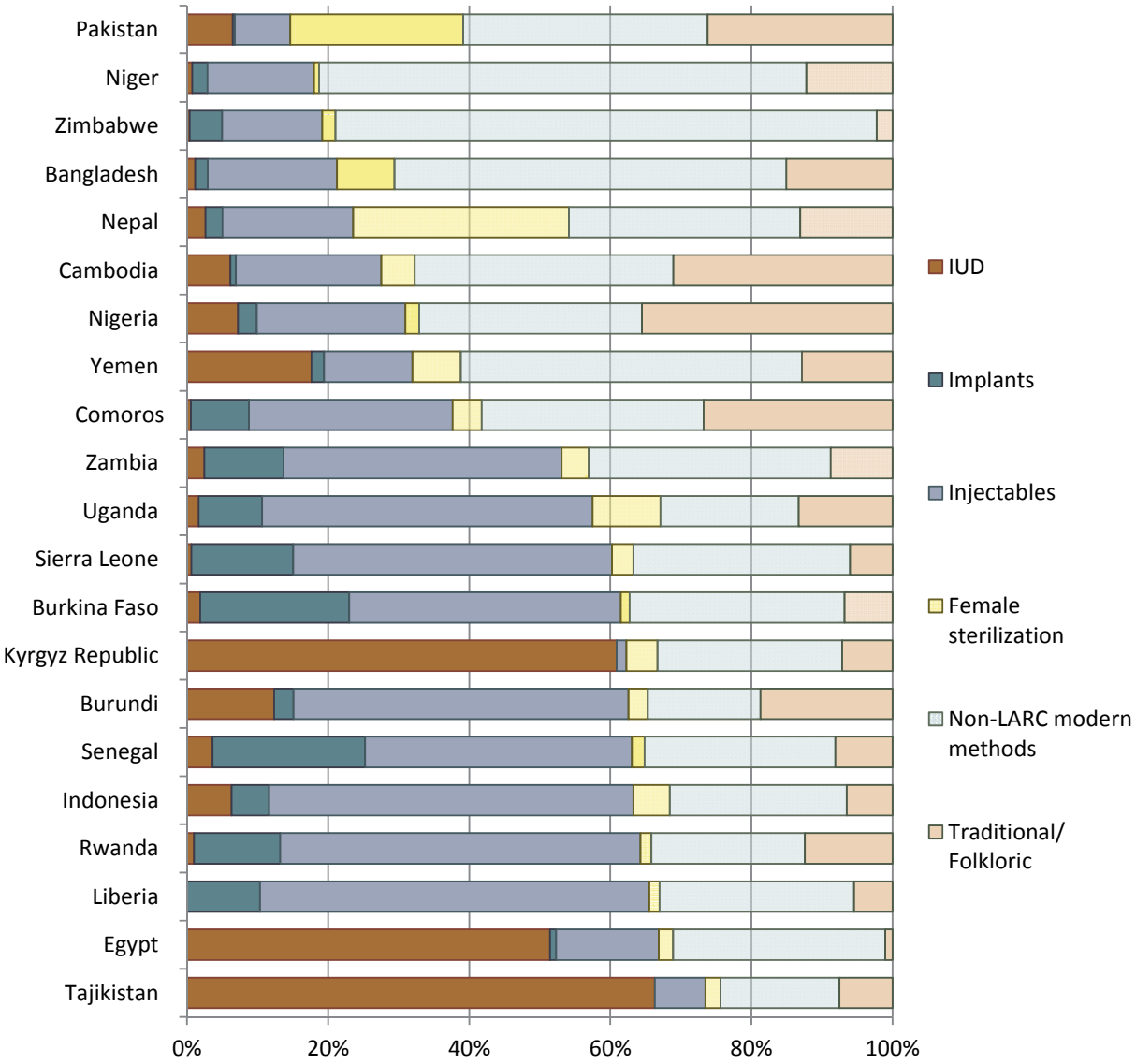
Country	IUD	Implants	Inject-ables	Female sterili-zation	Pill	Condom	Male sterili-zation	Other modern methods	Tradi-tional/ Folkloric	Total	Number of family planning users
West Africa											
Burkina Faso	1.6	21.3	38.6	1.1	19.7	9.7	0.0	1.0	7.0	100.0	2,194
Liberia	0.0	10.2	55.4	1.4	24.7	2.1	0.0	0.7	5.5	100.0	1,090
Niger	0.5	2.2	15.4	1.0	40.2	0.3	0.0	28.2	12.2	100.0	1,374
Nigeria	7.1	2.5	21.0	2.3	12.1	13.8	0.0	5.7	35.5	100.0	4,216
Senegal	3.8	21.6	37.7	1.7	23.3	2.8	0.0	0.8	8.3	100.0	1,219
Sierra Leone	0.7	14.6	45.2	2.8	23.4	1.4	0.1	5.6	6.2	100.0	1,813
East and Southern Africa											
Burundi	12.5	2.6	47.5	2.7	11.2	4.4	0.3	0.3	18.9	100.0	1,185
Comoros	0.3	8.1	29.1	4.3	16.1	11.1	4.2	4.2	26.9	100.0	632
Rwanda	0.9	12.2	50.9	1.6	13.8	5.6	0.1	2.2	12.5	100.0	3,558
Uganda	1.8	8.9	46.8	9.6	9.7	9.0	0.3	0.6	13.3	100.0	1,626
Zambia	2.4	11.3	39.4	3.8	24.0	8.2	0.1	2.1	8.7	100.0	4,832
Zimbabwe	0.3	4.7	14.2	1.9	70.6	5.3	0.0	0.9	2.2	100.0	3,338
North Africa and West Asia											
Egypt	51.4	0.9	14.5	2.1	27.4	0.8	0.0	1.9	1.0	100.0	11,974
Yemen	17.7	1.7	12.5	6.8	34.7	1.6	0.2	12.0	12.9	100.0	5,213
Central Asia											
Kyrgyz Republic	60.9	0.0	1.4	4.4	4.2	21.1	0.0	0.8	7.2	100.0	1,907
Tajikistan	66.4	0.2	7.1	2.1	8.2	8.0	0.0	0.5	7.5	100.0	1,816
South and Southeast Asia											
Bangladesh	1.2	1.9	18.3	8.1	44.5	9.0	2.0	0.0	15.0	100.0	10,183
Cambodia	6.1	0.9	20.6	4.7	30.4	5.4	0.1	0.8	31.0	100.0	5,876
Indonesia	6.3	5.4	51.6	5.2	21.9	2.8	0.3	0.1	6.5	100.0	20,704
Nepal	2.6	2.4	18.5	30.5	8.3	8.7	15.8	0.0	13.2	100.0	4,774
Pakistan	6.5	0.2	7.8	24.4	4.5	24.9	0.7	4.7	26.3	100.0	4,581

Notes: Other modern methods include foam/jelly, diaphragm, female condom, emergency contraception, LAM, standard days, and other unspecified modern methods. Percentages may not sum to 100 due to rounding.

Figure 3.1 shows the distribution of methods, particularly LARC methods, among married women who currently use any modern or traditional method in 21 DHS countries at the time of the most recent survey. Among users, the three LARC methods combined dominate the method mix (over 50 percent) in more than half of these countries. The smallest proportion of LARC use among contraceptives users appears in Pakistan (15 percent), while the largest proportion appears in Tajikistan (over 70 percent).

Figure 3.1. Share of LARCs in method mix

Among currently married women age 15-49, by country, in increasing order of LARC method use



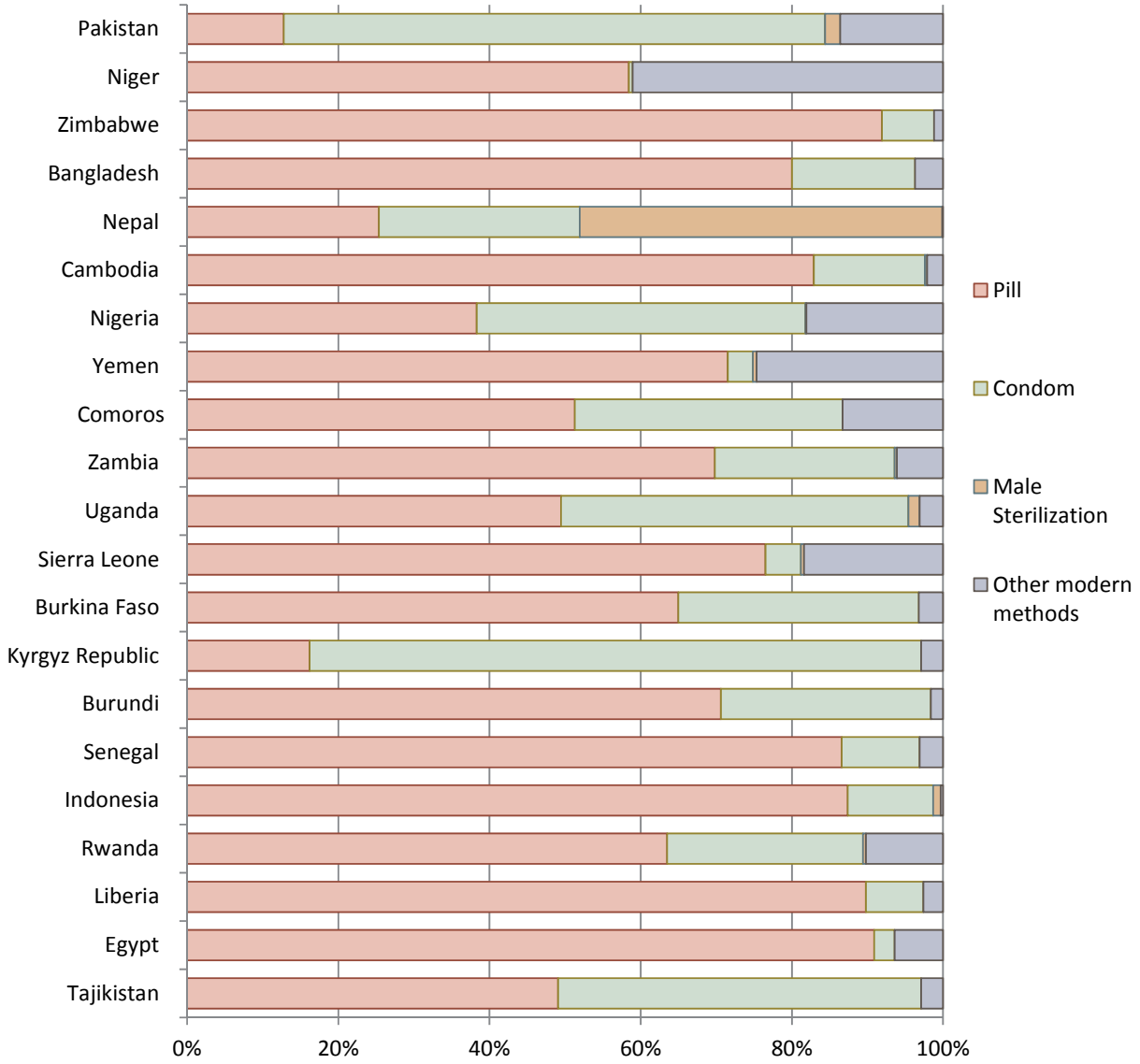
Notes: Non-LARC modern methods include pill, condom, foam/jelly, diaphragm, female condom, emergency contraception, LAM, standard days, male sterilization, and other unspecified modern methods.

Figure 3.2 depicts the distribution of other modern methods among contraceptive users, excluding LARCs and female sterilization. These non-LARC modern methods are later grouped, and their composition will influence results such as discontinuation rates. The pill holds the largest share of other modern methods in most countries and comprises approximately 90 percent of non-LARC modern methods in Zimbabwe, Egypt and Liberia as well as approximately half of the share in 17 countries. The pill is used least among all modern methods in Pakistan, where condoms dominate the other modern method's share. The condom

is also a widely used other modern method in the Kyrgyz Republic, Tajikistan, and Uganda. Male sterilization is dominant in Nepal, where it is almost half of the proportion of all other modern methods. It is relatively non-existent in all other countries.

Figure 3.2. Composition of non-LARC modern methods excluding female sterilization

Among currently married women 15-49, by country, in order of Figure 3.1



Note: 'Other modern' includes foam/jelly, diaphragm, female condom, emergency contraception, LAM, standard days, and other-unspecified.

3.2 Adoption of LARCs

While method mix and women's current use of family planning is a heavily-researched area, less is known about how and when women adopt a method. A full picture of contraceptive dynamics requires an understanding of method adoption as well as discontinuation. Switching methods may indicate problems with the previous method, or—for LARCs in particular—women's desire for a more effective or longer-term method. Starting a modern method during the postpartum period may reflect specific postpartum

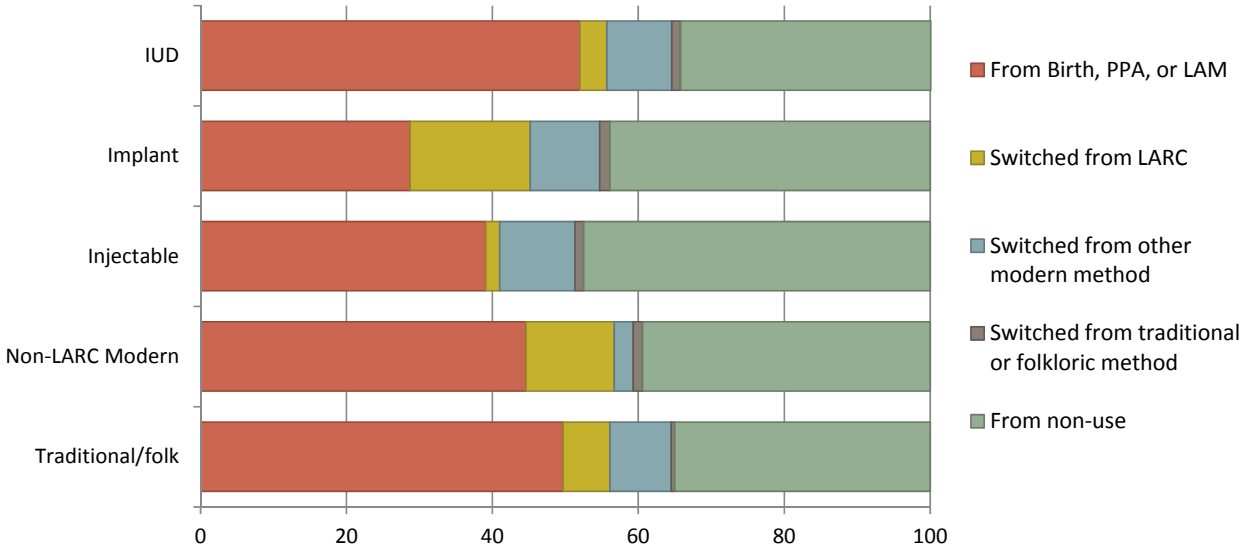
programs in place, and counseling during the antenatal period and at the time of delivery if women received services from trained providers and facilities.[8]

Figure 3.3 depicts the pooled and re-weighted average, across all 21 countries, of the event immediately preceding uptake in the past five years, by method type. Women are classified as switching from another method, as coming from an episode of non-use (including termination of a pregnancy), or as coming from birth, postpartum abstinence (PPA), lactational amenorrhea (LAM), or extended breastfeeding. In the latter category, birth, LAM, and extended breastfeeding are whole month calendar entries and thus mutually exclusive with other contraceptive method use. However, the calendar does not indicate sexual activity. In the case of PPA, the duration of abstinence is recorded separately from the calendar. Women are classified as coming from PPA if the period of PPA co-occurred during the start of method use, or in the month immediately prior to the start of method use, and the woman was not using any other method immediately prior to adoption of the new method.

Across focal countries, IUDs and traditional/folkloric methods were the methods most commonly started after birth, LAM/extended breastfeeding, or PPA. Meanwhile, the majority of episodes of injectable use were started after non-use. Previous LARC use more commonly preceded implants and non-LARC modern methods.

Figure 3.3. Arrival at method use: Pooled results

Event prior to starting an episode of method use, all episodes among married women begun in past five years, by method type.



Notes: Pooled results are averaged across all 21 countries, using DHS weights normalized relative to national population size according to United Nations (2010) estimates shown in Table 2.1. Computed among episodes of use begun 0 to 59 months before interview among women 15-49 currently married or in union whose date of first union occurred at or prior to the start of the episode. Women are classified as coming from birth, post-partum abstinence (PPA), lactational amenorrhea method (LAM), and extended breastfeeding if any of these events immediately preceded the month that they started the event, or--in the case of PPA--if it co-occurred during the month a woman started contraception. PPA may be any self-reported length, from 1 to 60 months. If a woman reported both PPA and switching from another method, preference was given to switching from the other method.

[8] Because the contraceptive calendar spans the same five-year time period as questions about place of delivery, skill of delivery provider, and antenatal care it was not possible to pinpoint recency of health services surrounding a birth for episodes very early in the calendar. Therefore we opted to examine births, PPA, LAM, and extended breastfeeding as being sources of transition to a method.

Tables 3.2 to 3.6 indicate the event immediately preceding adoption of each method by country. Table 3.2 shows arrival at IUD use. In five countries, there was insufficient sample size (fewer than 25 unweighted cases) to calculate reliable estimates; in five additional countries, a small sample size (25-49 unweighted cases) means that estimates should be interpreted with caution. Across the remaining countries, over half of all episodes of IUD use started immediately after birth, LAM, or during/after postpartum abstinence. Notably, the percentage of women in that category was highest in Egypt (73 percent) and above 40 percent in Indonesia, Zambia, and Tajikistan. The percentage of women starting an IUD after birth, LAM, or PPA was lowest in Uganda, Nepal, Burundi, and Bangladesh.

Table 3.2. Arrival at IUD use

Event immediately prior to starting an episode of IUD use, episodes among married women begun in past five years, by country.

Country	From Birth, PPA, or LAM[1]	Switched from other LARC (implant or injectable)	Switched from other modern method	Switched from traditional or folkloric method	From non-use	Total	Number of episodes
West Africa							
Burkina Faso 2010	22.1	7.7	3.7	1.6	64.9	100.0	(47)
Liberia 2013	*	*	*	*	*		2
Niger 2012	*	*	*	*	*		12
Nigeria 2013	23.1	4.3	3.7	5.1	63.8	100.0	282
Senegal 2014	14.5	1.3	11.1	0.0	73.1	100.0	(42)
Sierra Leone 2013	*	*	*	*	*		(24)
East and Southern Africa							
Burundi 2010	18.0	17.3	1.2	2.3	61.2	100.0	176
Comoros 2012	*	*	*	*	*		2
Rwanda 2010	22.9	15.2	1.7	2.6	57.5	100.0	(33)
Uganda 2011	12.3	12.7	0.0	0.0	75.0	100.0	(42)
Zambia 2013-14	48.0	5.6	11.7	4.4	30.3	100.0	134
Zimbabwe 2010-11	*	*	*	*	*		10
North Africa and West Asia							
Egypt 2014	72.5	1.7	8.8	0.1	16.9	100.0	5,660
Yemen 2013	20.2	2.8	18.2	3.1	55.7	100.0	1,143
Central Asia							
Kyrgyz Republic 2012	18.0	0.5	3.3	1.3	76.9	100.0	1,005
Tajikistan 2012	36.6	0.2	2.2	0.5	60.5	100.0	1,004
South and Southeast Asia							
Bangladesh 2011	10.1	11.3	36.9	3.9	37.9	100.0	125
Cambodia 2010	18.5	4.6	11.5	3.9	61.5	100.0	339
Indonesia 2012	47.2	19.5	9.6	1.0	22.6	100.0	798
Nepal 2011	8.1	16.7	9.0	8.7	57.5	100.0	122
Pakistan 2012-13	34.1	2.5	7.1	3.9	52.3	100.0	503
TOTAL	**53.3**	**4.9**	**9.2**	**1.4**	**31.2**	**100.0**	**11,503**

Notes: An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed. Figures in parentheses are based on 25-49 unweighted cases. Computed among episodes of use begun 0 to 59 months before interview among women 15-49 currently married or in union whose date of first union occurred at or prior to the start of the episode. Total is an average across all 21 countries, using DHS weights normalized relative to national population size according to United Nations (2010) estimates shown in Table 2.1.

[1] Women are classified as coming from birth, post-partum abstinence (PPA), lactational amenorrhea (LAM), and extended breastfeeding if any of these events immediately preceded the month that they started the event, or--in the case of PPA--if it co-occurred during the month a woman started contraception. PPA may be any self-reported length, from 1 to 60 months. If a woman reported both PPA and switching from another method, preference was given to switching from the other method.

Table 3.2 shows the event immediately preceding an episode of implants by country. This indicates that implants were more commonly preceded by non-use or another modern method than IUDs. In Egypt, Senegal, and Niger, however, at least 40 percent of episodes began after birth, postpartum abstinence, or LAM/ extended breastfeeding. The most common event preceding an implant was non-use.

According to Table 3.3, which shows arrival at injectable use, the portion of episodes begun after birth, LAM, or PPA was particularly high in Indonesia, Egypt, Niger, Zimbabwe, and Senegal. In Bangladesh more than one-third of injectable episodes were immediately preceded by another modern method.

Table 3.3. Arrival at implant use

Event immediately prior to starting an episode of implant use, episodes among married women begun in past five years, by country

Country	From Birth, PPA, or LAM	Switched from other LARC (IUD or injectable)	Switched from other modern method	Switched from traditional or folkloric method	From non-use	Total	Number of episodes
West Africa							
Burkina Faso 2010	34.2	2.3	1.6	0.5	61.3	100.0	489
Liberia 2013	23.3	1.6	0.0	0.0	75.1	100.0	114
Niger 2012	41.5	3.0	19.0	1.8	34.8	100.0	(37)
Nigeria 2013	30.6	1.5	1.2	1.7	65.0	100.0	103
Senegal 2014	48.8	1.1	1.9	0.1	48.0	100.0	296
Sierra Leone 2013	22.8	1.7	8.0	0.0	67.5	100.0	316
East and Southern Africa							
Burundi 2010	34.0	13.5	0.3	1.4	50.9	100.0	(36)
Comoros 2012	30.5	0.7	1.6	0.0	67.1	100.0	67
Rwanda 2010	8.9	33.3	4.5	1.9	51.4	100.0	491
Uganda 2011	25.6	10.7	8.3	1.5	53.9	100.0	177
Zambia 2013-14	35.1	7.4	9.6	2.6	45.3	100.0	640
Zimbabwe 2010-11	28.3	12.8	29.5	0.0	29.3	100.0	153
North Africa and West Asia							
Egypt 2014	51.9	13.9	11.9	0.0	22.3	100.0	180
Yemen 2013	18.3	6.8	21.7	0.6	52.7	100.0	182
Central Asia							
Kyrgyz Republic 2012	*	*	*	*	*		0
Tajikistan 2012	*	*	*	*	*		5
South and Southeast Asia							
Bangladesh 2011	13.9	15.3	31.9	3.1	35.7	100.0	206
Cambodia 2010	12.1	0.5	18.6	9.4	59.3	100.0	60
Indonesia 2012	26.7	37.2	10.3	1.3	24.4	100.0	1,167
Nepal 2011	7.8	14.9	8.4	5.1	63.8	100.0	101
Pakistan 2012-13	*	*	*	*	*		10
TOTAL	**26.9**	**23.9**	**11.9**	**1.5**	**35.7**	**100.0**	**4,831**

Notes: See Table 3.2

Table 3.4. Arrival at injectable use

Event immediately prior to starting an episode of injectable use, episodes among married women begun in past five years, by country

Country	From Birth, PPA, or LAM	Switched from other LARC (IUD or implant)	Switched from other modern method	Switched from traditional or folkloric method	From non-use	Total	Number of episodes
West Africa							
Burkina Faso 2010	33.3	0.8	1.9	0.4	63.6	100.0	1,387
Liberia 2013	22.6	0.0	1.7	0.3	75.3	100.0	901
Niger 2012	47.3	0.0	10.2	0.2	42.3	100.0	552
Nigeria 2013	30.1	0.2	3.0	1.7	65.0	100.0	1,221
Senegal 2014	39.5	0.8	2.8	0.2	56.6	100.0	828
Sierra Leone 2013	22.9	0.6	3.7	0.4	72.4	100.0	1,205
East and Southern Africa							
Burundi 2010	22.0	0.4	4.1	0.6	72.9	100.0	1,126
Comoros 2012	25.9	0.6	0.3	0.0	73.3	100.0	285
Rwanda 2010	12.7	0.4	8.1	1.3	77.6	100.0	2,866
Uganda 2011	23.1	0.2	3.7	1.0	72.1	100.0	1,611
Zambia 2013-14	33.9	1.5	9.4	2.8	52.5	100.0	3,204
Zimbabwe 2010-11	47.7	0.5	21.2	0.6	30.0	100.0	749
North Africa and West Asia							
Egypt 2014	57.9	10.0	10.2	0.0	21.9	100.0	2,685
Yemen 2013	13.6	2.6	12.1	1.3	70.5	100.0	1,435
Central Asia							
Kyrgyz Republic 2012	7.4	8.8	8.1	0.5	75.2	100.0	50
Tajikistan 2012	15.9	5.0	5.2	0.8	73.1	100.0	197
South and Southeast Asia							
Bangladesh 2011	17.2	1.2	35.2	3.3	43.1	100.0	2,694
Cambodia 2010	19.9	0.6	7.5	2.5	69.5	100.0	1,570
Indonesia 2012	58.3	2.1	11.6	0.8	27.2	100.0	12,601
Nepal 2011	18.5	1.0	4.4	1.3	74.8	100.0	1,716
Pakistan 2012-13	33.4	3.2	4.1	1.5	57.8	100.0	966
TOTAL	**43.2**	**2.2**	**12.8**	**1.3**	**40.6**	**100.0**	**39,845**

Notes: See Table 3.2

Non-LARC modern methods, excluding female sterilization, and traditional methods are the two reference groups considered in this study. Table 3.5, which shows arrival at non-LARC modern methods combined, indicates that in six countries—Niger, Nigeria, Zimbabwe, Egypt, Tajikistan, and Pakistan—more than half of women began a non-LARC modern method directly after a birth, or from LAM, extended breastfeeding, or PPA. Meanwhile, more than 12 percent of episodes of non-LARC modern methods in Bangladesh and Indonesia began after an episode of LARC use. The proportion whose modern method use was immediately preceded by a more effective (LARC) method was strikingly high in Indonesia (47 percent), and was also high in Rwanda (18 percent) and Egypt (15 percent).

In 11 of 21 countries considered, more than half of the episodes of traditional or folkloric method use were arrived at after birth, extended breastfeeding, PPA or LAM (Table 3.6). Traditional and folkloric methods were arrived at more commonly from non-use in Burkina Faso, Sierra Leone, Burundi, Rwanda, and Nepal. They are more heavily favored by women switching from a LARC or other modern method in Bangladesh and Indonesia.

Table 3.5. Arrival at non-LARC modern method use

Event immediately prior to starting an episode of non-LARC modern methods (excluding female sterilization), episodes among married women begun in past five years, by country

Country	From Birth, PPA, or LAM	Switched from LARC	Switched from other modern method	Switched from traditional or folkloric method	From non-use	Total	Number of episodes
West Africa							
Burkina Faso 2010	35.7	4.1	1.0	0.2	58.9	100.0	1,002
Liberia 2013	24.7	3.1	0.0	0.0	72.2	100.0	470
Niger 2012	75.0	1.8	0.1	0.4	22.8	100.0	2,760
Nigeria 2013	63.0	1.4	0.8	0.8	34.0	100.0	2,595
Senegal 2014	41.3	4.5	1.1	0.9	52.2	100.0	752
Sierra Leone 2013	36.6	5.4	0.5	0.2	57.2	100.0	903
East and Southern Africa							
Burundi 2010	22.1	12.6	0.4	1.5	63.4	100.0	431
Comoros 2012	31.7	4.6	0.0	1.1	62.7	100.0	262
Rwanda 2010	20.8	17.5	1.5	1.2	58.9	100.0	1,415
Uganda 2011	33.7	12.3	0.8	1.9	51.2	100.0	675
Zambia 2013-14	44.6	6.3	2.7	2.5	43.8	100.0	3,335
Zimbabwe 2010-11	68.4	4.2	3.1	0.5	23.8	100.0	3,764
North Africa and West Asia							
Egypt 2014	62.3	14.6	0.4	0.1	22.5	100.0	6,538
Yemen 2013	43.2	4.7	0.7	1.5	49.9	100.0	7,583
Central Asia							
Kyrgyz Republic 2012	26.1	6.1	2.5	2.3	63.0	100.0	869
Tajikistan 2012	40.5	7.6	2.2	1.5	48.3	100.0	576
South and Southeast Asia							
Bangladesh 2011	23.7	9.6	8.9	1.7	56.1	100.0	8,675
Cambodia 2010	19.7	5.9	1.7	3.8	68.9	100.0	2,800
Indonesia 2012	27.3	46.5	1.9	0.8	23.5	100.0	7,091
Nepal 2011	14.4	8.4	2.4	1.6	73.3	100.0	2,403
Pakistan 2012-13	60.9	4.5	2.2	2.1	30.3	100.0	3,178
TOTAL	**40.0**	**15.3**	**3.8**	**1.3**	**39.6**	**100.0**	**58,079**

Notes: See Table 3.2

Table 3.6. Arrival at traditional/folkloric use

Event immediately prior to starting an episode of traditional or folkloric family planning, episodes among married women begun in past five years, by country

Country	From Birth, PPA, or LAM	Switched from LARC	Switched from other modern method	Switched from traditional or folkloric method	From non-use	Total	Number of episodes
West Africa							
Burkina Faso 2010	38.8	4.4	2.6	0.0	54.2	100.0	219
Liberia 2013	53.3	2.5	0.0	0.0	44.2	100.0	53
Niger 2012	84.2	0.5	3.2	0.0	12.0	100.0	350
Nigeria 2013	66.3	1.1	0.9	0.8	30.9	100.0	2,150
Senegal 2014	48.8	3.2	5.9	1.5	40.6	100.0	159
Sierra Leone 2013	41.1	3.0	0.0	0.0	55.9	100.0	130
East and Southern Africa							
Burundi 2010	30.0	2.6	1.5	0.0	65.9	100.0	382
Comoros 2012	53.4	0.0	3.6	0.4	42.6	100.0	192
Rwanda 2010	24.8	8.8	5.1	0.5	60.8	100.0	654
Uganda 2011	42.6	4.8	3.4	0.6	48.7	100.0	369
Zambia 2013-14	67.3	3.2	4.6	0.4	24.6	100.0	927
Zimbabwe 2010-11	66.9	4.3	11.4	0.0	17.4	100.0	137
North Africa and West Asia							
Egypt 2014	91.6	2.4	2.0	0.0	4.0	100.0	774
Yemen 2013	19.6	6.6	20.1	1.1	52.5	100.0	1,199
Central Asia							
Kyrgyz Republic 2012	20.2	7.2	10.8	1.3	60.5	100.0	209
Tajikistan 2012	42.4	8.0	3.6	0.0	45.9	100.0	164
South and Southeast Asia							
Bangladesh 2011	22.4	11.5	24.5	1.1	40.5	100.0	1,495
Cambodia 2010	39.2	2.7	6.3	0.2	51.7	100.0	1,966
Indonesia 2012	46.6	21.6	13.7	0.9	17.2	100.0	1,357
Nepal 2011	19.1	8.7	7.5	0.3	64.4	100.0	1,040
Pakistan 2012-13	55.4	5.4	6.9	0.1	32.1	100.0	1,714
TOTAL	**48.1**	**7.8**	**9.8**	**0.6**	**33.8**	**100.0**	**15,638**

Notes: See Table 3.2

4. Stopping LARCs

4.1 Discontinuation Rates

Figure 4.1 shows pooled discontinuation rates grouped by reason and method type. These cumulative discontinuation rates represent the proportion of women who discontinue using a method within 12, 24, and 36 months of starting the method across the 21 countries studied, adjusted for population weights. On average, within the first year of use, 9 percent of women discontinue using implants, 15 percent discontinue IUDs, and 32 percent discontinue injectables. While these rates are less than the 40 percent of women who discontinue non-LARC modern methods in the first year, the 12 month discontinuation rate for injectables (32 percent) is on par with the 28 percent of women who discontinue traditional methods within the first year.

By year three, only a minority of women are still using non-LARC modern methods, injectables, and traditional or folkloric methods, as compared to two-thirds of implant users and about half of IUD users who remain with their original method. Interestingly, traditional methods were discontinued less often than both injectables and other modern methods over the course of all periods.

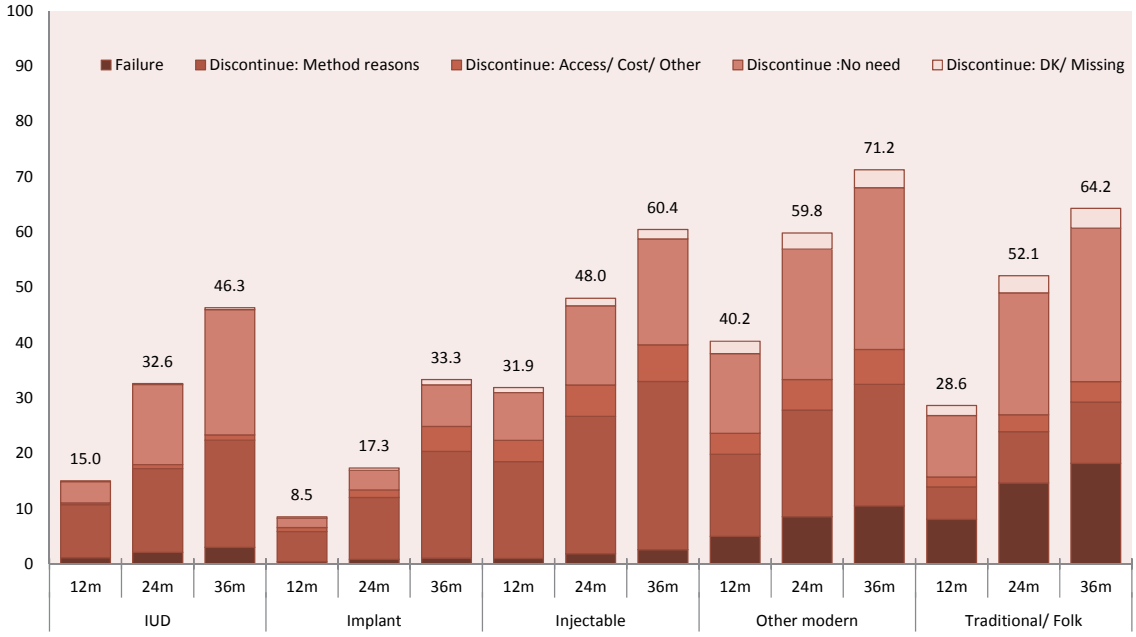
In Figure 4.1, discontinuation rates by reason are indicated by color. The darkest shade reflects method failure with increasingly lighter shades representing other reasons including method-related reasons, such as side effects and health concerns, inconvenience, and desire for a more effective method; cost, access, and other reasons such as lack of availability, husband opposed, and other; and no need, which means that either the woman wanted to become pregnant, had infrequent sex or husband/partner away, became menopausal, was unable to become pregnant, or experienced dissolution of her marriage or union.

The rates of discontinuation due to failure depicted in Figure 4.1 are broadly consistent with existing clinical knowledge about contraceptive efficacy: traditional and folk methods are the most likely to fail, followed by other modern methods. Perhaps surprisingly, IUDs appear to have a failure rate equal to that of injectables and double that of implants. This could reflect data quality issues, such as imperfect recall, or it could suggest problems with training, quality of supplies, provision, counseling, and support that occur ‘on the ground’ in low-income countries.

The finding that IUD and implant discontinuation rates are lowest makes sense. With adequate counseling and provision, it is presumed that women who elect for an IUD or implant intend to use it for a sustained period of time. IUDs and implants are also provider-discontinued methods, whereas injectables and some modern methods can be discontinued passively, require continuous renewal, or are coitus-dependent. One major area of concern in supporting continued use is the frequency with which women discontinue because of method properties, cost and access, since these may indicate inadequate counseling and provision or supply chain failures. Figure 4.1 indicates that discontinuation rates for method-related reasons such as side effects and health concerns are highest for injectables, over 30 percent over the course of three years. Meanwhile, IUDs, implants, and other modern methods have on average around 20 percent discontinuation rate due to method-related reasons by the end of three years. Additionally, cost and access issues for IUDs and implants were cited much less often than method-related reasons. Issues of cost and access, however, appear to be fairly substantial for injectables and other modern methods that require more frequent renewal.

Figure 4.1. 12, 24 and 36-month failure and discontinuation rates by method type: Pooled results

Among married women age 15 to 49 who began using contraception 3 to 62 months preceding the survey, the percentage who experienced failure (pregnancy) or discontinued within the specified interval, by method and reason for discontinuation

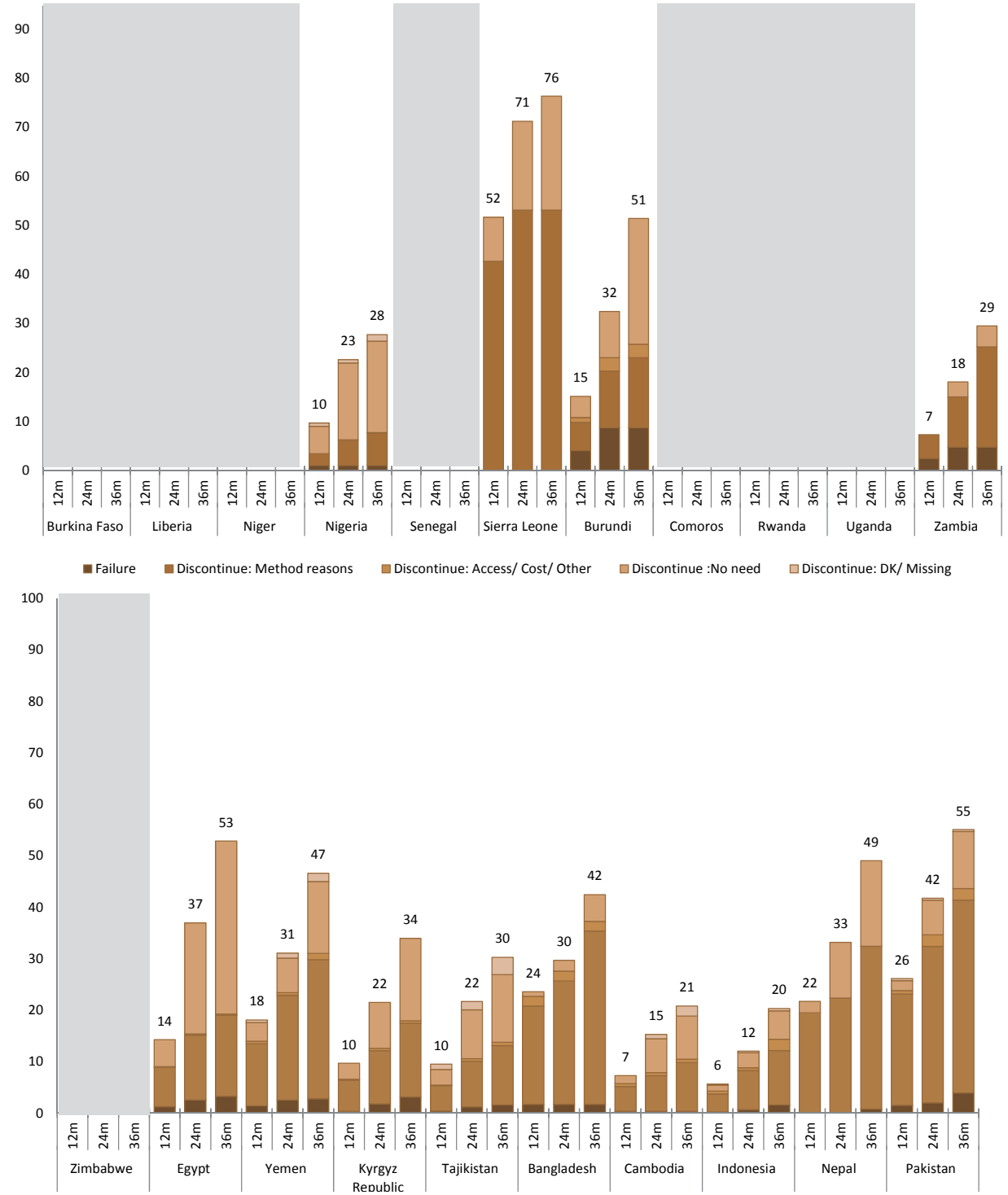


Notes: Pooled results are averaged across all 21 countries, using DHS weights normalized relative to national population size according to United Nations (2010) estimates shown in Table 2.1. Computed among married women 15-49 at time of survey, whose date of first union is at or before the start of episode. Reasons are mutually exclusive. Computations based on multi-decrement life tables from episodes 3 to 62 months prior to the survey. Grey boxes indicate unweighted number of episodes is less than 50, results suppressed. Method reasons include health, side effects, inconvenience, and wanting a more effective method. Cost, access, and other reasons include lack of availability, husband opposed, and other. No need means that the woman wanted to become pregnant, she became menopausal or unable to become pregnant, infrequent sex or husband/partner away, or her marriage or union dissolved.

Figure 4.2 shows cumulative IUD discontinuation rates disaggregated by reason and by country for 12, 24, and 36 month periods. In seven countries, all in sub-Saharan Africa, there was insufficient sample size to estimate discontinuation rates. In the remaining countries, we see that IUD discontinuation ranges from 20 percent at the end of three years in Indonesia to 76 percent in Sierra Leone. Method failure is a substantial factor in Burundi, Zambia, and Pakistan, but almost imperceptible in Cambodia, Indonesia, and Nepal. Access and/or cost were not frequently cited as primary reasons for discontinuation in any country.

Figure 4.2. 12, 24 and 36-month failure and discontinuation rates, IUDs

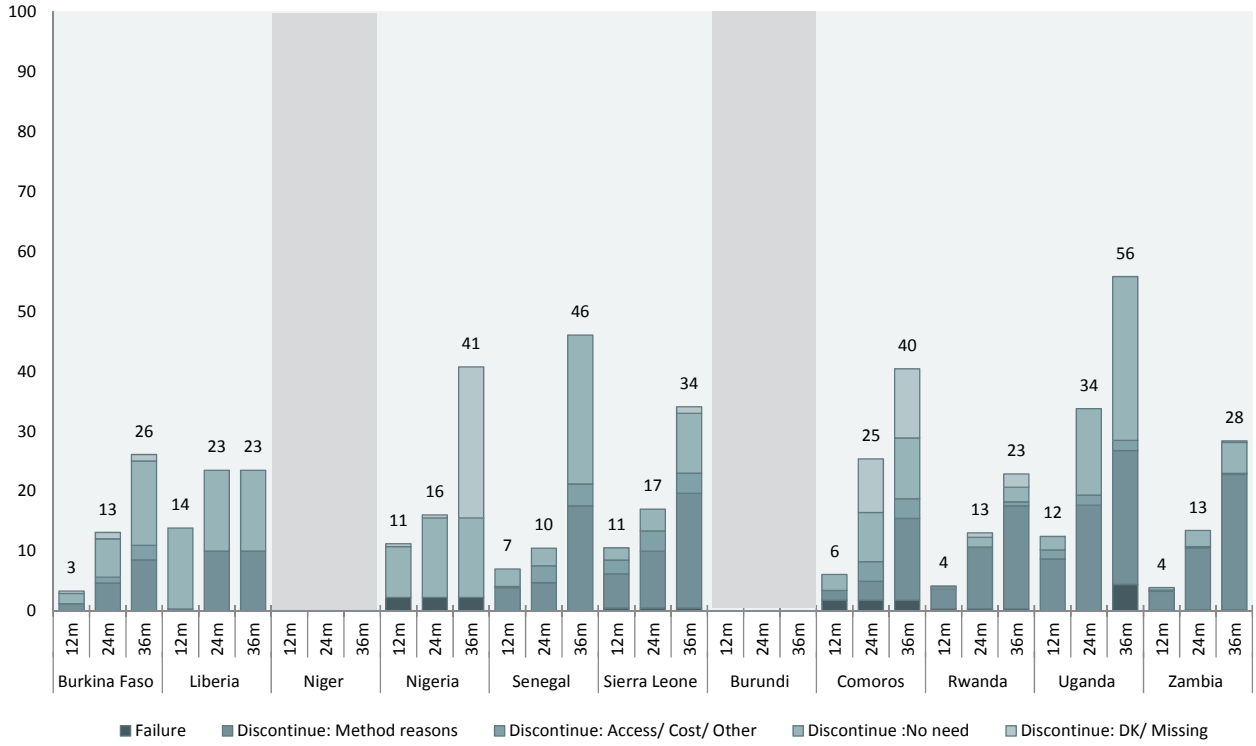
Among married women age 15 to 49 who began using IUDs 3 to 62 months preceding the survey, the percentage who experienced failure (pregnancy) or who discontinued within the specified interval, by country and reason for discontinuation

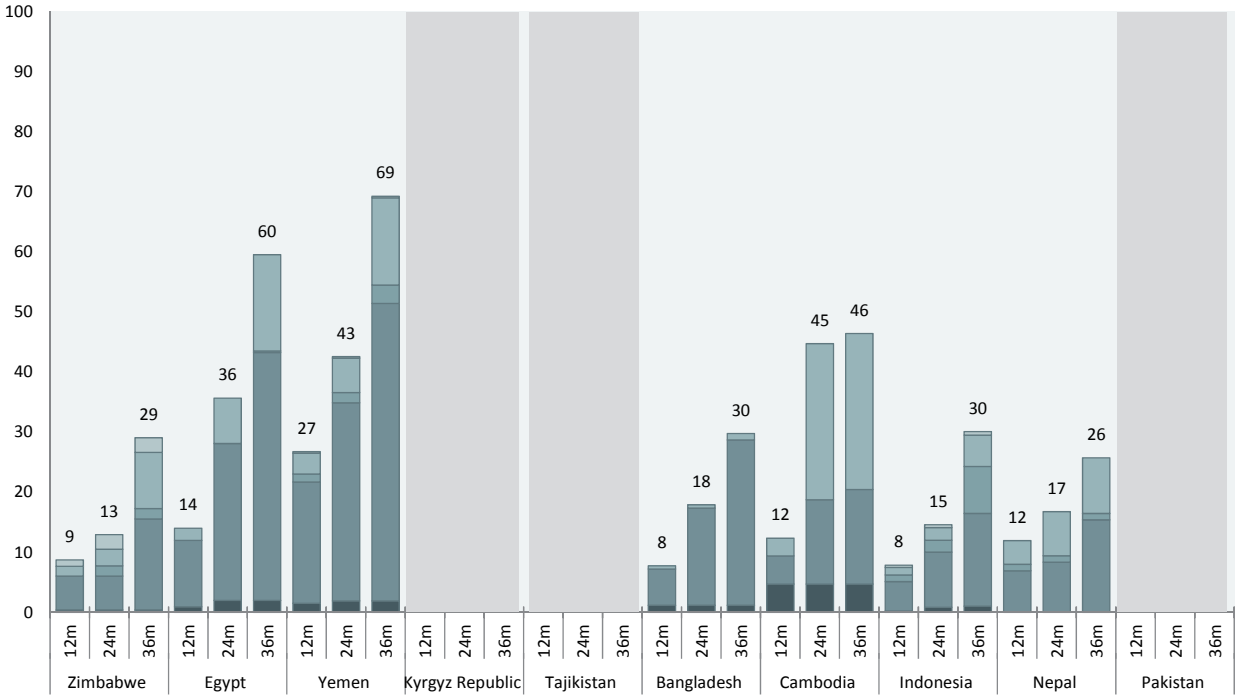


Notes: Grey boxes indicate unweighted number of episodes is less than 50, results suppressed. Results computed among married women 15-49 at time of survey, whose date of first union is at or before the start of episode. Reasons are mutually exclusive. Computations based on multi-decrement life tables from episodes 3 to 62 months prior to the survey. Method reasons include side effects and health concerns, inconvenience, and wanting a more effective method. Cost, access, and other reasons include lack of availability, husband opposed, and other. No need means that the woman wanted to become pregnant, she became menopausal or unable to become pregnant, infrequent sex or husband/partner away, or her marriage or union dissolved.

Figure 4.3. 12, 24 and 36-month failure and discontinuation rates, implants

Among married women age 15 to 49 who began using implants 3 to 62 months preceding the survey, the percentage who experienced failure (pregnancy) or discontinued within the specified interval, by country and reason for discontinuation

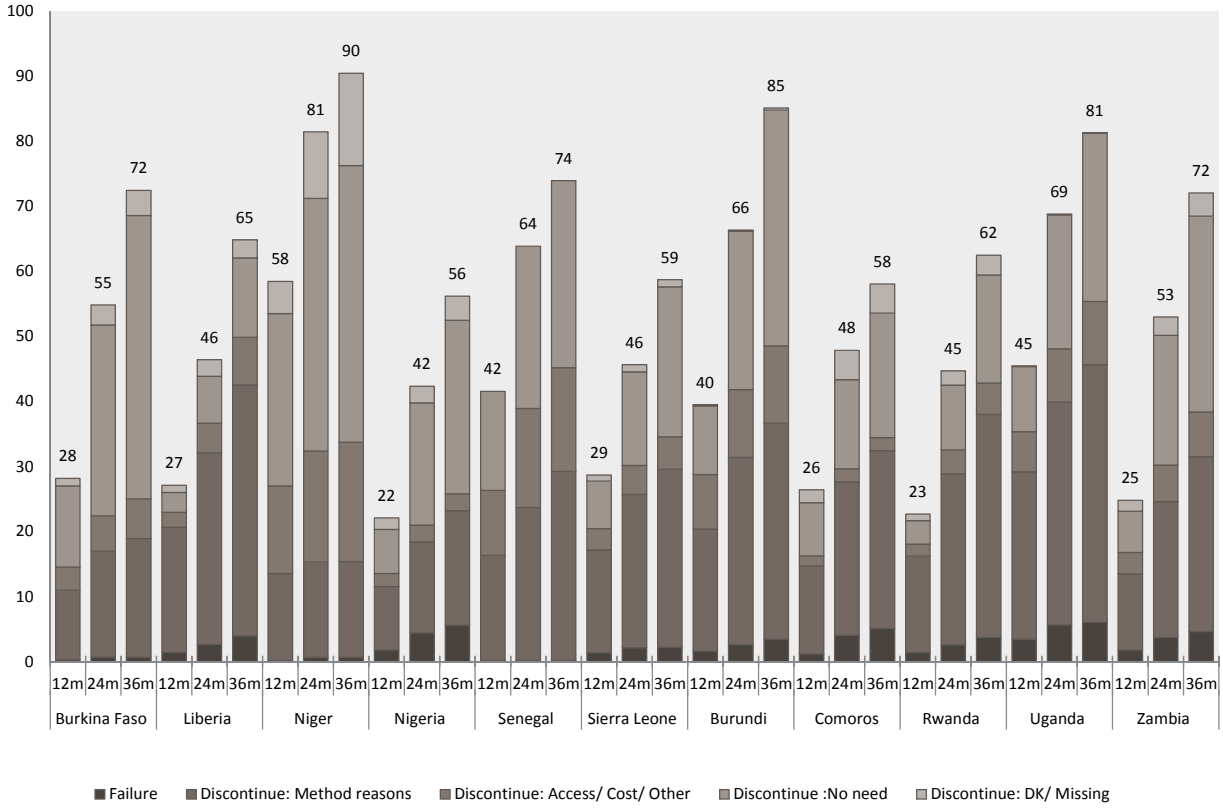


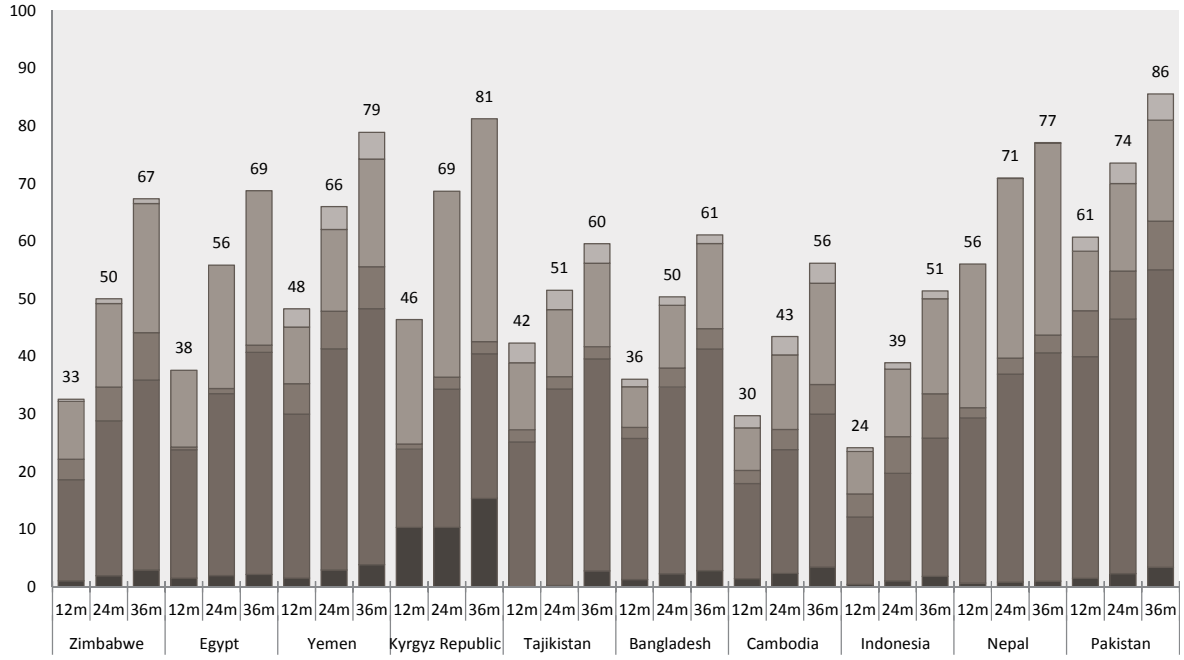


Notes: See Figure 4.2.

Figure 4.4. 12, 24 and 36-month failure and discontinuation rates, injectables

Among married women age 15 to 49 who began using injectables 3 to 62 months preceding the survey, the percentage who experienced failure (pregnancy) or discontinued within the specified interval, by country and reason for discontinuation

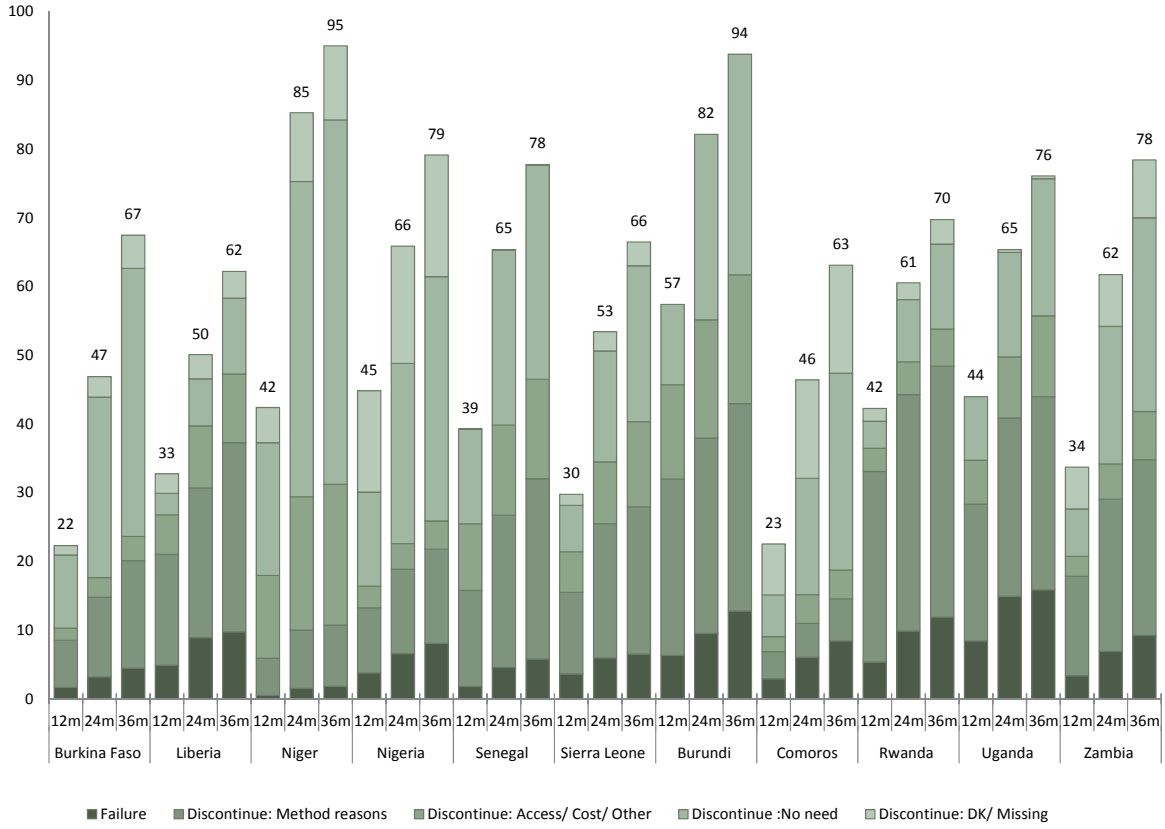


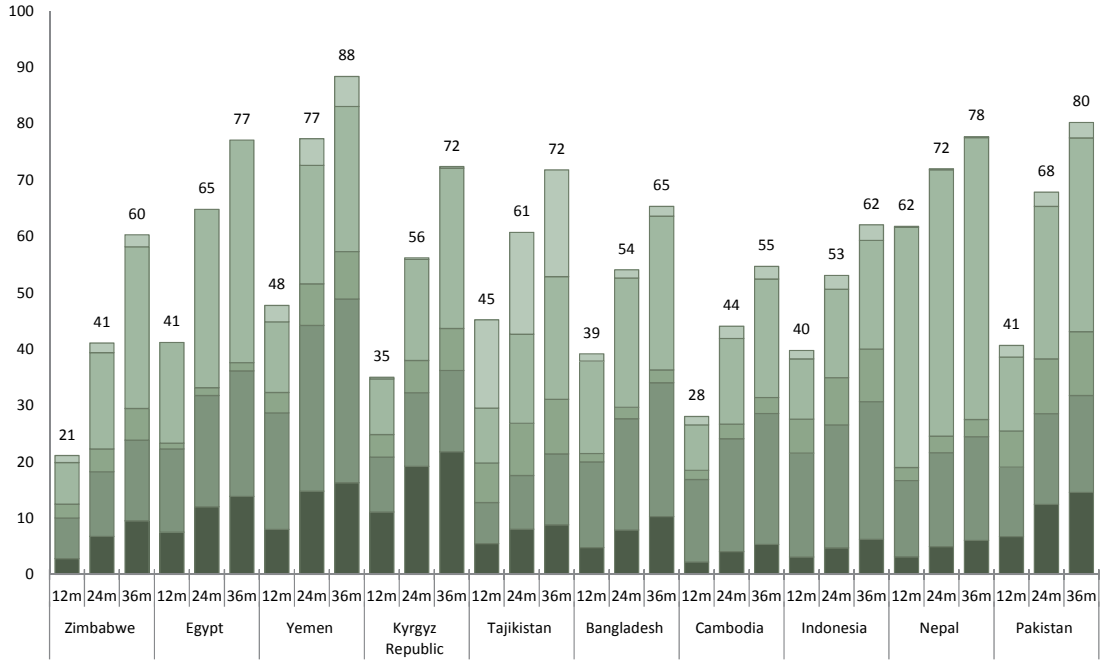


Notes: See Figure 4.2.

Figure 4.5. 12, 24 and 36-month failure and discontinuation rates, non-LARC modern methods, excluding female sterilization

Among married women age 15 to 49 who began using non-LARC modern methods (excluding female sterilization) 3 to 62 months preceding the survey, the percentage who experienced failure (pregnancy) or discontinued within the specified interval, by country and reason for discontinuation

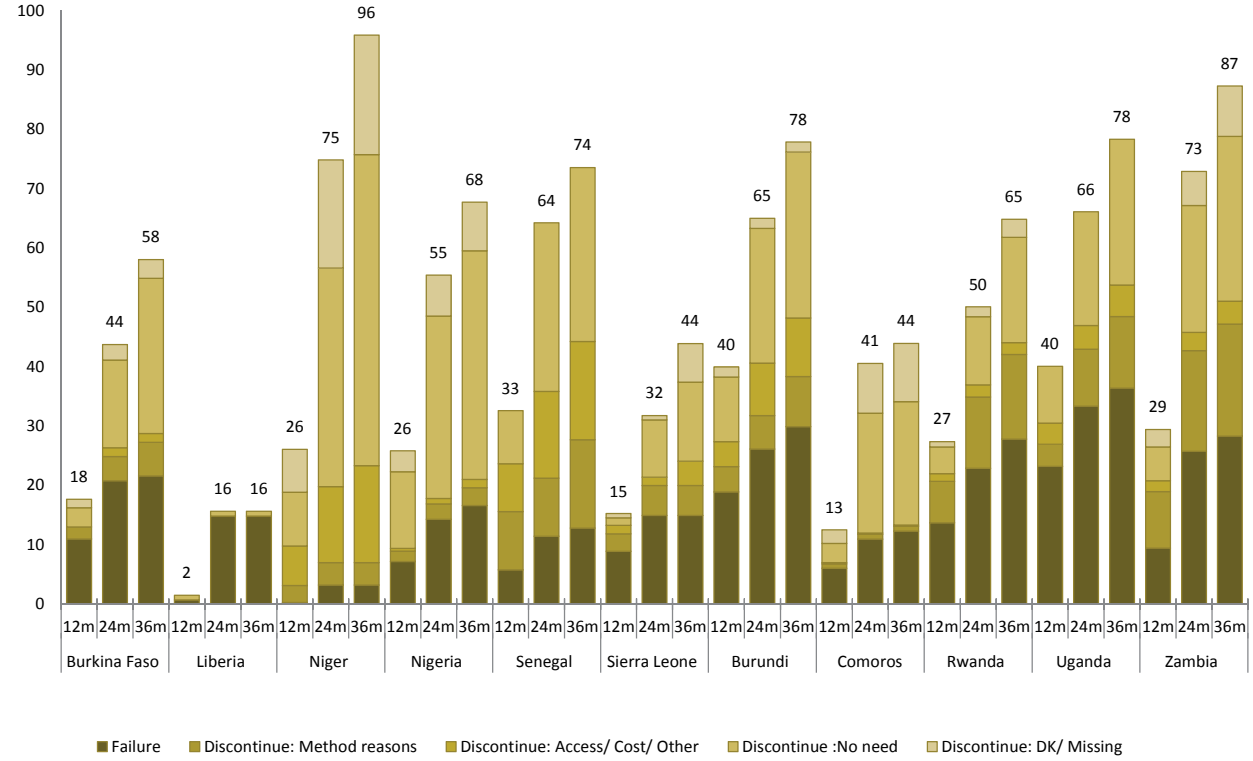


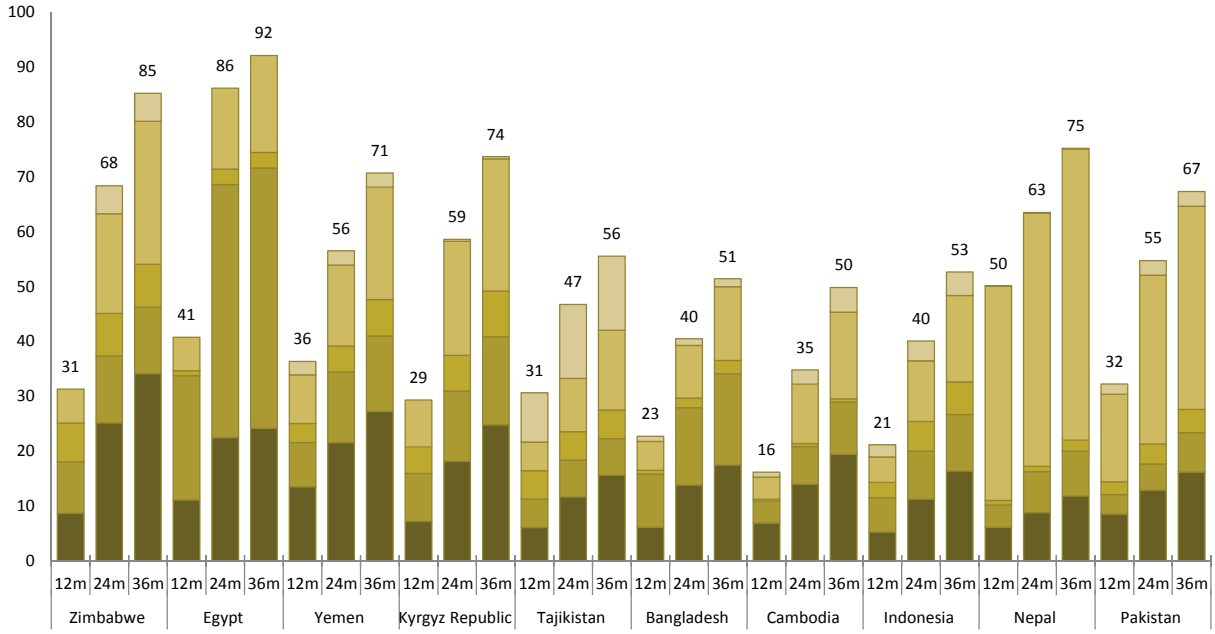


Notes: See Figure 4.2.

Figure 4.6. 12, 24 and 36-month failure and discontinuation rates, traditional and folkloric methods

Among married women age 15 to 49 who began using traditional or folkloric methods 3 to 62 months preceding the survey, the percentage who experienced failure (pregnancy) or discontinued within the specified interval, by country and reason for discontinuation





Notes: See Figure 4.2.

Discontinuation rates for implants are shown in Figure 4.3. At the end of three years, the probability of discontinuation ranges from 23 percent in Liberia to 69 percent in Yemen. In Yemen, method-related reasons such as side effects and health concerns largely drive the high discontinuation rate. Failure rates are highest in Nigeria, Comoros, Uganda, and Cambodia and lowest in most remaining countries in sub-Saharan Africa as well as in Nepal. Again, access and cost were relatively uncommon reasons for discontinuation compared to other reasons.

Injectables are the only LARC that do not require provider removal; as might be expected, injectables have the highest discontinuation rates of the three LARC methods. Injectable discontinuation rates by country, as shown in Figure 4.4, reflect higher rates than IUDs and implants, but also show more diverse reasons for discontinuation than injectables. For the first time, cost, access, and opposition are a non-negligible share of discontinuation rates of a method. This is found most prominently in Niger and Senegal but also in Burundi, Pakistan and Zimbabwe, although less frequently in the North Africa and Asian countries (except Pakistan) as compared to sub-Saharan countries. In addition, method-related reasons were a substantial cause of discontinuation in Pakistan, Yemen, Bangladesh, Egypt, Tajikistan, and most of sub-Saharan Africa (particularly Uganda, Rwanda, Burundi, Senegal, Liberia, and Zimbabwe).

The one year discontinuation rate for non-LARC modern methods (Figure 4.5) ranges from 21 percent in Zimbabwe to 62 percent in Nepal; by three years the rate reaches 88 percent in Yemen, 94 percent in Burundi, and 95 percent in Niger. Method-related causes of discontinuation were considerable in Pakistan and Yemen. Discontinuation rates due to failure are an important source of discontinuation in Kyrgyz Republic and in Pakistan, Yemen, Egypt, Uganda and Burundi. Access and cost issues were also more frequently cited as a reason for discontinuation in sub-Saharan Africa compared to Asia and North Africa.

Figure 4.6 shows the discontinuation rates by reason for traditional/folkloric methods. The 36-month discontinuation rate spans a wide range from 16 percent in Liberia to 96 percent in Nigeria. As expected, the failure rate is high; traditional/folkloric methods are least effective. The failure rate is highest in Uganda, Burundi, Zambia, and Zimbabwe. Discontinuation rates for method-related reasons and for access/cost/other reasons are also low. Discontinuation due to no need is high among traditional method users in Niger, Nigeria, Senegal, Burundi, Nepal, and Pakistan; it may be that women who use traditional methods in these countries intend to use them for the short-term to space pregnancies. However, results should be interpreted with caution due to the underreporting of traditional methods in the DHS calendar (Bradley, Winfrey, and Croft 2015).

4.2 Reasons for discontinuation

The discontinuation rates computed in section 4.1 were standardized for the duration of the specified time interval and computed among episodes begun in the 3 to 62 months prior to the survey regardless of whether they ended. Discontinuation reasons, detailed in this section, are based on all intervals discontinued in the past 3 to 62 months, regardless of length or start date. The section provides insight into the detailed reasons for discontinuation by method type. We classify these detailed reasons into two major categories: discontinuation while still in need (DWSIN) and discontinuation due to lack of need (see Chapter 2 for a discussion of this categorization).

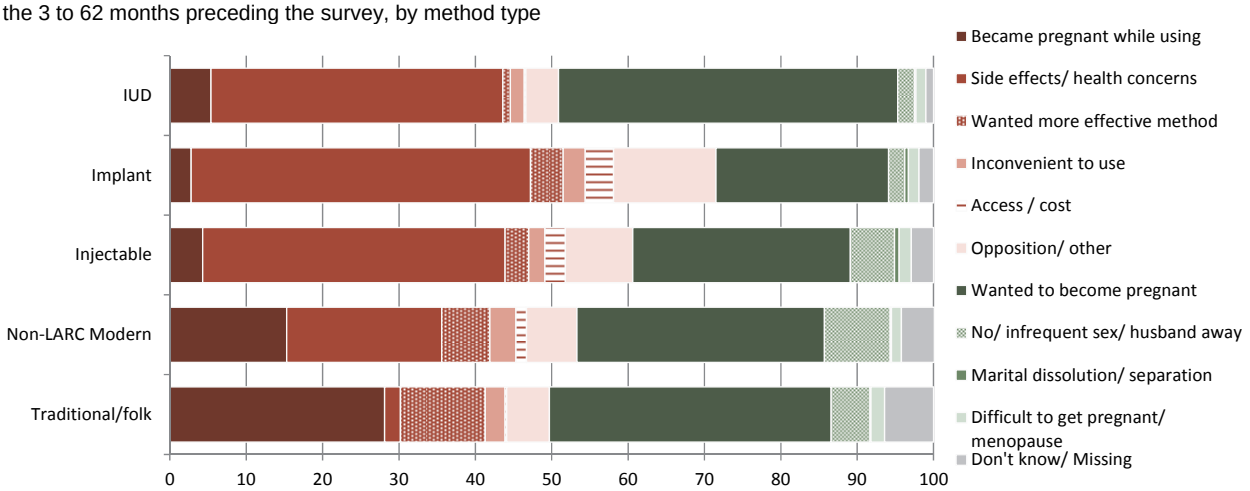
Figure 4.7 highlights differences in the distribution of reasons for discontinuation across the five method types, based on the pooled survey results. In the figure, reasons for discontinuations for women who were still in need of contraception are shaded in red and pink, while reasons for women no longer in need are in green. The share of discontinuations to women still in need of contraception ranges from 50 percent for traditional/folk method to over 70 percent for implant discontinuations.

Across all modern method types, there are two reasons given for the majority of discontinuations: interest in becoming pregnant, and side effects/health concerns. The percentage of women who discontinued because they wanted to become pregnant is highest for IUD discontinuations and lowest for implant discontinuations, although the differences across method types are not very large. In contrast, the percentage of discontinuations for which side effects/health concerns were given as the reason is markedly lower for non-LARC modern methods than for LARC methods and is lowest for traditional or folk methods.

The share of discontinuations due to method failure is lowest for IUD, implants, and injectables; higher for non-LARC modern methods; and highest for traditional/folk methods (at nearly 30 percent). In comparisons of reasons for discontinuation across the method types, desire for a more effective method is most common among traditional or folk method discontinuations and lowest among IUD discontinuations.

Figure 4.7. Reasons for discontinuation: Pooled results

Distribution of the main reason for discontinuation, episodes of contraceptive use among married women age 15-49 discontinued in the 3 to 62 months preceding the survey, by method type



Notes: Pooled results are averaged across all 21 countries, using DHS weights normalized relative to national population size according to United Nations (2010) estimates shown in Table 2.1. Episodes among currently married women age 15 to 49 whose date of first marriage or union was before the date the episode started.

Tables 4.1-4.5 show the distribution of the reason for discontinuation for each method separately by country. Table 4.1 shows this distribution among IUD discontinuations that occurred among married women in the 3 to 62 months prior to interview. In the pooled sample, just over half of IUD discontinuation episodes were to women still in need of contraception. Among women still in need, the most frequent reason for discontinuing was side effects or health concerns (38 percent in the pooled sample). This percentage ranged widely across countries, from 16 percent in Burundi to over 60 percent in Pakistan and Bangladesh. Becoming pregnant while using FP was the second most common reason for women still in need; this reason was given for 5 percent of IUD discontinuations in the pooled sample, and ranged from 1 percent in Nepal and Cambodia to 14 percent in Burundi (note the small sample size in that country). In the pooled sample, only a small percentage of IUD discontinuations were due to wanting a more effective method, inconvenience, access or cost, or opposition or other reasons (under 5 percent for each reason). However, in Burundi and Cambodia, inconvenience was given as a reason for 18 percent and 12 percent, respectively, of discontinuations.

For the other half of IUD discontinuations, women stopped using an IUD because they were no longer in need of contraception. In the pooled sample, 44 percent of discontinuation episodes were a result of

women wanting to become pregnant. This percentage ranged from just 5 percent in Nepal to 60 percent in Nigeria. An additional three percent of IUD discontinuations in the pooled sample were due to either no or infrequent sex, the husband being away (2 percent) or menopause/difficulty getting pregnant (1 percent). Nepal had the highest percentage of IUD discontinuations due to no or infrequent sex or the husband being away (25 percent).

Because of the small number of cases of IUD discontinuations in most of West, East, and Southern Africa, we were not able to examine the reasons for discontinuations in these regions.

Table 4.1. Reasons for discontinuing IUDs

Distribution of the main reason for discontinuation, IUD episodes among married women age 15-49 discontinued in the 3 to 62 months preceding the survey, by country

	Still in need[1]						Not in need						
	Became pregnant while using	Side effects/ health concerns	Wanted more effective method	Inconvenient to use	Access/ cost	Opposition/ other	Wanted to become pregnant	No/ infrequent sex/ husband away	Marital dissolution/ separation	Difficult to get pregnant/ menopause	Don't know/ Missing	Total	Number of episodes
West Africa													
Burkina Faso 2010	*	*	*	*	*	*	*	*	*	*	*		18
Liberia 2013	*	*	*	*	*	*	*	*	*	*	*		2
Niger 2012	*	*	*	*	*	*	*	*	*	*	*		13
Nigeria 2013	4.3	23.4	0.0	1.9	1.6	2.1	60.1	0.7	0.0	1.4	4.6	100.0	124
Senegal 2014	*	*	*	*	*	*	*	*	*	*	*		9
Sierra Leone 2013	*	*	*	*	*	*	*	*	*	*	*		21
East and Southern Africa													
Burundi 2010	14.0	15.8	0.0	17.6	0.0	12.3	40.3	0.0	0.0	0.0	0.0	100.0	(34)
Comoros 2012	*	*	*	*	*	*	*	*	*	*	*		2
Rwanda 2010	*	*	*	*	*	*	*	*	*	*	*		9
Uganda 2011	*	*	*	*	*	*	*	*	*	*	*		16
Zambia 2013-14	12.5	57.5	6.7	0.0	0.0	2.5	20.8	0.0	0.0	0.0	0.0	100.0	(38)
Zimbabwe 2010-11	*	*	*	*	*	*	*	*	*	*	*		9
North Africa and West Asia													
Egypt 2014	6.3	32.4	0.1	0.6	0.0	0.7	56.5	2.1	0.3	0.9	0.0	100.0	4,766
Yemen 2013	5.0	50.5	1.9	3.0	0.1	2.6	28.6	3.7	0.1	0.5	4.1	100.0	781
Central Asia													
Kyrgyz Republic 2012	7.0	33.5	2.0	1.5	0.0	3.4	49.0	2.3	0.0	1.4	0.0	100.0	628
Tajikistan 2012	4.5	28.1	1.8	8.9	0.2	3.3	34.6	5.2	0.3	0.9	12.1	100.0	461
South and Southeast Asia													
Bangladesh 2011	2.5	66.0	4.8	1.2	0.4	7.6	12.3	0.0	0.0	3.2	1.9	100.0	80
Cambodia 2010	0.9	24.4	2.5	12.2	3.9	6.6	34.1	3.9	0.1	0.3	11.1	100.0	89
Indonesia 2012	4.4	29.0	4.0	5.1	0.9	19.9	30.8	1.2	0.1	2.4	2.3	100.0	552
Nepal 2011	0.5	58.5	3.1	6.7	0.0	1.6	5.0	24.6	0.0	0.0	0.0	100.0	53
Pakistan 2012-13	3.7	63.0	0.9	2.1	0.4	5.6	18.7	2.8	0.0	1.8	0.9	100.0	400
TOTAL[2]	**5.4**	**38.2**	**1.0**	**1.8**	**0.2**	**4.3**	**44.4**	**2.2**	**0.2**	**1.3**	**1.0**	**100.0**	**8,102**

Notes: Episodes among currently married women age 15 to 49 whose date of first marriage or union was before the date the episode started.
Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.
[1] 'Still in need' does not necessarily refer to unmet need. See chapter 2 for additional discussion of this distinction.
[2] Pooled average across all 21 countries, using DHS weights normalized relative to national population size according to United Nations (2010) estimates shown in Table 2.1.

Table 4.2 shows the distribution of reasons for discontinuing the use of an implant, among all implant discontinuations that occurred among married women in the 3 to 62 months before the interview. Overall in the pooled sample, more than 70 percent of these discontinuations were among women still in need of contraception. Side effects/health concerns was the most common reason given for discontinuing implants (44 percent in the pooled sample), ranging from 19 percent in Cambodia to 66 percent in Bangladesh. Overall, opposition or other reasons were given for 13 percent of implant discontinuations; this reason

was particularly high in South and Southeast Asia, and specifically in Cambodia (19 percent), Indonesia (20 percent), and Nepal (17 percent).

The remaining 10 percent of implant discontinuations among women still in need was due to becoming pregnant while using (3 percent), wanting a more effective method (4 percent), and access or cost (4 percent). Wanting a more effective method was especially common in Bangladesh (9 percent), and access or cost was especially common in Zimbabwe (8 percent).

Among women who no longer needed a method, wanting to become pregnant was the most common reason given for discontinuing use of an implant. This reason was given for 23 percent of implant discontinuations in the pooled sample, with ranges from 11 percent in Rwanda and Bangladesh to 50 percent in Burkina Faso. All other reasons were given for less than 5 percent of discontinuations in the pooled sample and in every country, except that no or infrequent sex or husband being away was provided as a reason for 13 percent of implant discontinuations in Nepal.

Table 4.2. Reasons for discontinuing implants

Distribution of the main reason for discontinuation, implant episodes among married women age 15-49 discontinued in the 3 to 62 months preceding the survey, by country

	Still in need						No further need						
	Became pregnant while using	Side effects/ health concerns	Wanted more effective method	Inconvenient to use	Access/ cost	Opposition/ other	Wanted to become pregnant	No/ infrequent sex/ husband away	Marital dissolution/ separation	Difficult to get pregnant/ menopause	Don't know/ Missing	Total	Number of episodes
West Africa													
Burkina Faso 2010	0.9	23.4	5.1	0.7	0.9	9.8	49.7	1.4	0.6	0.0	7.5	100.0	163
Liberia 2013	*	*	*	*	*	*	*	*	*	*	*		10
Niger 2012	*	*	*	*	*	*	*	*	*	*	*		8
Nigeria 2013	*	*	*	*	*	*	*	*	*	*	*		12
Senegal 2014	10.7	30.0	1.6	6.6	0.0	14.1	33.6	0.0	0.0	3.4	0.0	100.0	58
Sierra Leone 2013	2.0	58.2	0.9	0.7	3.2	9.2	23.6	0.0	0.0	0.0	2.2	100.0	67
East and Southern Africa													
Burundi 2010	*	*	*	*	*	*	*	*	*	*	*		4
Comoros 2012	*	*	*	*	*	*	*	*	*	*	*		20
Rwanda 2010	2.0	66.2	5.0	1.3	0.0	3.1	10.6	1.7	0.0	0.0	10.2	100.0	70
Uganda 2011	5.0	47.6	0.0	0.0	2.7	4.3	37.7	0.0	1.8	1.0	0.0	100.0	47
Zambia 2013-14	2.4	60.5	1.6	0.0	0.0	2.7	30.2	0.0	0.0	0.2	2.6	100.0	177
Zimbabwe 2010-11	7.0	38.1	1.4	0.0	8.2	6.8	31.7	2.3	0.0	0.0	4.6	100.0	47
North Africa and West Asia													
Egypt 2014	2.3	58.7	3.1	4.6	3.1	1.2	20.5	4.4	0.1	2.0	0.0	100.0	150
Yemen 2013	2.2	63.5	1.7	9.9	1.9	1.1	16.8	1.9	0.0	0.0	1.0	100.0	120
Central Asia													
Kyrgyz Republic 2012	*	*	*	*	*	*	*	*	*	*	*		0
Tajikistan 2012	*	*	*	*	*	*	*	*	*	*	*		1
South and Southeast Asia													
Bangladesh 2011	1.4	66.1	8.6	0.9	3.5	2.9	10.7	2.9	0.0	2.8	0.3	100.0	108
Cambodia 2010	9.1	19.0	2.3	5.7	0.0	19.3	31.2	4.6	0.0	8.8	0.0	100.0	25
Indonesia 2012	2.8	37.0	4.2	3.5	4.5	19.8	22.7	1.7	0.7	1.2	1.8	100.0	654
Nepal 2011	0.0	40.9	5.8	3.3	1.7	16.7	15.8	12.9	0.0	2.9	0.0	100.0	49
Pakistan 2012-13	*	*	*	*	*	*	*	*	*	*	*		10
TOTAL	**2.8**	**44.4**	**4.3**	**2.9**	**3.7**	**13.4**	**22.6**	**2.1**	**0.5**	**1.4**	**1.9**	**100.0**	**1,799**

Notes: See Table 4.1.

The distribution of reasons given for discontinuing use of injectables is similar to those described above for implants, as Table 4.3 shows. Across all countries in the pooled sample, 61 percent of injectable discontinuations were to women still in need of a method. Among reasons that indicate that the woman is still in need, side effects or health concerns is the most common reason given (40 percent), followed by

opposition or other reasons (9 percent), becoming pregnant while using (4 percent), access or cost (3 percent), and inconvenience (2 percent). Two countries are noteworthy for distinct distributions of reasons: in Tajikistan, a relatively large percentage of discontinuations are due to inconvenience of use (21 percent), and in Kyrgyz Republic a relatively high percentage of discontinuations are due to becoming pregnant while using (15 percent).

For the remaining 39 percent of injectable discontinuations, the woman was no longer in need.

Overall in the pooled sample, 29 percent of injectable discontinuations were due to wanting to become pregnant; this ranged from 10 percent in Nepal to 54 percent in Burkina Faso. Also in the pooled sample, 6 percent of injectable discontinuations were due to no or infrequent sex or the husband being away, although this percentage varied widely across countries. While in 13 countries the percentage was under 5 percent, in Kyrgyz Republic, Tajikistan, and Nepal, this reason was given for 21 percent, 15 percent, and 31 percent of injectable discontinuations, respectively. Marital dissolution and menopause/difficult getting pregnant were infrequent reasons (under 3 percent) in all countries, except that in Bangladesh and Cambodia, 6 percent and 4 percent of injectable discontinuations were due to menopause or difficulty getting pregnant. Finally, in two countries, Niger and Tajikistan, information on reasons was either unknown or missing for more than 10 percent of injectable discontinuations.

Table 4.3. Reasons for discontinuing injectables

Distribution of the main reason for discontinuation, injectable episodes among married women age 15-49 discontinued in the 3 to 62 months preceding the survey, by country

	Still in need						No further need						
	Became pregnant while using	Side effects/ health conc-erns	Wanted more effective method	Inconve nient to use	Access/ cost	Oppositi on/ other	Wanted to become preg-nant	No/ infre-quent sex/ husband away	Marital dis-solution/ separa-tion	Difficult to get preg-nant/ menopa use	Don't know/ Missing	Total	Number of episodes
West Africa													
Burkina Faso 2010	1.0	24.2	2.8	0.8	5.3	3.2	53.8	2.7	0.1	0.4	5.5	100.0	725
Liberia 2013	6.0	54.4	2.9	0.9	6.2	4.1	19.6	1.3	0.0	0.4	4.1	100.0	382
Niger 2012	0.5	11.6	5.0	0.5	6.7	11.6	42.6	8.0	0.3	0.2	13.0	100.0	403
Nigeria 2013	10.3	26.7	1.9	1.2	0.8	3.7	45.4	2.5	0.2	0.1	7.3	100.0	673
Senegal 2014	1.7	34.5	2.4	0.9	1.1	19.0	33.2	6.6	0.4	0.0	0.0	100.0	506
Sierra Leone 2013	4.3	45.2	4.1	1.1	3.2	5.4	32.0	1.7	0.6	0.3	2.1	100.0	516
East and Southern Africa													
Burundi 2010	4.5	34.2	2.8	4.0	4.1	10.0	35.8	2.1	1.0	1.2	0.3	100.0	637
Comoros 2012	7.0	37.2	2.5	0.8	2.6	1.9	37.5	1.2	1.6	0.0	7.6	100.0	157
Rwanda 2010	5.4	45.1	9.2	1.7	1.0	6.8	22.8	2.8	0.1	0.3	4.8	100.0	1,320
Uganda 2011	7.6	47.3	1.6	1.9	3.1	7.7	28.1	1.7	0.6	0.2	0.2	100.0	1,143
Zambia 2013-14	6.6	31.4	2.9	0.8	3.9	5.7	41.2	1.2	0.3	0.3	5.6	100.0	1,778
Zimbabwe 2010-11	6.1	33.7	5.3	3.2	7.6	2.5	36.5	2.8	0.3	0.5	1.6	100.0	582
North Africa and West Asia													
Egypt 2014	3.9	52.5	1.0	1.0	0.2	1.6	28.3	9.9	0.3	1.4	0.0	100.0	2,236
Yemen 2013	4.9	48.9	2.7	4.3	3.0	6.0	15.7	8.6	0.0	0.1	5.8	100.0	1,122
Central Asia													
Kyrgyz Republic 2012	14.5	28.6	7.4	1.6	1.8	0.0	22.2	21.1	0.0	0.9	1.9	100.0	42
Tajikistan 2012	3.1	26.3	4.1	20.6	2.9	1.4	13.2	14.6	0.0	0.4	13.5	100.0	112
South and Southeast Asia													
Bangladesh 2011	5.4	52.8	2.2	1.8	4.7	1.5	18.5	4.6	0.2	5.6	2.8	100.0	2,010
Cambodia 2010	6.6	36.5	2.8	9.1	4.2	2.8	26.2	2.8	0.0	3.5	5.5	100.0	869
Indonesia 2012	3.5	32.8	3.7	2.5	2.2	12.9	32.1	5.4	1.0	1.2	2.8	100.0	10,264
Nepal 2011	1.5	47.3	4.0	0.2	0.9	3.3	10.4	31.4	0.1	0.6	0.1	100.0	1,568
Pakistan 2012-13	4.1	53.7	2.6	1.0	4.3	5.9	18.7	3.1	0.0	0.9	5.6	100.0	801
TOTAL	**4.3**	**39.6**	**3.1**	**2.1**	**2.7**	**8.8**	**28.5**	**5.8**	**0.6**	**1.6**	**2.9**	**100.0**	**27,844**

Notes: See Table 4.1.

Table 4.4 shows the distribution of reasons for discontinuing non-LARC modern family planning methods. Across all countries in the pooled sample, 53 percent of these discontinuations are among women still in need of a method. Among reasons that indicate the woman is still in need, side effects/health concerns was the most common reason given (20 percent). Looking across the countries, side effects/health concerns ranged from under 5 percent in Niger, Nigeria, and Tajikistan, to over 30 percent in Liberia and Rwanda. Compared with the three LARC methods, a higher percentage of non-LARC discontinuation episodes were due to the respondent becoming pregnant while using (15 percent). This percentage was particularly high in Kyrgyz Republic, where becoming pregnant while using was given as a reason for nearly one third of these discontinuations (32 percent). Wanting a more effective method was given as a reason for 6 percent of non-LARC discontinuations in the pooled sample; this ranges from 2 percent in Liberia to 15 percent in Rwanda. Access or cost was given as a reason for just 1 percent of discontinuations in the pooled sample; the share is under 5 percent in all countries. Opposition or other reasons were given for 7 percent of non-LARC modern FP discontinuations, and this percentage ranges from 2 percent in both Bangladesh and Egypt to 16 percent in Burundi.

Table 4.4. Reasons for discontinuing non-LARC modern methods

Distribution of the main reason for discontinuation, non-LARC modern method episodes (excluding female sterilization) among married women age 15-49 discontinued in the 3 to 62 months preceding the survey, by country

	Still in need						No further need						
	Became pregnant while using	Side effects/ health conc-erns	Wanted more effective method	Inconve nient to use	Access/ cost	Oppositi on/ other	Wanted to become preg-nant	No/ infre-quent sex/ husband away	Marital dis-solution/ separa-tion	Difficult to get preg-nant/ menopa use	Don't know/ Missing	Total	Number of episodes
West Africa													
Burkina Faso 2010	6.0	14.3	5.0	2.4	2.1	3.7	51.0	7.8	1.8	0.5	5.4	100.0	610
Liberia 2013	16.0	31.1	2.2	9.8	3.8	10.7	19.5	0.6	0.0	0.0	6.3	100.0	251
Niger 2012	1.7	3.2	5.8	0.2	1.7	20.1	45.7	9.6	0.2	0.5	11.2	100.0	2,104
Nigeria 2013	11.1	4.0	9.6	2.9	1.0	4.1	40.6	2.7	0.2	0.2	23.6	100.0	1,694
Senegal 2014	7.5	26.9	5.4	0.5	1.1	15.6	30.3	11.7	1.0	0.0	0.1	100.0	506
Sierra Leone 2013	9.8	21.2	13.8	1.9	4.4	11.9	27.5	3.0	0.0	0.1	6.6	100.0	481
East and Southern Africa													
Burundi 2010	11.2	17.7	6.1	13.9	3.7	15.9	30.3	1.0	0.0	0.2	0.0	100.0	280
Comoros 2012	11.3	8.1	2.9	0.7	3.2	2.6	42.2	2.9	0.0	0.0	26.2	100.0	120
Rwanda 2010	15.6	30.6	15.3	8.4	0.7	7.2	15.5	1.3	0.4	0.3	4.7	100.0	769
Uganda 2011	17.7	27.4	2.6	9.0	3.4	11.2	24.1	3.8	0.5	0.1	0.3	100.0	450
Zambia 2013-14	12.6	16.4	10.9	3.1	3.2	5.2	35.5	1.1	0.4	0.2	11.4	100.0	2,684
Zimbabwe 2010-11	13.8	12.6	5.5	3.3	2.7	4.5	49.1	4.6	0.5	0.4	3.0	100.0	2,564
North Africa and West Asia													
Egypt 2014	18.8	22.2	4.8	1.2	0.5	1.4	37.0	13.4	0.1	0.7	0.0	100.0	5,217
Yemen 2013	18.1	21.6	12.5	2.6	3.3	5.2	20.9	9.9	0.1	0.1	5.8	100.0	6,635
Central Asia													
Kyrgyz Republic 2012	32.0	6.4	9.9	4.6	1.4	8.8	32.5	4.0	0.0	0.1	0.3	100.0	613
Tajikistan 2012	13.3	4.8	5.8	6.4	4.1	8.7	21.5	6.3	0.0	1.4	27.6	100.0	400
South and Southeast Asia													
Bangladesh 2011	16.7	25.6	4.5	4.1	1.1	1.8	30.2	11.3	0.1	2.1	2.5	100.0	7,496
Cambodia 2010	8.9	25.3	5.3	10.4	1.2	3.6	38.3	1.7	0.2	0.2	5.0	100.0	1,647
Indonesia 2012	11.7	22.8	7.8	3.5	0.7	13.4	29.9	4.0	0.6	1.3	4.2	100.0	5,495
Nepal 2011	8.2	14.9	6.4	3.1	0.5	3.5	15.1	47.6	0.2	0.3	0.3	100.0	1,803
Pakistan 2012-13	18.5	12.8	6.2	2.9	2.2	11.7	36.6	3.5	0.0	1.6	3.9	100.0	2,495
TOTAL	**15.3**	**20.3**	**6.3**	**3.4**	**1.4**	**6.6**	**32.4**	**8.6**	**0.2**	**1.3**	**4.3**	**100.0**	**44,313**

Notes: See Table 4.1.

Among reasons that indicate that the woman is no longer in need, wanting to become pregnant is the most common reason for discontinuing (32 percent) in the pooled sample; this ranges from 15 percent in Nepal to over 50 percent in Burkina Faso. This is followed by no or infrequent sex or the husband being away (8 percent), which ranges from under 2 percent in five countries to 48 percent in Nepal. Marital dissolution and menopause/difficult getting pregnant are infrequent reasons (under 2 percent) in all countries. For

over 20 percent of non-LARC modern FP discontinuations in Nigeria, Comoros, and Tajikistan, information on the reason is either missing or the respondent did not know the reason.

Table 4.5 shows the distribution of reasons for discontinuing traditional or folkloric family planning methods. Exactly half of these discontinuations were to women still in need of a method. Most common among these reasons is becoming pregnant while using (28 percent in the pooled sample). While in Niger this percentage is just 3 percent, in Burundi, Rwanda, Uganda, and Cambodia, at least 40 percent of traditional/folkloric discontinuations were due to becoming pregnant. For another 11 percent of discontinuations in the pooled sample, wanting a more effective method was given as the reason; for 6 percent, opposition or other reasons were given. Access or cost was provided for less than 1 percent of discontinuations in all countries, and only in Rwanda and Egypt (6 percent and 19 percent, respectively) was inconvenience cited as a reason for more than 5 percent of discontinuation episodes.

Table 4.5. Reasons for discontinuing traditional and folkloric methods

Distribution of the main reason for discontinuation, traditional and folkloric episodes among married women age 15-49 discontinued in the 3 to 62 months preceding the survey, by country

	Still in need						No further need						
	Became pregnant while using	Side effects/ health conc-erns	Wanted more effective method	Inconve nient to use	Access/ cost	Oppositi on/ other	Wanted to become preg-nant	No/ infre-quent sex/ husband away	Marital dis-solution/ separa-tion	Difficult to get preg-nant/ menopa use	Don't know/ Missing	Total	Number of episodes
West Africa													
Burkina Faso 2010	30.8	0.5	7.4	1.0	0.0	1.3	44.3	3.8	0.0	2.8	8.1	100.0	137
Liberia 2013	*	*	*	*	*	*	*	*	*	*	*		29
Niger 2012	2.6	0.0	3.5	0.4	1.0	18.2	48.1	3.3	0.0	0.9	22.1	100.0	237
Nigeria 2013	24.2	0.2	4.5	0.2	0.0	1.8	53.2	2.2	0.1	0.6	13.1	100.0	1,242
Senegal 2014	16.1	8.6	10.7	0.0	0.0	20.8	39.2	4.7	0.0	0.0	0.0	100.0	76
Sierra Leone 2013	31.5	10.9	2.4	4.6	0.8	10.3	30.3	0.0	2.3	0.0	7.0	100.0	56
East and Southern Africa													
Burundi 2010	39.7	0.0	7.2	2.1	0.0	13.2	33.5	1.9	0.0	0.1	2.3	100.0	193
Comoros 2012	21.1	0.6	5.1	0.0	1.0	1.8	43.8	2.1	1.0	0.0	23.5	100.0	86
Rwanda 2010	41.2	0.3	13.1	5.8	0.0	3.8	27.3	1.5	0.3	0.3	6.4	100.0	358
Uganda 2011	47.2	0.2	9.4	1.2	0.0	7.8	31.1	1.5	0.9	0.7	0.0	100.0	280
Zambia 2013-14	32.6	0.0	19.5	1.1	0.0	4.2	31.9	0.6	0.2	0.2	9.6	100.0	774
Zimbabwe 2010-11	33.7	0.9	18.2	0.0	1.6	9.5	26.2	3.5	0.7	0.0	5.7	100.0	103
North Africa and West Asia													
Egypt 2014	26.9	2.9	27.5	19.2	0.1	3.0	18.8	1.4	0.0	0.3	0.0	100.0	552
Yemen 2013	37.5	2.1	14.2	2.4	0.4	7.7	25.3	5.0	0.1	0.2	5.1	100.0	897
Central Asia													
Kyrgyz Republic 2012	30.2	2.8	19.9	1.6	0.0	12.3	29.6	1.9	0.0	1.3	0.5	100.0	137
Tajikistan 2012	28.4	0.0	7.0	1.4	0.0	10.0	20.8	8.9	0.0	0.0	23.6	100.0	113
South and Southeast Asia													
Bangladesh 2011	31.4	2.1	19.6	3.4	0.0	3.5	23.6	3.4	0.2	7.0	5.9	100.0	984
Cambodia 2010	40.8	0.9	13.1	2.8	0.0	1.4	32.4	0.7	0.6	0.0	7.2	100.0	981
Indonesia 2012	26.9	5.4	10.0	2.6	0.2	12.5	31.5	1.5	0.1	1.0	8.3	100.0	888
Nepal 2011	16.3	0.4	10.0	0.7	0.1	2.7	16.1	52.6	0.0	0.8	0.3	100.0	732
Pakistan 2012-13	25.7	2.4	6.3	1.3	0.5	5.8	48.7	4.5	0.0	0.5	4.4	100.0	1,046
TOTAL	**28.1**	**2.1**	**11.1**	**2.6**	**0.2**	**5.6**	**36.9**	**5.1**	**0.1**	**1.8**	**6.4**	**100.0**	**9,900**

Notes: See Table 4.1.

Among reasons that indicate that the woman is no longer in need of contraception, wanting to become pregnant is the most common for discontinuing traditional/folkloric methods (37 percent) in the pooled sample; this percentage ranges from 19 percent in Egypt to 49 percent in Pakistan. No or infrequent sex or the husband being away was given as a reason for 5 percent of discontinuations, and is most prevalent in Nepal (53 percent) and Tajikistan (9 percent). Marital dissolution and menopause/difficult getting pregnant were given for under 3 percent of discontinuations in all countries. In three countries, Niger,

Comoros, and Tajikistan, information on the reason is missing or was not known by the respondent for more than 20 percent of traditional/folkloric discontinuations.

4.3 Status after discontinuation

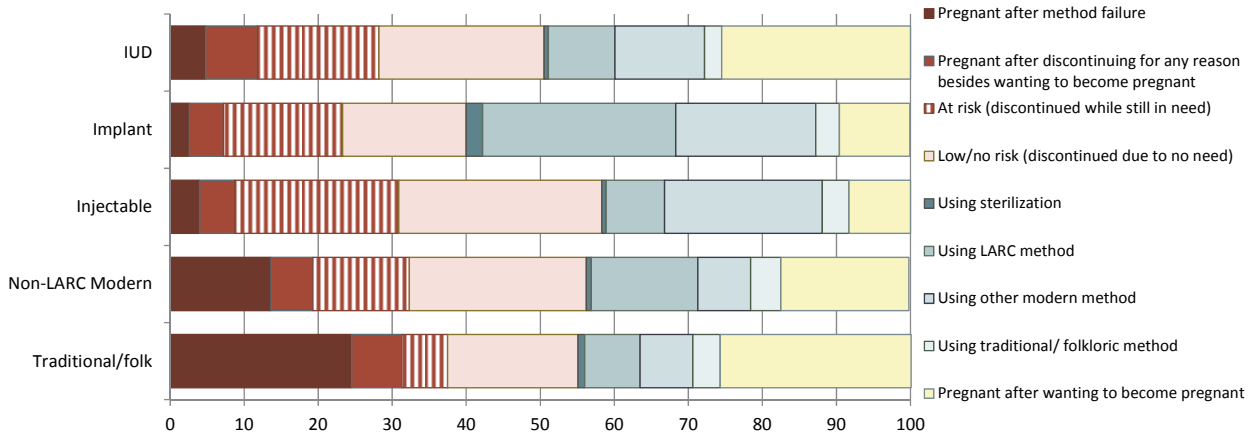
To gain insight into what happens after women discontinue using a method, we examined the status of women three months after they discontinued an episode of contraceptive use. Figure 4.8 summarizes these results, separately for each of the five method types, based on the pooled survey results. In the figure, women are either pregnant after a method failure, pregnant after discontinuing for reasons other than wanting to become pregnant, not using a method (at risk), using a family planning method (sterilization, LARC, other modern, traditional/folkloric), or pregnant after wanting to become pregnant. Women who are 'at risk' three months after discontinuing are further divided into two categories: those whom we consider at risk of an unwanted or too closely-spaced pregnancy, and those we consider to be at low or no risk. Women are at risk if they were not using family planning but discontinued while still in need– that is, due to a method-related reason or access/inconvenience. While these women may have had a change in fertility intentions and are not using three months later, they discontinued the method for reasons other than lack of need. Women are considered at low or no risk if they discontinued because they were sub-fecund or infecund, menopausal, or due to marital dissolution or the husband being away. In this category there is still some risk. For example, women who discontinued because their husbands are away may indeed be at high risk of unintended pregnancy when he returns, or women may incorrectly perceive themselves to be infecund. Indeed, a small proportion of those who are pregnant 3 months after discontinuation are women who originally discontinued because they perceived themselves to be at low risk of pregnancy.

When we look specifically at women who are pregnant either after a method failure or after discontinuing for reasons other than wanting to become pregnant, as expected the percentage is highest for women who were using traditional/folk methods. Three months after discontinuing traditional/folk methods, nearly one third of women fall in these two categories (32 percent), compared to 12 percent for IUD discontinuations, less than 10 percent for implant and injectable discontinuations, and 19 percent for non-LARC modern method discontinuations. However, if we add women still at risk to this total (see all red categories in Figure 4.8), there is remarkable consistency across method types. The main difference between LARCs and other modern methods or traditional/folk methods is the percent of women who are pregnant after method failure.

Comparing the five method types, women are most likely to be at risk of an unwanted or too closely-spaced pregnancy three months after discontinuing injectables. Women who discontinued traditional methods are least likely to still be at risk, but this is largely because they are now pregnant. Nearly 60 percent of women using traditional/folk methods are pregnant three months after discontinuing, compared to less than 20 percent for both implants and injectables, and 37 percent for both IUD and non-LARC modern methods.

The percentage of women who are using a family planning method three months after a discontinuation episode is highest for implant discontinuations, at 50 percent. Most of these women are using a LARC or non-LARC modern method three months later. For the other four methods, 33 percent or fewer are using any contraceptive method three months later.

Figure 4.8. Status 3 months after method discontinuation: Pooled results



Notes: Pooled results are averaged across all 21 countries, using DHS weights normalized relative to national population size according to United Nations (2010) estimates shown in Table 2.1. At risk means not using FP and discontinued while still in need (method failure, method-related reasons, inconvenience, access/cost, and opposition). Low/no risk means not using FP but discontinued due to a desire to become pregnant, marital dissolution, husband away, or perceived sub-fecund/menopause.

Tables 4.6-4.10 show women's status three months after they discontinued an episode of contraceptive use, for each method separately by country. Discontinuation is particularly problematic if DWSIN resulted in method failure, pregnancy for reasons other than wanting to become pregnant, or leaves women vulnerable to unintended pregnancy. Table 4.6 shows this distribution for women following IUD discontinuations, among discontinuation episodes to married women age 15 to 49 that ended 3 to 62 months preceding the survey, by country. Three months later, 12 percent of women are pregnant in the pooled sample either after a method failure (5 percent) or after discontinuing for a reason other than wanting to get pregnant (7 percent). Another 26 percent are pregnant after wanting to become pregnant, and nearly one quarter is using a method of family planning. Of the remaining 39 percent who are not using a family planning method, 16 percent are at risk of an unwanted or too closely-spaced pregnancy, while 22 percent are at no or low risk. The percentage of women at risk is highest in Pakistan, Tajikistan, and Zambia (31 percent, 29 percent, and 26 percent, respectively), and is lowest in Bangladesh and Egypt, at 11 percent in both countries.

Table 4.6. Status 3 months after discontinuing IUDs

Status 3 months after discontinuing IUDs, episodes among married women age 15 to 49 that ended 3 to 62 months preceding the survey, by country

	Pregnant			Not using FP		Using FP					
	After method failure	After wanting to become pregnant	After discon-tinuing for any other reason	At risk (discon-tinued while still in need)	Low/no risk (discon-tinued due to no need)	Using sterili-zation	Using LARC method	Using other modern method	Using traditional/ folkloric method	Total	Number of episodes
West Africa											
Burkina Faso 2010	*	*	*	*	*	*	*	*	*		18
Liberia 2013	*	*	*	*	*	*	*	*	*		2
Niger 2012	*	*	*	*	*	*	*	*	*		13
Nigeria 2013	4.0	34.5	4.4	17.1	26.9	0.0	3.0	4.6	5.5	100.0	124
Senegal 2014	*	*	*	*	*	*	*	*	*		9
Sierra Leone 2013	*	*	*	*	*	*	*	*	*		21
East and Southern Africa											
Burundi 2010	14.0	30.5	15.1	12.8	9.8	0.0	8.3	3.2	6.3	100.0	(34)
Comoros 2012	*	*	*	*	*	*	*	*	*		2
Rwanda 2010	*	*	*	*	*	*	*	*	*		9
Uganda 2011	*	*	*	*	*	*	*	*	*		16
Zambia 2013-14	12.5	17.5	6.3	25.5	3.3	0.0	15.3	19.6	0.0	100.0	(38)
Zimbabwe 2010-11	*	*	*	*	*	*	*	*	*		9
North Africa and West Asia											
Egypt 2014	5.8	33.4	5.6	11.1	26.3	0.1	6.1	11.3	0.3	100.0	4,766
Yemen 2013	4.9	15.3	12.3	18.5	17.1	0.5	7.6	18.8	5.0	100.0	781
Central Asia											
Kyrgyz Republic 2012	4.4	23.9	6.3	21.1	28.7	0.2	3.9	8.9	2.6	100.0	628
Tajikistan 2012	2.8	22.6	11.6	29.0	18.5	0.2	6.7	5.9	2.7	100.0	461
South and Southeast Asia											
Bangladesh 2011	2.5	4.5	5.3	11.3	10.3	6.1	20.3	36.2	3.4	100.0	80
Cambodia 2010	0.0	2.2	1.6	22.7	35.9	0.0	12.2	19.5	5.8	100.0	89
Indonesia 2012	4.0	15.6	3.8	18.4	18.5	1.6	20.7	14.9	2.4	100.0	552
Nepal 2011	0.0	5.0	4.8	14.5	24.1	7.0	17.9	22.3	4.4	100.0	53
Pakistan 2012-13	2.5	10.0	13.2	31.4	12.8	1.0	10.7	10.3	8.1	100.0	400
TOTAL	**4.8**	**25.5**	**7.0**	**16.4**	**22.3**	**0.6**	**9.0**	**12.1**	**2.3**	**100.0**	**8,102**

Notes: Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed. Discontinued while still in need includes method failure, discontinued for method-related reasons, inconvenience, access/cost, and opposition. Low/no risk means the woman is not using family planning but stated her reason for discontinuation was a desire to become pregnant, because she was sub-fecund or infecund, menopause, marital dissolution, and husband away. Pooled total results are averaged across all 21 countries, using DHS weights normalized relative to national population size according to United Nations (2010) estimates shown in Table 2.1.

Table 4.7 shows women's status three months after discontinuing implants. One half of women are using an FP method three months after discontinuing implants in the pooled sample, primarily LARC or non-LARC modern methods. One-third of women are not using any method three months later; 16 percent are considered at risk of an unwanted or too closely-spaced birth, while 17 percent are considered at low or no risk. The percentage of women at risk ranges from 11 percent in Zimbabwe to 53 percent in Sierra Leone. An additional 7 percent are pregnant either after a method failure (3 percent) or discontinuing for reasons other than wanting to get pregnant (5 percent). The remaining 10 percent of women in the pooled sample are pregnant three months after an implant discontinuation because they wanted to get pregnant; this percentage is highest in Cambodia, at 26 percent, and lowest in Bangladesh and Yemen, at 4 percent.

Table 4.7. Status 3 months after discontinuing implants

Status 3 months after discontinuing implants, episodes among married women age 15 to 49 that ended 3 to 62 months preceding the survey, by country

	Pregnant			Not using FP		Using FP					
	After method failure	After wanting to become pregnant	After discon-tinuing for any other reason	At risk (discon-tinued while still in need)	Low/no risk (discon-tinued due to no need)	Using sterili-zation	Using LARC method	Using other modern method	Using traditional/ folkloric method	Total	Number of episodes
West Africa											
Burkina Faso 2010	0.9	13.0	4.1	25.3	38.7	0.0	10.5	6.4	1.1	100.0	163
Liberia 2013	*	*	*	*	*	*	*	*	*		10
Niger 2012	*	*	*	*	*	*	*	*	*		8
Nigeria 2013	*	*	*	*	*	*	*	*	*		12
Senegal 2014	10.7	4.8	13.0	25.3	32.3	0.0	1.2	12.7	0.0	100.0	(58)
Sierra Leone 2013	2.0	13.5	3.6	53.3	10.1	0.7	9.7	6.5	0.4	100.0	67
East and Southern Africa											
Burundi 2010	*	*	*	*	*	*	*	*	*		4
Comoros 2012	*	*	*	*	*	*	*	*	*		20
Rwanda 2010	2.0	4.6	13.9	22.5	7.7	0.0	17.5	23.7	8.2	100.0	70
Uganda 2011	3.5	20.1	11.0	24.0	20.3	0.0	14.5	6.7	0.0	100.0	47
Zambia 2013-14	2.4	16.2	4.8	28.8	14.1	0.0	23.0	7.6	3.1	100.0	177
Zimbabwe 2010-11	7.0	22.2	11.7	10.9	11.7	0.0	7.0	29.5	0.0	100.0	47
North Africa and West Asia											
Egypt 2014	2.3	10.6	6.6	21.5	16.3	0.0	20.8	21.9	0.0	100.0	150
Yemen 2013	2.2	4.1	7.3	28.8	14.6	0.0	10.2	25.5	7.3	100.0	120
Central Asia											
Kyrgyz Republic 2012	*	*	*	*	*	*	*	*	*		0
Tajikistan 2012	*	*	*	*	*	*	*	*	*		1
South and Southeast Asia											
Bangladesh 2011	1.4	4.3	3.4	11.9	10.3	5.7	19.3	35.3	8.3	100.0	108
Cambodia 2010	4.7	26.1	0.0	14.7	14.3	1.7	6.4	20.5	11.7	100.0	25
Indonesia 2012	2.6	9.1	2.6	13.2	17.0	2.4	32.5	18.0	2.6	100.0	654
Nepal 2011	0.0	12.1	3.3	15.7	19.6	6.1	28.5	4.0	10.7	100.0	49
Pakistan 2012-13	*	*	*	*	*	*	*	*	*		10
TOTAL	**2.6**	**9.5**	**4.6**	**16.1**	**16.7**	**2.2**	**26.1**	**18.9**	**3.2**	**100.0**	**1,799**

Notes: See Table 4.6.

Table 4.8 is similar to Tables 4.6 and 4.7 above, but shows women's status three months after discontinuing injectables. Compared with the IUD and implant, a higher percentage of women who discontinued injectables are at risk of an unwanted or too closely-timed pregnancy three months later (22 percent). This percentage is especially high in Liberia (60 percent), and is moderately high (40-50 percent) in Sierra Leone, Uganda, and Pakistan. The percentage of women who are not using any method but who are considered to be at low or no risk is also higher for injectables than for implants or IUDs in the pooled sample (27 percent).

Similar to the distribution for implants, one-third of women are using a FP method three months later in the pooled sample; most often it is a non-LARC modern method (21 percent). The percentage of women using a FP method three months later is notably lower in West Africa and in some East and Southern African countries, as compared with North Africa and West Asia, Central Asia, and South and Southeast Asia.

Table 4.8. Status 3 months after discontinuing injectables

Status 3 months after discontinuing injectables, episodes among married women age 15 to 49 that ended 3 to 62 months preceding the survey, by country

	Pregnant			Not using FP		Using FP					
	After method failure	After wanting to become pregnant	After discon-tinuing for any other reason	At risk (discon-tinued while still in need)	Low/no risk (discon-tinued due to no need)	Using sterili-zation	Using LARC method	Using other modern method	Using traditional/ folkloric method	Total	Number of episodes
West Africa											
Burkina Faso 2010	0.6	10.0	2.7	31.1	47.1	0.0	1.8	5.6	1.1	100.0	725
Liberia 2013	5.5	5.3	7.1	60.5	16.0	0.0	0.4	4.3	0.9	100.0	382
Niger 2012	0.5	9.5	6.3	30.9	40.1	0.0	0.3	11.7	0.7	100.0	403
Nigeria 2013	9.9	20.4	3.8	26.9	27.8	0.1	3.0	4.5	3.6	100.0	673
Senegal 2014	0.8	13.1	12.9	34.3	27.1	0.0	2.9	7.8	1.0	100.0	506
Sierra Leone 2013	4.3	13.7	9.0	43.2	19.2	0.0	1.9	7.9	0.8	100.0	516
East and Southern Africa											
Burundi 2010	4.5	8.2	6.9	34.5	31.9	0.2	6.3	6.6	0.9	100.0	637
Comoros 2012	5.4	14.4	9.7	35.5	22.7	0.0	2.8	8.3	1.3	100.0	157
Rwanda 2010	5.3	8.7	8.5	26.0	16.5	0.2	14.0	16.6	4.2	100.0	1,320
Uganda 2011	7.3	9.8	12.4	40.5	20.3	0.4	2.4	5.2	1.7	100.0	1,143
Zambia 2013-14	6.6	21.0	10.1	26.7	21.7	0.1	3.6	8.9	1.3	100.0	1,778
Zimbabwe 2010-11	6.1	19.6	5.5	19.9	20.2	0.0	5.0	22.7	1.1	100.0	582
North Africa and West Asia											
Egypt 2014	3.8	8.8	4.5	25.8	30.8	0.1	10.0	15.7	0.4	100.0	2,236
Yemen 2013	4.6	7.3	11.2	35.9	16.5	0.2	4.9	16.9	2.5	100.0	1,122
Central Asia											
Kyrgyz Republic 2012	11.5	3.5	4.3	6.8	40.8	0.0	19.0	8.5	5.5	100.0	42
Tajikistan 2012	0.9	9.4	16.0	36.6	18.8	0.0	3.9	12.9	1.5	100.0	112
South and Southeast Asia											
Bangladesh 2011	4.7	5.0	3.4	17.8	21.5	2.3	6.6	30.9	7.7	100.0	2,010
Cambodia 2010	5.0	5.0	4.6	33.0	26.4	1.0	3.6	16.3	5.2	100.0	869
Indonesia 2012	3.3	7.8	3.4	16.3	31.0	0.3	10.1	25.3	2.6	100.0	10,264
Nepal 2011	1.3	3.1	4.1	27.7	38.1	3.2	4.6	12.4	5.6	100.0	1,568
Pakistan 2012-13	3.9	9.0	6.7	41.9	13.6	0.5	2.4	12.9	9.2	100.0	801
TOTAL	**4.0**	**8.3**	**4.7**	**22.2**	**27.4**	**0.6**	**7.9**	**21.3**	**3.6**	**100.0**	**27,844**

Notes: See Table 4.6.

Table 4.9 shows women's status three months after discontinuing non-LARC modern methods. In the pooled sample, 26 percent are using any FP method three months later (14 percent are using a LARC method, 7 percent a non-LARC modern method, 4 percent a traditional/folk method, and 1 percent using sterilization). Among the 37 percent not using a method, 13 percent are considered at risk while 24 percent are not at risk in the pooled sample. The percentage of women at risk is particularly high in Liberia (41 percent) and is lowest in Bangladesh and Egypt (9 percent and 10 percent, respectively). An additional 19 percent in the pooled sample are pregnant after either a method failure (14 percent) or discontinuing for a reason other than wanting to become pregnant (6 percent). The remaining 17 percent of women in the pooled sample are pregnant after discontinuing because they wanted to become pregnant, and this ranges from 8 percent in Nepal to 33 percent in Zimbabwe.

Table 4.9. Status 3 months after discontinuing non-LARC modern methods

Status 3 months after discontinuing non-LARC modern methods (excluding female sterilization), episodes among married women age 15 to 49 that ended 3 to 62 months preceding the survey, by country

	Pregnant			Not using FP		Using FP					
	After method failure	After wanting to become pregnant	After discon-tinuing for any other reason	At risk (discon-tinued while still in need)	Low/no risk (discon-tinued due to no need)	Using sterili-zation	Using LARC method	Using other modern method	Using traditional/ folkloric method	Total	Number of episodes
West Africa											
Burkina Faso 2010	5.5	18.5	5.7	18.9	41.2	0.3	6.4	2.8	0.6	100.0	610
Liberia 2013	14.3	11.5	17.2	40.9	8.5	0.0	7.0	0.3	0.4	100.0	251
Niger 2012	1.7	18.0	14.5	19.9	35.5	0.0	4.8	4.5	1.0	100.0	2,104
Nigeria 2013	10.7	24.7	5.8	22.7	17.9	0.0	4.6	6.1	7.5	100.0	1,694
Senegal 2014	6.6	16.4	10.5	27.5	25.3	0.0	9.7	2.0	2.0	100.0	506
Sierra Leone 2013	9.4	12.8	9.4	30.6	16.8	0.0	19.8	1.2	0.1	100.0	481
East and Southern Africa											
Burundi 2010	11.2	13.8	10.9	22.8	17.8	0.0	19.7	1.1	2.7	100.0	280
Comoros 2012	11.3	15.1	15.5	20.3	27.7	0.0	0.8	1.6	7.7	100.0	120
Rwanda 2010	15.3	9.7	9.0	14.9	7.5	0.0	34.7	3.5	5.6	100.0	769
Uganda 2011	16.6	14.7	12.2	22.2	12.6	0.5	15.9	2.1	3.2	100.0	450
Zambia 2013-14	12.4	23.2	9.8	18.0	13.6	0.1	15.3	5.5	2.0	100.0	2,684
Zimbabwe 2010-11	13.5	32.5	6.6	12.3	20.8	0.1	7.6	6.2	0.5	100.0	2,564
North Africa and West Asia											
Egypt 2014	17.4	20.8	4.3	10.4	29.4	0.1	15.6	1.8	0.4	100.0	5,217
Yemen 2013	17.3	11.8	9.4	18.2	18.0	0.3	10.4	9.2	5.3	100.0	6,635
Central Asia											
Kyrgyz Republic 2012	16.5	17.0	4.9	12.3	19.1	0.4	8.3	17.5	3.9	100.0	613
Tajikistan 2012	9.9	14.2	6.1	30.5	14.4	0.7	13.0	8.7	2.5	100.0	400
South and Southeast Asia											
Bangladesh 2011	14.0	14.5	3.0	9.0	27.7	1.3	13.9	11.9	4.6	100.0	7,496
Cambodia 2010	5.5	16.1	8.0	22.9	23.9	0.9	10.7	4.4	7.6	100.0	1,647
Indonesia 2012	11.4	13.1	6.3	11.2	22.2	0.2	28.8	3.6	3.2	100.0	5,495
Nepal 2011	5.5	7.9	2.6	13.0	49.7	1.6	6.8	8.3	4.6	100.0	1,803
Pakistan 2012-13	16.1	24.0	8.4	16.9	16.3	1.2	4.8	5.8	6.5	100.0	2,495
TOTAL	**13.6**	**17.3**	**5.7**	**13.0**	**23.9**	**0.7**	**14.4**	**7.1**	**4.1**	**100.0**	**44,313**

Notes: See Table 4.6.

Lastly in this series, Table 4.10 shows women's status three months after discontinuing traditional or folkloric methods. Nearly 60 percent of women in the pooled sample are pregnant three months after discontinuing traditional methods (57 percent), ranging from 21 percent in Nepal to 77 percent in Nigeria. Among these, in the pooled sample 25 percent are pregnant after a method failure, 7 percent are pregnant after discontinuing for reasons other than wanting to become pregnant, and 26 percent are pregnant after discontinuing because they wanted to become pregnant. Of the remaining 43 percent, 19 percent are using a family planning method, and 24 percent are not using any method three months later. Among the 24 percent not using a method, 6 percent are considered at risk of an unwanted or closely-spaced pregnancy within three months, while the remaining 18 percent are considered at low or no risk. The percentage of women at risk is highest in Niger at 21 percent and lowest in Nigeria and Zambia, at 4 percent.

Table 4.10. Status 3 months after discontinuing traditional or folkloric methods

Status 3 months after discontinuing traditional or folkloric episodes, episodes among married women age 15 to 49 that ended 3 to 62 months preceding the survey, by country

	Pregnant			Not using FP		Using FP					
	After method failure	After wanting to become pregnant	After discon-tinuing for any other reason	At risk (discon-tinued while still in need)	Low/no risk (discon-tinued due to no need)	Using sterili-zation	Using LARC method	Using other modern method	Using traditional/ folkloric method	Total	Number of episodes
West Africa											
Burkina Faso 2010	26.8	29.4	4.1	9.6	20.7	0.0	7.1	1.8	0.5	100.0	137
Liberia 2013	*	*	*	*	*	*	*	*	*		29
Niger 2012	2.6	25.7	21.2	20.5	25.3	0.0	0.6	4.1	0.0	100.0	237
Nigeria 2013	23.4	42.5	10.8	3.7	13.4	0.0	2.5	1.7	2.0	100.0	1,242
Senegal 2014	15.3	26.5	13.8	9.2	17.3	0.0	8.6	8.7	0.6	100.0	76
Sierra Leone 2013	31.5	13.6	13.6	14.2	16.6	0.0	8.6	1.9	0.0	100.0	56
East and Southern Africa											
Burundi 2010	38.2	25.3	9.3	8.7	9.9	0.3	5.6	2.0	0.8	100.0	193
Comoros 2012	18.4	29.3	17.9	9.4	15.5	0.0	2.5	4.7	2.4	100.0	86
Rwanda 2010	39.8	23.6	6.3	5.1	5.8	0.0	12.5	4.7	2.2	100.0	358
Uganda 2011	44.7	27.6	3.8	6.1	5.8	0.5	6.2	3.8	1.5	100.0	280
Zambia 2013-14	32.2	24.5	7.5	4.2	8.2	0.1	13.5	9.1	0.6	100.0	774
Zimbabwe 2010-11	31.7	21.3	2.1	13.4	7.3	0.0	5.8	17.5	1.0	100.0	103
North Africa and West Asia											
Egypt 2014	25.4	10.9	7.0	10.8	9.5	0.0	22.8	13.0	0.6	100.0	552
Yemen 2013	35.1	18.7	6.4	6.4	11.3	0.3	6.5	9.4	5.9	100.0	897
Central Asia											
Kyrgyz Republic 2012	18.6	19.3	1.9	9.1	13.3	0.0	13.0	18.1	6.7	100.0	137
Tajikistan 2012	23.6	17.7	8.2	14.2	11.4	0.0	8.8	9.7	6.3	100.0	113
South and Southeast Asia											
Bangladesh 2011	26.7	15.3	2.5	6.9	18.5	2.3	10.5	12.8	4.6	100.0	984
Cambodia 2010	25.4	19.7	3.6	10.8	13.9	0.5	6.6	10.4	9.3	100.0	981
Indonesia 2012	24.3	22.6	13.7	4.9	11.0	0.0	12.0	6.5	5.0	100.0	888
Nepal 2011	9.4	10.6	1.2	4.6	55.9	1.8	5.6	5.0	5.9	100.0	732
Pakistan 2012-13	21.2	31.5	5.4	6.2	21.7	1.4	3.6	5.5	3.6	100.0	1,046
TOTAL	**24.5**	**25.8**	**6.8**	**6.2**	**17.6**	**0.9**	**7.5**	**7.1**	**3.7**	**100.0**	**9,900**

Notes: See Table 4.6.

5. Policy and Programmatic Linkages

Women and couples select, start, and stop contraceptive methods within particular local and national supply and care environments. Cultural and societal norms influence overall method mix. Skews in mix may not be problematic if a broad spectrum of options is available (Bertrand et al. 2014). Women's preferences certainly differ from country to country. On the other hand, when 67 times as many women use a method like IUD in one country (Tajikistan) versus another (Bangladesh), the disparity probably reflects underlying variations in access, availability, and programs available to women. Differences in method use are partly a product of disparities in access to health care, method choice, and provider training (Sullivan et al. 2006), as well as individual preferences and culture. Side effects, for example, are known clinically but their incidence, significance, and tolerability may be related to the quality of provision and counseling, and informed choice. Some studies have shown that higher-quality counseling and provision reduces discontinuation rates (Ali, Marshall, and Babiker 2001; Creanga et al. 2007).

In this section, we quantify the dimension of experience related to supply, programs, and policies to understand what influences discontinuation. Is popularity of a method, access to that method, or quality of FP programs overall significantly related to discontinuation? As a proxy for unobserved variation in the programmatic environment between countries, we use Family Planning Effort (FPE) scores, which are available individually for the three LARC methods by country, along with overall quality scores. As described in Chapter 2, these scores range from 0 to 100, and are based on average assessments by local experts of the degree to which the entire population has ready and safe access to a particular method or of the overall quality of FP services.

The FPE access scores are meant to indicate the "ready and easy access" to a particular method in a given country. In areas where access is greater, providers may be better-educated about guidelines for use and better able to advise about possible side effects. However, access is not the same as demand. Availability and use may not be correlated. Part of method choice is giving women the right *not* to opt for a particular method. The percent of users, rather than access, may also be a good proxy for actual support of a method or for provider bias. Women who are using a popular method may be more supported in their choice, while women using a minority method may feel more isolated and have more difficulty with the method. For this reason, we test the effects of FPE access scores, share of method mix, and overall programmatic quality in our models of discontinuation. Women and couples who have the opportunity to make well-informed method choices, and who receive better counseling on their method may be more aware of potential side effects and how to cope with them. Higher-quality provision of services and safe clinical procedures for methods that require provider insertion, like IUDs and implants, may also reduce the failure rate.

Table 5.1 lists FPE scores for access to injectables and IUDs from 2009, and implant FPE scores from 2014, which was the first year they became available. Although a few of the DHS surveys analyzed in this report were fielded in 2014, 2009 scores are preferable because they overlap with retrospective five-year time period from every survey used. Quality scores are listed for 2009. Comoros is not rated for scores in any year; Rwandan scores from 2009 were missing; and implant scores from 2014 were not produced for Sierra Leone, Burkina Faso, or Cambodia.

Of the remaining countries, the average access score is 45 for IUDs, 51 for implants, and 57 for injectables. The IUD scores are lowest in Western and Eastern Africa as a whole, with ranges from 16 to 44 in those countries, and highest in Egypt and Central Asia (Kyrgyz Republic and Tajikistan). Implant scores show tremendous regional diversity, with the highest scoring four focal countries spanning all four

regions studied (Rwanda, Senegal, Tajikistan, and Bangladesh). Injectable scores are above 40 in all countries and as high as 80 in Indonesia. The FP program quality score for focal countries ranges from 25 in Yemen to 72 in Zimbabwe; its average is 50.

Table 5.1. Selected Family Planning Effort (FPE) scores, focal countries

	IUD Access Score, 2009	Implant Access Score, 2014	Injectable Access Score, 2009	Overall Quality of FP Programs Score, 2009
West Africa				
Burkina Faso 2010	44.4	na	62.2	37.8
Liberia 2013	16.2	43.3	43.4	33.3
Niger 2012	41.4	58.7	58.6	60.6
Nigeria 2013	27.8	30.6	34.3	38.9
Senegal 2014	43.7	69.8	65.2	60.7
Sierra Leone 2013	25.3	na	46.5	44.4
East and Southern Africa				
Burundi 2010	35.9	57.3	54.8	42.7
Rwanda 2010	na	77.8	na	na
Uganda 2011	30.2	49.6	57.9	45.2
Zambia 2013-14	22.2	38.9	44.4	43.3
Zimbabwe 2010-11	39.5	50.5	76.7	72.2
North Africa and West Asia				
Egypt 2014	85.9	46.2	77.8	60.0
Yemen 2013	45.2	33.3	44.4	25.4
Central Asia				
Kyrgyz Republic 2012	71.3	44.4	45.4	46.3
Tajikistan 2012	83.7	72.2	62.2	70.6
South and Southeast Asia				
Bangladesh 2011	52.3	61.1	62.1	54.9
Cambodia 2010	50.0	na	60.0	51.9
Indonesia 2012	52.5	52.5	80.0	62.6
Nepal 2011	45.3	42.6	69.2	55.6
Pakistan 2012-13	37.0	31.6	40.7	42.2
AVERAGE, FOCAL COUNTRIES	**44.7**	**50.6**	**57.1**	**49.9**

Notes: na indicates score was not measured. Implant access not measured in 2009; 2014 scores were used instead.

For information about 2009 scores, see Ross and Smith (2010); for information about 2014 implant access scores, see Kuang and Weinberger (2015).

Figures 5.1-5.3 are scatter plots representing the relationship between the use of each LARC method and the method's respective FPE access score, with a regression line of best fit for each method. Figure 5.1 shows that the use of IUDs (at the time of survey) is positively correlated with IUD access (based on 2009 access scores). Three main outliers with very high access and use are Egypt, Kyrgyz Republic, and Tajikistan. The implant FPE access score, measured in 2014, is very weakly correlated with use (Figure 5.2). Injectables as a share of method mix is also weakly related to access in 2009 (Figure 5.3). As Ross and Hardee (2013) found, the relationship between access and method use appears to vary by method type. In our country sample, the use of IUDs tends to be strongly correlated with access while the use of implants and injectables is not.

Figure 5.1. IUD share of method mix versus FPE IUD Access Score (2009), focal countries

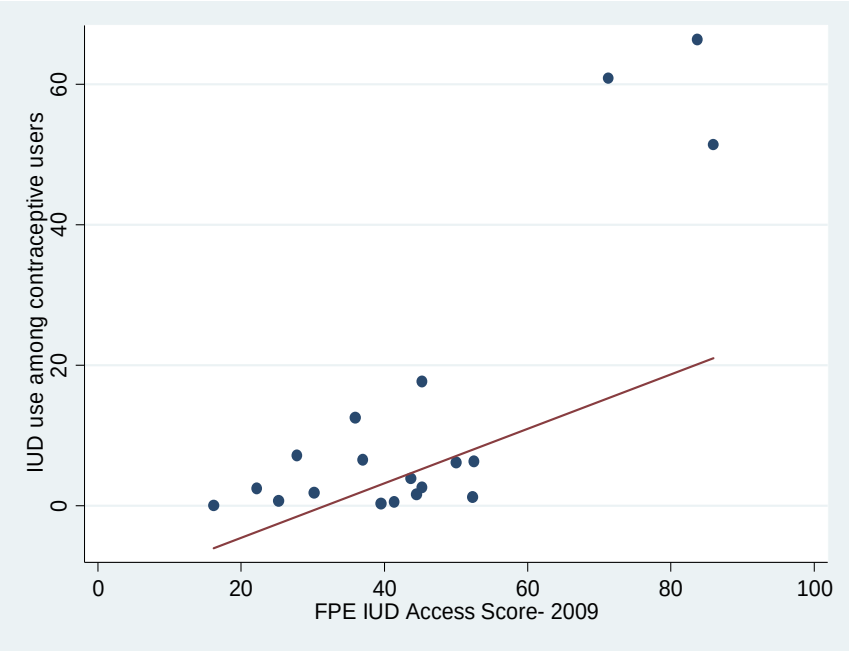


Figure 5.2. Implant share of method mix versus FPE implant Access Score (2014), focal countries

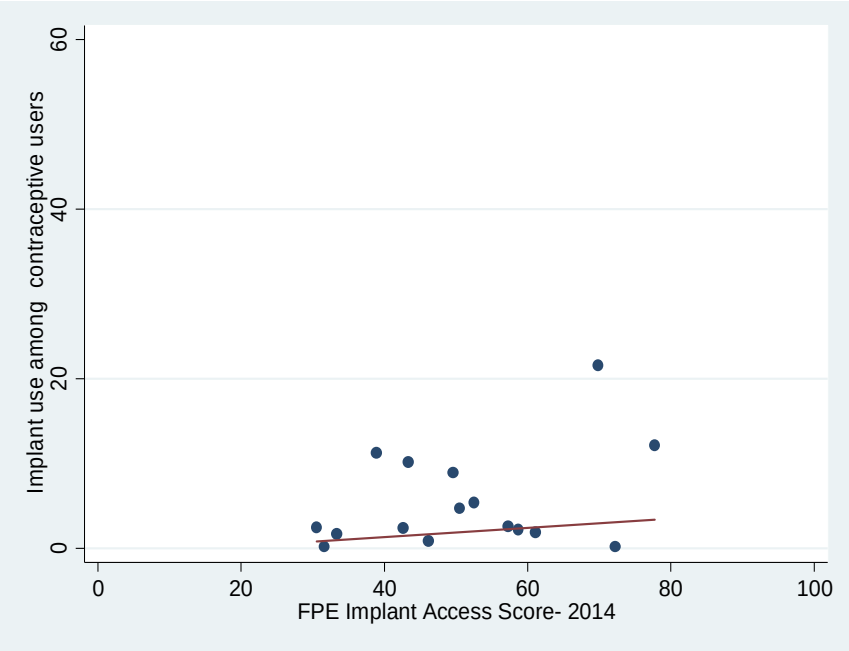
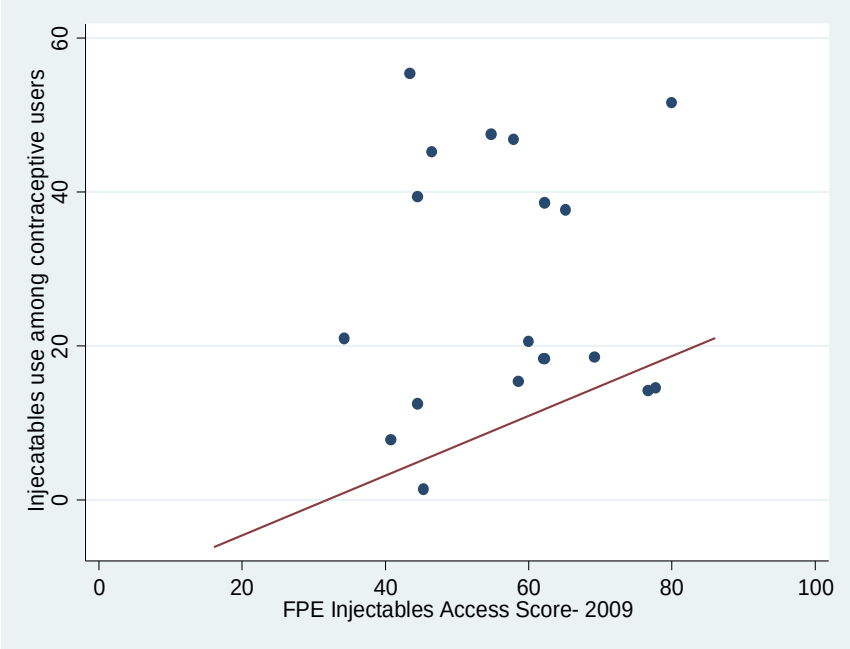


Figure 5.3. Injectable share of method mix versus FPE Injectable Access Score (2009), focal countries



To quantify the effects of women's individual characteristics while accounting for within-country clustering in unobserved effects as well as country programmatic environments, we model the hazard of discontinuing a given LARC method while still in need using pooled multilevel Weibull survival regression models. Duration of use in months is input into the model. Failure is defined as DWSIN (experiencing method failure, discontinuing for side effects, method-related reasons, cost/access, or other reasons unrelated to lack of need); ongoing use at time of survey and discontinuation for any other reasons is considered right censoring. It is important to note that survival models do not necessarily imply that the risk of the ultimate event (DWSIN) itself is higher or lower. Instead they measure the rate of progress: when the hazard is lower, users progress more slowly towards DWSIN. In other words, they sustain use while still in need for a longer period of time. The key individual factors considered in the multilevel model are women's age and parity at the time the method was started, current education and residence, and how women arrived at method use (from birth/PPA/LAM, switching from another method, or starting from non-use). At the country level we consider the FPE access score of the LARC method the woman is using, the share of that method in the method mix, and the overall quality score of FP programs.

Table 5.2 shows the results for pooled multilevel hazard models of IUD discontinuation. Unadjusted coefficients with country-level random effects show that higher age, greater parity, urban residence, and more education significantly reduce the hazard of DWSIN. Additionally, if the episode of IUD use is immediately preceded by use of another method or by birth/LAM/PPA, the hazard of DWSIN is greatly reduced. IUD access scores, the share of method mix, and overall quality of family planning programs are each inversely related to the hazard of DWSIN.

The second IUD model in Table 5.2, an adjusted model of individual characteristics, finds that these individual characteristics each remain statistically significant even when considered jointly. Model 3, which incorporates IUD access scores, finds a significant effect of IUD access on the hazard of DWSIN even after controlling for other factors. Each additional point of score reduces the hazard of DWSIN by 3

percent. The country's IUD share of method mix is not statistically significant in the adjusted model (Model 4). The overall quality of FP programs (Model 5) is, however, significant. Women who live in countries with higher-quality FP programs have longer sustained use of IUDs while still in need.

The combined model of access and share of method mix (Model 6) finds that access and share of method mix are inversely related, and the two nearly cancel each other out. This is likely the result of high collinearity between access scores and use of IUDs. The final combined model of access and quality (Model 7) finds that the quality of FP programs is more important than access to IUDs. Even after controlling for individual characteristics and for overall access to IUDs, for every point of increase in the quality score, the hazard of discontinuing an IUD while still in need is reduced by 4 percent.

Table 5.2. Pooled multilevel hazard model of discontinuing IUDs while still in need

Among married women age 15 to 49 who began using an IUD 3 to 62 months preceding the survey, using weights normalized to relative population size and country-level random effects (RE)

	Model 1: Unadjusted Coefficients	Model 2: Individual factors	Model 3: Access	Model 4: Use	Model 5: Quality	Model 6: Access and Use	Model 7: Access and Quality
	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio
Age at start of use							
<24 (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25-34	0.12***	0.53***	0.61***	0.63***	0.74***	0.70***	0.72***
35-49	0.10***	0.36***	0.41***	0.37***	0.54***	0.44***	0.51***
Parity at start of use							
0-1 (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2-3	0.10***	0.28***	0.41***	0.71**	0.45***	0.64***	0.46***
4+	0.14***	0.26***	0.35***	0.97	0.39***	0.71***	0.39***
Residence							
Rural (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Urban	0.14***	0.78***	0.72**	0.93	0.78	0.92	0.77
Education							
None (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Primary	0.16***	0.42**	0.70	1.03	0.76	1.10	0.80
Secondary+	0.09***	0.21***	0.55**	0.71*	0.71*	0.85*	0.75***
Event immediately preceding use							
From non-use (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
from use	0.16***	0.66***	0.88**	1.14	1.11	1.27	1.08
from birth, PPA, LAM	0.11***	0.30***	0.70***	0.76***	0.76***	0.81***	0.81***
Country's IUD Access Score, 2009	0.95***		0.97***			0.95**	0.99
Country's IUD share of method mix among married women 15-49	0.94***			0.99		1.04*	
Country's overall FP quality score, 2009	0.93***				0.95***		0.96*
Observations	10,946	10,946	10,946	10,946	10,946	10,946	10,946
Countries[1]	19	19	19	19	19	19	19

* p<0.05, ** p<0.01, *** p<0.001

Notes: Share of method mix and FPE scores are continuous variables from 0 to 100. Discontinuation while still in need means the woman became pregnant due to method failure, or discontinued due to side effects, method-related reasons, cost/access, opposition, or other.

[1] Models exclude Comoros and Rwanda which lacked 2009 FPE scores.

Pooled multilevel hazard models of implant discontinuation are shown in Table 5.3. As with IUDs, the unadjusted coefficients are each statistically significant: higher age, higher parity, urban residence, more education, and starting a method from use or from birth/PPA/LAM each reduce the hazard of DWSWIN. Additionally, living in a country with better access to implants, with a higher share of implants in the method mix, or with higher-quality FP programs overall reduces the hazard of DWSIN. In the adjusted model of individual factors (Model 2), individual characteristics remain statistically significant. Interestingly, urban residence changes from a negative to a positive effect on the hazard. In other words, after adjusting for other individual characteristics, urban residents have a 10 percent higher hazard of discontinuing implants while still in need than rural residents. However, in models that include country characteristics (Models 3 to 7), none of the individual factors, including residence, are statistically significant.

Country-level access to implants (Model 3) and overall quality of FP programs (Model 5) each reduce the hazard of DWSIN even after controlling for other characteristics; living in a country where implants are more common (Model 4) does not. A joint model of access to and use of implants (Model 6) finds that when both are considered, neither is significant. However the adjusted model of access and quality finds that both are important: better access to implants and higher-quality FP programs significantly reduce the hazard of discontinuing implants while still in need.

Table 5.3. Pooled multilevel hazard model of discontinuing implants while still in need

Among married women age 15 to 49 who began using implants 3 to 62 months preceding the survey, incorporating weights normalized to relative population size and country-level random effects (RE)

	Model 1: Unadjusted Coefficients	Model 2: Individual factors	Model 3: Access	Model 4: Use	Model 5: Quality	Model 6: Access and Use	Model 7: Access and Quality
	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio
Age at start of use							
<24 (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25-34	0.12***	0.62***	0.60	0.69	0.69	0.84	0.68
35-49	0.11***	0.56*	0.59	0.72	0.72	0.97	0.71
Parity at start of use							
0-1 (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2-3	0.11***	0.25***	1.00	0.96	0.96	0.77	0.96
4+	0.12***	0.21***	1.11	1.03	1.03	0.75	1.03
Residence							
Rural (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Urban	0.18***	1.10*	0.99	1.01	1.01	1.06	1.01
Education							
None (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Primary	0.07***	0.14***	0.64	0.86	0.86	0.97	0.85
Secondary+	0.09***	0.14***	0.89	1.21	1.21	1.37	1.20
Event immediately preceding use							
From non-use (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
from use	0.11***	0.37***	0.94	1.00	1.00	0.95	0.99
from birth, PPA, LAM	0.17***	0.54***	1.10	1.19	1.19	1.22	1.18
Country's implant access score, 2014	0.89***		0.90***			0.99	0.94***
Country's implant share of method mix among married women 15-49	0.53***			1.03		1.01	
Country's overall FP quality score, 2009	0.90***				0.90***		0.95***
Observations	3,257	3,257	3,257	3,257	3,257	3,257	3,257
Countries[1]	15	15	15	15	15	15	15

* p<0.05, ** p<0.01, *** p<0.001

Notes: Share of method mix and FPE scores are continuous variables from 0 to 100. Discontinuation while still in need means the woman became pregnant due to method failure, or discontinued due to side effects, method-related reasons, cost/access, opposition, or other.

[1] Models exclude Comoros, Burkina Faso, Sierra Leone, and Cambodia, which lacked 2014 FPE implant access scores; Kyrgyz Republic, which lacked implant users; and Rwanda, which lacked 2009 FPE scores.

Table 5.4 presents the results of multilevel hazard models of discontinuing injectables while still in need. Unadjusted coefficients are again statistically significant, except for urban residence and switching to injectables from another method (Model 1). When individual characteristics are modeled together (Model 2), parity, education, and starting a method after birth/PPA/LAM remain significant predictors of the hazard of DWSIN. Adjusted models of access to injectables (model 3), country-level use of injectables (Model 4), and overall quality of FP programs (Model 5) find that each of these factors significantly reduces the hazard of DWSIN. Even after controlling for individual characteristics, each percentage point of increased injectable share in the method mix reduced the hazard of DWSIN by 3 percent. However, access and use considered jointly (Model 6) are not significant.

Table 5.4 also shows that when access to injectables and overall quality of FP programs are considered jointly (Model 7), we find that women who live in countries with higher-quality FP programs have slower time-to-discontinuation while still in need. This effect was statistically significant after controlling for women's characteristics, country effects, and access to injectables. Additionally, in this model, women who start a method after birth/PPA/LAM have a 21 percent lower hazard of DWSIN. Interestingly, the adjusted models find that women who have switched to injectables after discontinuing another method have a higher hazard of DWSIN.

Table 5.4. Pooled multilevel hazard model of discontinuing injectables while still in need

Among married women age 15 to 49 who began using injectables 3 to 62 months preceding the survey, incorporating weights normalized to relative population size and country-level random effects (RE)

	Model 1: Unadjusted Coefficients	Model 2: Individual factors	Model 3: Access	Model 4: Use	Model 5: Quality	Model 6: Access and Use	Model 7: Access and Quality
	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio
Age at start of use							
<24 (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25-34	0.18***	0.70***	1.03	0.91	0.98	1.03	1.02
35-49	0.20***	0.72	1.12	1.04	0.95	1.10	1.09
Parity at start of use							
0-1 (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2-3	0.17***	0.40***	0.60***	0.38***	0.96	0.71**	0.71*
4+	0.20***	0.28***	0.37***	0.24***	0.94	0.49***	0.50***
Residence							
Rural (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Urban	0.95	0.87	0.92	0.97	1.04	0.96	0.96
Education							
None (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Primary	0.12***	0.19***	0.59**	0.42***	0.80	0.70**	0.70**
Secondary+	0.13***	0.19***	0.65	0.41***	0.95	0.82	0.82
Event immediately preceding use							
From non-use (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
from use	1.62	0.94	1.58	0.92	1.68	1.73*	1.74*
from birth, PPA, LAM	0.72***	0.43***	0.79***	0.56***	0.76***	0.80***	0.79***
Country's injectables access score, 2009	0.95***		0.96***			0.99	1.00
Country's injectables share of method mix among married women 15-49	0.94***			0.97***		0.99	
Country's overall FP quality score, 2009	0.94***				0.94***		0.94*
Observations	34,141	34,141	34,141	34,141	34,141	34,141	34,141
Countries[1]	19	19	19	19	19	19	19

* p<0.05, ** p<0.01, *** p<0.001

Notes: Share of method mix and FPE scores are continuous variables from 0 to 100. Discontinuation while still in need means the woman became pregnant due to method failure, or discontinued due to side effects, method-related reasons, cost/access, opposition, or other.

[1] Models exclude Comoros and Rwanda which lacked 2009 FPE scores.

Overall, the results from multilevel survival models indicate that women are significantly more likely to continue a LARC method while still in need if its adoption is immediately preceded by a birth, LAM, or PPA. When access and share of method mix are considered jointly, they are not significant and in the same direction for any of the three LARC methods. The quality of FP programs is inversely related to DWSIN. Access and quality are key for method continuation, but quality seems to be the more important of the two.

6. Discussion and Conclusions

The proportion of women using LARC methods—IUD, implants, and injectables—has increased worldwide over the last few decades (Bertrand et al. 2014; Darroch 2013). However, the use of the individual long-acting reversible contraceptive methods varies substantially across and within regions. Among married women in low-income countries, IUDs are more predominant in Asia than sub-Saharan Africa (Ali et al. 2011; Bertrand et al. 2014; Mansour et al. 2011; Seiber, Bertrand, and Sullivan 2007). This was true of our 21 country sample as well. The highest proportions of use of both implants and injectables are found in sub-Saharan Africa, where they also constitute a growing share of the method mix (Bertrand et al. 2014; Mansour et al. 2011; Seiber, Bertrand, and Sullivan 2007).

We examined the contraceptive dynamics of LARC methods among married women in 21 low-income countries by using DHS calendar episodes to examine adoption, discontinuation, and status after discontinuation. Additionally, we modeled the hazard of discontinuation based on women's individual characteristics, country effects, and access scores.

There are important limitations to our analysis. First, the quality of calendar data is not well-studied. Although some studies have found relative consistency of the data (Bradley, Schwandt, and Khan 2009; Curtis and Blanc 1997), a more recent study found substantial underreporting in the calendar, particularly among short-term and traditional methods (Bradley, Winfrey, and Croft 2015). Second, the sample sizes for some methods in countries were limited, particularly for implants and IUDs. Third, although the decision may have involved several factors, women were required to select one main reason for discontinuation. Little detail is given for lack of need or side effects and health concerns. Fourth, the type of IUD (hormonal or non-hormonal) or the duration of injectable was generally not available. Fifth, implant accessibility scores were only available for 2014; in most cases, this was after the survey was fielded. Finally, quality and accessibility scores are not available at subregional levels; national numbers may not reflect the local environment or individual experience. Despite these limitations, the results enable us to draw some conclusions from the study.

In terms of method adoption, IUDs are the method most commonly preceded by a birth, LAM, or PPA. This is particularly the case in Egypt, Indonesia, and Zambia, and may reflect the success of postpartum FP efforts in those countries. Implants are most frequently preceded by discontinuation of IUDs or injectables, which—in countries where IUDs are rarely used—may reflect a desire for a longer-term method among those switching from injectables.

In terms of failure and discontinuation, our results are broadly consistent with clinical data and previous studies, which indicate that failure rates are much lower for LARCs than for other modern or traditional methods. There is some evidence of higher failure rates than expected for IUDs which deserve additional investigation. While most methods of FP can be passively discontinued, IUDs and implants are two methods designed to be discontinued with the assistance of a provider. As expected, we find that IUDs and implants have the lowest overall rates of discontinuation. In addition, given appropriate counseling and provision, women who choose a long-term method may intend to use it for a more sustained duration of time. Injectable discontinuation rates are only slightly lower than for other modern methods and on par with discontinuation of traditional/folkloric methods. However, the composition of discontinuation is different across the three methods, with failure much higher for other modern and traditional/folk and method dissatisfaction higher for injectables.

When discontinuation is disaggregated by specific reasons across all episodes, regardless of length, we find around 4 in 10 discontinuations of each type of LARC were for method-related reasons such as side effects and health concerns. This is more than double that of other modern methods combined. Access and cost were not frequently given as a main reason for the discontinuation of IUDs or implants. However, it was more frequent for injectables, particularly in sub-Saharan Africa. This is an area of concern for a method rising in popularity. Overall, the share of discontinuations to women still in need of contraception ranged from 50 percent for traditional/folk methods to over 70 percent for implant discontinuations.

DWSIN is particularly problematic when it leaves women at risk of an unwanted pregnancy, which was true for 15 to 20 percent of the pooled sample of former LARC users in this study three months after discontinuation. Some level of method dissatisfaction/side effects are to be expected with any method, but high levels of DWSIN can indicate method dissatisfaction and service quality or gaps that put women at risk of an unintended pregnancy. This is somewhat counterbalanced by the low failure rates of LARC methods.

When we modeled the risk of DWSIN by method type across a pooled sample, using country-level random effects and women's characteristics, we found that among injectable and IUD users, women had significantly lower hazards of DWSIN if they started the episode of use after birth, PPA, or LAM. This suggests the importance of postpartum FP efforts designed to help women space births.

The share of IUDs and implants in the national method mix was not significantly related to the hazard of discontinuing either method while still in need. For injectable users, even after controlling for individual characteristics, each percentage point of increased injectable share in the method mix reduced the hazard of DWSIN by 3 percent. However, the relationship did not hold once access was included in the model.

The other two country-level factors considered—access to LARC method and overall quality of FP programs, as measured by FPE scores—significantly reduced the hazard of DWSIN. Access scores are designed to reflect the "extent to which the entire population and ready and easy access" to a specific LARC method. This implies that having sufficient supplies on hand is not enough; counselors and providers should also be trained in that particular method. Quality scores, on the other hand, are a reflection of the entire FP program irrespective of method: full information, wide method choice, counseling, and safe clinical procedures (Ross and Smith 2010). The significant relationship between quality and discontinuation may indicate that users of the particular method have made a better-informed choice of method type and were counseled in-depth on a method's possible side effects. Additionally, because the quality score reflects safe clinical practices, it is conceivable that in countries with higher-quality FP programs, users receive better clinical insertion of their method in such a way that reduces the possibility of failure. Joint models for each LARC method that include access and quality of FP programs found that access remained significant only for one method (implants), but quality remained significant for all three methods. In other words, although method access and programmatic quality are important factors in method continuation, programmatic quality seems to be the more important of the two.

Collectively these models suggest that increasing service readiness and access to LARC methods helps sustain their use. But supplying particular LARC methods is not enough: programs should focus on overall method choice and increasing quality of services. Married women and couples living in countries with broader access to a full range of methods, better counseling to make an appropriate method choice, and safer clinical procedures have lower hazards of discontinuing their LARC method while still in need of contraception. More research on the specific components of programmatic quality that act to sustain use is needed to help focus policy efforts.

Appendix Table A1. List of FP2020 focus countries

The 69 poorest countries in the world by region and sub-region

AFRICA	ASIA
Eastern Africa	**Eastern Asia**
Burundi	Korea, Dem. Rep. of
Comoros	Mongolia
Djibouti	
Eritrea	**Central Asia**
Ethiopia	Kyrgyzstan
Kenya	Tajikistan
Madagascar	Uzbekistan
Malawi	
Mozambique	**South Asia**
Rwanda	Afghanistan
Somalia	Bangladesh
Uganda	Bhutan
Tanzania	India
Zambia	Nepal
Zimbabwe	Pakistan
	Sri Lanka
Middle Africa	
Cameroon	**South-eastern Asia**
Central African Republic	Cambodia
Chad	Indonesia
Congo	Lao People's Dem. Rep.
Dem. Rep. of the Congo	Myanmar
Sao Tome and Principe	Philippines
	Timor-Leste
Southern Africa	Viet Nam
Lesotho	
	Western Asia
Western Africa	Iraq
Benin	Palestinian Territory, Occupied
Burkina Faso	Yemen
Cote d'Ivoire	
Gambia	**LATIN AMERICA & THE CARIBBEAN**
Ghana	**Caribbean**
Guinea	Haiti
Guinea-Bissau	
Liberia	**Central America**
Mali	Honduras
Mauritania	Nicaragua
Niger	
Nigeria	**South America**
Senegal	Bolivia
Sierra Leone	
Togo	**OCEANIA**
	Melanesia
Northern Africa	Papua New Guinea
Egypt	Solomon Islands
Sudan	
Sudan, South	
Western Sahara	

Source: FP2020 (2015).
Note: Countries with 2010 gross national per capita annual income less than or equal to US $2,500.
South Africa made a commitment to FP2020 at the 2013 International Conference on Family Planning but is not a low-income country.

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