

Rising popularity of injectable contraceptives in sub-Saharan Africa

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Abstract

Injectable contraceptives are fast becoming the method of choice among married women in sub-Saharan Africa. In several countries in the region, the proportion of women using injectable methods has surpassed the proportion of women using the pill. This is true even in some countries where the pill had been the most popular modern method in the 1980s and 1990s. This paper analyzes data from six sub-Saharan African countries that have participated four or more times in the Demographic and Health Surveys program to investigate recent increases in prevalence of injectable contraceptives and identify factors that drive the increase. It discusses the programmatic implications of this trend for the region, especially in terms of contraceptive security and sustainability.

Introduction

Although sub-Saharan Africa still has the lowest level of contraceptive prevalence among all the major regions of the world (United Nations, 2011), over the past two decades, the proportion of married women using modern contraceptive methods has increased in almost every country in the region. One of the most noticeable things that have accompanied the rising contraceptive prevalence in many countries in the region is the change in the method mix. Initially, the pill was the main modern method of contraception in most countries in the region. However, in recent years, the use of injectable contraceptives has increased and the rate of increase has been so fast in many countries that they have become the leading method (Lande and Richey, 2006:3). According to a recent estimate by the United Nations (2011), the proportion of married women in sub-Saharan

Africa who used injectables in 2009 (6.8%) was about double the global average (3.5%).

This rapid rate of increase in the use of injectable contraceptives is an exciting programmatic success story because an increasing proportion of African women are finally using a contraceptive method that is highly effective, reversible, convenient to use, and relatively long-lasting (Sullivan *et al.*, 2006, Glasier and Shields, 2006:1). Moreover, these long-lasting injectables have extremely low failure rates – 3% in typical use and 0.3% if used as recommended (Trussell, 2004). And since user-failure is one major reason why so many women who use coitus-dependent methods and methods requiring daily dosage end up with unintended pregnancies, a rapid increase in a method such as injectables will translate to a decline in the proportion of pregnancies that is unintended (Chrisman *et al.*, 2006:125). On the other

hand, this rapid increase in the use of injectables often raises such issues as commodity security, cost, sustainability, and the increasing skewness or lopsidedness in contraceptive method mix.

Injectable contraceptives (or injectables) are given to users by means of intramuscular injection in the upper arm or buttock, and they work by preventing ovulation and by thickening the cervical mucus, making it a barrier to sperm. As commonly used, the failure rates of injectables are less than 1%, compared to 6-8% in pill, 14% for male condoms and 20% for diaphragm (Hatcher *et al.*, 1997, CDC, 1999, Trussell, 2004). There are varieties of injectable contraceptives, and they are usually classified according to the duration of their efficacy: three months, two months, and monthly. The most widely used injectable contraceptives in sub-Saharan Africa, and hence the one this paper focuses on, is the long-acting depot medroxyprogesterone acetate (DMPA) or Depo Provera. One vial of DMPA (150 mg) protects against conception for three months, with two weeks of grace allowed in cases where users are unable to have their shots within three months. An example of two-monthly injectable contraceptives is Norethindrone enanthate (NET EN), which is called Noristerat. This is a progestin-only (or progestogen-only) injectable contraceptive. The third type of injectables is the combined progestin and estrogen, which are given monthly. They include Cyclofem and Mesigyna (Lande and Richey, 2006).

Various studies exist in the literature on injectable contraceptives. A large proportion of these studies focus on their side effects and some focus on

their acceptability and discontinuation rates. Although some of the studies on side effects and discontinuation have found high discontinuation rates among users of injectables, such studies tend to be outside of sub-Saharan Africa. For example, a study of Turkish women found 71% discontinuation rates (Aktun *et al.*, 2005). A study in Egypt found a 12 months discontinuation rate of 70% for injectables (Tolley *et al.*, 2005). Studies in sub-Saharan Africa tend to find lower discontinuation rates for injectables. For example, Ruminjo *et al.* (2005) report a 12 months discontinuation rate of only 25% for Depo Provera. In Ghana, Parr (2003) found that users of injectables tend to use them for relatively long periods. A similar finding was reported by Mitchel and Thistle (2004) in rural Zimbabwe. Scholars have also noted the rising importance of injectables in the contraceptive method mix of several sub-Saharan African countries. An example is the work of Magadi and Curtis (2003) in Kenya. Surprisingly, the literature on a systematic analysis of the patterns, trends and determinants of injectables in sub-Saharan Africa is sparse.

Various studies have also focused on the side effects of injectables. One of them is possible loss of bone mineral density (BMD) among those who use the method for longer than two years. Some studies have found that the effect on bone loss is negligible and reversible (Petitti *et al.*, 2000), some found major effects only among adolescents (see Gold and Bachrach, 2004), while some others found the effect on bone mineral density occurs across all age groups (see Cromer, 1999). To resolve this lack of consistency in findings, the World

Health Organization (WHO) convened a consultative meeting in Geneva in 2005 to review the evidence. The conclusion from that meeting was that DMPA use reduces BMD in women who have attained peak bone mass, but when DMPA use is discontinued, BMD returns over a period of 2-3 years to a level that is comparable to that among non-users. Therefore, WHO recommends that there should be no restriction on the use of DMPA by women between the ages of 18 and 45 who are otherwise eligible to use DMPA.

Thus, the prevalence of injectable contraceptive continues to increase in several countries in sub-Saharan Africa. One of the key questions of interest in this paper is: what are the drivers of the increasing popularity of the injectables in the region? In the section that follows, we piece together some of the explanation that we could garner from the literature and that are relevant to explaining the rising prevalence of injectable contraceptives in sub-Saharan Africa.

Why is the use of injectable contraceptives increasing?

Several levels of explanation could be offered for the rising popularity of injectables in sub-Saharan Africa. They include method-specific advantages that injectables offer; its cultural relevance and convenience, and the issue of secrecy or privacy. For example, in terms of method-specific factors, injectables are highly effective, long-lasting and easily reversible. One dose of DMPA prevents pregnancies for months, which means fewer visits to clinics and freedom from daily dose of pills. Some women consider the absence of the monthly period that

accompanies the use of injectables as a major advantage of the method (Lande and Richey, 2006). Injectables could also be used by breastfeeding mothers and may be appealing to women who are uncomfortable with the estrogen side effects of pills. There is evidence that use of DMPA is associated with significant weight gains in some women (Benson and Rahman, 2009), but we do not know whether or not this side effect might make the method attractive, especially in settings where food insecurity is frequent and where weight-gains are seen as evidence of good living.

Moreover, there are other advantages that are very specific to some injectable contraceptives, although they may not be known to individual users unless providers use the information during counseling. For example, injectables have been found to have some non-contraceptive benefits, such as reduced risks of ectopic pregnancies, symptomatic pelvic inflammatory disease, and uterine fibroids. They increase iron levels in the blood and they are associated with a reduced risk of sickle cell anemia crises, and less painful crises when crises occur (Lande and Richey, 2006). There is evidence that the use of some injectable contraceptives is associated with a reduction in the risk of endometrial cancer (Karmitz, 2001), and it has been observed that women with epilepsy who use Depo Provera may experience less frequent seizures.

In some African countries, preference for injection over pills has been observed (Lohiniva *et al.*, 2005, ADETUNJI, 1996, HODES, 1997). The extent to which this plays a role in the rising

prevalence of injectable contraceptives is unknown. For example, because of the belief in injection, Lohiniva and colleagues found that almost 20% of all prescriptions in their Egypt study included an injection. It has been reported that the popularity of child immunization in a Nigerian community had something to do with its translation as a preventive injection, which synchronizes with the traditional principle of using something to defend against an anticipated but unwanted disease or attack, with the aim of minimizing or eliminating its negative effects (Ade-tunji, 1996). If this same idea is carried over into the use of contraceptive injection, it may be that injectables are considered a 'vaccination' against unwanted pregnancies in the face of exposure to its risks. Hodes (1997) also noted that there is a preference among Ethiopians for injection over pills whenever such an option was available. Available evidence from Demographic and Health Surveys (DHS) shows a rapid increase in the use of injectable contraceptives in Ethiopia. However, the extent to which African preference for injections is widespread is unknown, and it does not explain why injectable contraceptives are not that popular in some African countries.

Beyond cultural preference for injections, there is another set of explanations that revolves around convenience: the notion that women who do not want the constraining regimen of a pill-a-day would find injectables, particularly DMPA, very convenient. DMPA combines high long-lasting effectiveness with reversibility and privacy of use; the injection can be obtained quickly in clinics, and it leaves no traces behind in the

house to be discovered by others. Hence, no-one can tell that a contraceptive is being used. The latter point has much to do with the secrecy hypothesis that some scholars have alluded to as a reason for the rapid increase in the adoption of the method (Phillips *et al.*, 1997, Biddlecom and Fapohunda, 1998).

The secret-use hypothesis posits that many women who use injectables do so because they are able to hide their contraceptive practices from their spouses, and perhaps from other family members who may frown on their use of contraception. Anecdotes abound about African women who come to market with their wares, but stop by clinics, bare their arms, receive their contraceptive injections and go home. There are stories about women who bring their children for immunization or check-up and take their contraceptive injections before going home. Studies are confirming the importance of this secrecy factor in Africa (Phillips *et al.*, 1997, Biddlecom and Fapohunda, 1998, Phillips and Bawah, 2005). The Navrongo project found that a high proportion (92%) of contraceptive users were interested in DMPA mainly because it could be used secretly (Phillips and Bawah, 2005:3). Many DMPA users in Navrongo did not want their partners to know that they were using any contraceptive method. Thus, most women in the area who were not using injectables opted for NORPLANTS, rather than oral pills. So great was the fear of their contraceptive practice being exposed that about 42% of women known to the project as users of contraceptives reported non-use of contraceptives when asked in surveys.

Biddlecom and Fapohunda (1998) in their Zambia study reported that 6-20% of women used contraceptives secretly. Thus, secrecy and privacy could be very important to women whose spouses do not support contraceptive use, or where there are spousal disagreements over the number and timing of pregnancies. The secrecy hypothesis has also been offered as one of the reasons for the cultural acceptability of Depo Provera in many societies (CDC, 1999:350).

In summary, there are method-specific advantages that injectable contraceptives offer its users. There are also cultural relevance, the convenience appeals, and the elements of secrecy. It is likely that the reasons why women choose them would vary from individual to individual, and from setting to setting. Whatever the reason for use, there is some evidence in various DHS reports that the prevalence of injectables is increasing even in rural areas of sub-Saharan Africa. A study in rural Zimbabwe reported high satisfaction among users of DMPA and reported that the method was mainly used for birth spacing (Mitchel and Thistle, 2004). If the method is used mainly by women who want to delay or space births, reversibility will be an advantage, but it may also translate to high discontinuation rates for injectables, although method discontinuation rates are not addressed in this paper.

Data and methods

Data from six sub-Saharan African countries that have participated three or more times in the Demographic and Health Surveys (DHS) program at the time this analysis started in 2006,

whose standard-recode data files were available for download, and where at least 15% of currently married women were using a modern contraceptive method were selected. We set a modern contraceptive prevalence rate of 15% to ensure that we have sufficient number of cases for the analysis. The countries that met these criteria are Ghana, Kenya, Madagascar, Malawi, Tanzania and Zimbabwe. The most recent datasets at the time this analysis began are 2003 Ghana DHS, 2003 Kenya DHS, 2003/4 Madagascar DHS, 2004 Malawi DHS, 2004 Tanzania DHS and 2005 Zimbabwe DHS. Although Tables 1 and 2 have now been updated with information from the latest DHS in these countries, the multivariate analyses are based on the latest surveys at the beginning of the analysis. This is especially necessary because husbands' attitude to family planning, one of the key determinants in our multivariate analysis, is missing from the latest DHS datasets.

Since this paper focuses on trends in the use of injectable methods, the first task is to illustrate the rise or otherwise in their popularity in sub-Saharan Africa. We did this by presenting trends in DMPA relative to other major methods in the contraceptive method mix in a selected number of countries. We calculated the percentage of users of modern contraceptives who are using injectables or the pill, and their trends in each country. We also investigated some of the socio-demographic determinants of the use of injectables using multivariate logistic regression technique. The variables included in the models are women's level of education, rural-urban residence, husband's atti-

tude to family planning, current age, and number of living children. The models were limited to women who are currently married or in unions since the most common indicator of contraceptive prevalence is its use among these women. Therefore, marital status was not included as a variable. In the logistic regression models, women using injectable contraceptives in our sample were coded 1, non-users of injectables were coded zero.

As noted earlier in the paper, one set of explanations revolves around what could be termed the convenience hypothesis: the notion that injectables are long-acting methods and hence require less frequent visits to providers; and that they offer freedom from daily regimen of pills and are not coitus-dependent. They are also offered as injections in settings where women go for other services and by trained professionals. These are conveniences that may make the method very appealing to women with low levels of education and those in rural areas. Therefore, the prevalence of injectables use was presented by rural urban residence and the trend over time is assessed to see if the use of injectables increased faster in rural areas and among women with low education. We expected injectables to rise fast in rural areas where attitudes

to family limitation may be negative, where husband-wife communication about family planning may be uncommon, where men's family size ideals may be higher than the woman's, and where gossip and other forms of diffused sanction may make privacy highly desirable to users of contraceptives (Ntozi and Kabera, 1991).

This brings us to the secret use hypothesis which has dotted the literature in one form or another (Rutenberg and Watkins, 1996, Phillips *et al.*, 1997, Biddlecom and Fapohunda, 1998). We tested this hypothesis by using data from DHS couple data files that are available from the countries.

Findings

A. Levels and Trends

Table 1 shows the levels and trends in the use of major modern contraceptive methods. The results indicate an increasing prevalence of modern methods in general, and a particularly rapid increase in the use of injectables. For example, in Malawi, between 1992 and 2010, the prevalence of modern methods among married women increased sixfold (from 7 to 42%). However, the prevalence of injectable contraceptives increased about seventeenfold – rising from a low of 1.5% to 26%.

Table 1 The percentage of married women using selected contraceptive methods in six sub-Saharan African countries

	Any Modern	Pill	Injectable	Condom	IUD	Fem. Sterilzn
Ghana						
1988	4.2	1.8	0.3	0.3	0.5	1.0
1993	10.1	3.2	1.6	2.2	0.9	0.9
1998	13.3	3.9	3.1	2.7	0.7	1.3
2003	18.7	5.5	5.4	3.1	0.9	1.9
2008	16.6	4.7	6.2	2.4	0.2	1.6
Kenya						
1989	17.9	5.2	3.3	0.5	3.7	4.7
1993	27.3	9.5	7.2	0.8	4.2	5.5
1998	31.5	8.5	11.8	1.3	2.7	6.2
2003	31.5	7.5	14.3	1.2	2.4	4.3
2008/9	39.4	7.2	21.6	1.8	1.6	4.8
Madagascar						
1992	5.1	1.4	1.6	0.5	0.5	0.9
1997	9.7	2.4	4.7	0.7	0.5	1.0
2003/4	18.3	3.4	10.2	1.0	0.6	1.1
2008/9	29.2	6.0	17.9	1.1	0.4	1.1
Malawi						
1992	7.4	2.2	1.5	1.6	0.3	1.7
2000	26.1	2.7	16.4	1.6	0.1	4.7
2004	28.1	2.0	18.0	1.8	0.1	5.8
2010	42.2	2.5	25.8	2.5	0.3	9.7
Tanzania						
1992	6.6	3.4	0.4	0.7	0.4	1.6
1996	13.3	5.5	4.5	0.8	0.6	1.9
1999	16.9	5.3	6.3	2.7	0.4	2.0
2004	20.0	5.9	8.3	2.0	0.2	2.6
2010	27.4	6.7	10.6	2.3	0.6	3.5
Zimbabwe						
1988	36.1	31.0	0.3	1.2	1.1	2.3
1994	42.2	33.1	3.2	2.3	1.0	2.3
1999	50.4	35.5	8.1	1.8	0.9	2.6
2005/6	58.4	43.0	9.9	1.4	0.3	2.0

Source: Analysis of DHS data from STATcompiler

In Kenya, the percentage of women using injectables increased from 3.3% in 1989 to 21.6% in 2008 – a sevenfold increase – while the percentage of women using the pills increased from 5.2% to 7.5% over the same period. Even between 1998 and 2003 when overall modern CPR stagnated in Kenya, the prevalence of injectables still increased by 21%. In 1989, the percentage of women using the pills was 57% higher than the percentage using injectables, but by 2008, the proportion of women using injectables was triple the percentage using the pills. In Madagascar, the percentage of married women using injectables increased from 1.6% in 1992 to 17.9% in 2008/9 – an elevenfold increase.

In Tanzania, while modern CPR increased from 6% to about 27.4% between 1992 and 2010 and the prevalence of pills doubled (from 3.4% to 6.7%), the prevalence of injectables increased steeply from a low of 0.4% to about 10.6%. In Ghana, although the pill was the leading modern method used between 1988 and 1998, by 2008, the prevalence of injectables had surpassed that of pills. Zimbabwe is one of the few countries in the region where the pill continues to be the dominant method of contraception among married women. Between 1988 and 2005/6, the percentage of married women using the pills increased from 36% to 58%. Even then, pill users as a percentage of women using modern contraceptives decreased from 86% in 1988 to 74% in 2005/6. Within the same period, the percentage using the injectable method rose dramatically from less than 1% to about 10%. However, although the percentage using injecta-

bles is still small in comparison with those using the pill, its relative size in the method mix has increased from less than 1% in 1988 to 17% in 2005/6.

In Table 2, the relative contributions of pills and injectables to the modern method mix are presented. The results show a general rapid increase in the percentage of injectable users in the modern method mix and a relative decrease in the percentage of pill users. For example in Ghana, only 7% of married women who were using modern contraceptive methods reported injectables in 1988. By 2008, the percentage reporting injectables had increased to 37%. However, whereas 43% of married women who were using modern contraceptives in Ghana in 1988 relied on the pills, by 2008, that percentage had declined to 28%. Similarly, in Malawi, only 20% of married women using modern contraceptives reported injectables as their current method in 1992, but by 2010, that percentage had increased to 61%. Within the same period, the percentage of modern contraceptive users reporting the use of the pill declined from 30% to 6%.

In Kenya, between 1989 and 2008/09, the percentage of injectables users among married women using modern contraceptive methods increased from 18% to 55%, whereas the percentage that depended on pills decreased from 29% to 18% (Table 2). In Madagascar, 31% of modern contraceptive users reported the use of injectables, but by 2003/4, that percentage had increased to 56%. In Tanzania, only 6% of modern method users were using injectables in 1992. By 2010, that percentage had increased to 39% while the percentage of contraceptive users that used pills decreased from 52% to 25%.

Table 2 Percentage of women currently using a modern contraceptive method who reported the use of pills or injectables

	CPR (All modern methods)	Pill users as % of modern CPR	Injectable users as % of modern CPR
Ghana			
1988	100	42.9	7.1
1993	100	31.7	15.8
1998	100	29.3	23.3
2003	100	29.4	28.9
2008	100	28.3	37.3
Kenya			
1989	100	29.1	18.4
1993	100	34.8	26.4
1998	100	27.0	37.5
2003	100	23.8	45.4
2008/9	100	18.3	54.8
Madagascar			
1992	100	27.5	31.3
1997	100	24.7	48.5
2003/4	100	18.6	55.7
2008/9	100	20.5	61.3
Malawi			
1992	100	29.7	20.3
2000	100	10.3	62.8
2004	100	7.1	64.1
2010	100	5.9	61.1
Tanzania			
1992	100	51.5	6.1
1996	100	41.4	33.8
1999	100	31.4	37.3
2004	100	29.5	41.5
2010	100	24.5	38.7
Zimbabwe			
1988	100	85.9	0.8
1994	100	78.4	7.6
1999	100	70.4	16.1
2005/6	100	73.6	17.0

Notes: Calculations based on information in DHS datasets and final reports.
CPR is modern contraceptive prevalence rates.

Table 3 Multivariate logistic regression analysis of the determinants (odds ratios) for the use and non-use of injectables

Variables	Ghana	Kenya	Malawi	Madagascar	Tanzania	Zimbabwe
Place of residence						
Rural	1:00	1.00	1.00**	1.00	1.00***	1.00
Urban	1.18	1.12	1.55	0.85	2.84	0.97
Education						
None	1.00	1.00***	1.00	1.00***	1.00	1.00
Primary	1.21	3.56	1.05	2.29	1.61	0.91
Secondary/+	1.04	4.12	1.47	2.64	1.45	1.11
Husband's attitude to family planning						
Negative	1.00**	1.00***	1.00***	1.00***	1.00***	1.00***
Positive	3.82	3.19	6.55	26.32	3.65	3.16
Age						
15-19	1.00*	1.00***	1.00***	1.00	1.00*	1.00
20-24	3.77	1.41	1.51	1.15	1.92	1.23
25-29	4.04	1.52	1.14	1.32	1.49	1.70
30-34	3.58	1.22	0.65	1.20	0.93	1.88
35-39	2.49	0.93	0.43	1.18	0.88	1.63
40-44	2.53	0.88	0.35	1.11	1.51	1.15
45-49	1.22	0.35	0.30	0.72	0.53	0.93
No. of living children						
0-1	1.00***	1.00***	1.00***	1.00***	1.00***	1.00***
2	2.63	1.93	2.27	2.18	2.44	1.62
3	2.63	2.43	3.62	1.94	1.72	3.19
4	2.83	2.68	4.75	2.27	2.80	3.34
5+	2.96	2.24	7.92	2.59	4.04	4.63
Constant	-5.951 (0.990)	-4.650 (0.315)	-4.609 (0.172)	-6.278 (0.67)	-5.229 (0.518)	-4.688 (0.427)

Notes: Asterisks (*) denote the level of statistical significance: * ($p < 0.05$), ** ($p < 0.01$), *** ($p < 0.001$). Analysis is based on data from 2003 Ghana DHS, 2003 Kenya DHS, 2003/4 Madagascar DHS, 2004/5 Malawi DHS, 2004 Tanzania DHS and 2005/6 Zimbabwe DHS.

Table 1 Current contraceptive methods reported by men and women in matched couple's files for selected countries in sub-Saharan Africa

Method	Ghana		Kenya		Madagascar		Malawi		Tanzania		Zimbabwe	
	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male*	Female (%)	Male (%)
Pill	6.1	7.4	7.5	9.2	4.0	4.7	3.3	3.8	7.3	7.2	38.6	46.0
IUD	1.1	0.5	2.6	2.2	0.5	0.5	0.1	0.1	0.2	0.3	0.7	0.1
Injections	5.9	4.7	16.1	10.1	12.1	11.0	15.9	11.7	9.8	8.3	9.1	7.6
Condom	2.5	6.8	0.7	3.0	1.1	2.6	1.4	5.9	1.3	7.4	1.8	5.3
Fem Sterilization	2.3	1.3	4.1	3.4	1.2	1.2	4.8	4.8	1.9	1.2	2.7	2.0
None	73.3	64.5	60.0	46.8	69.2	64.8	69.5	68.9	73.3	62.9	43.6	33.6

Note: * Questions asked from men was about their most recent method used

B. Socio-demographic determinants

Adjusted odds ratios from a set of multivariate regression models for selected determinants of use or non-use of injectables are presented in Table 3. They show that only two variables (number of living children and husband's attitude to family planning) were statistically significant correlates of injectable use in all countries in the table. Women who have two or more children were much more likely to use injectables than women with one or no children. In most countries, the odds ratios for using injectables were highest for women with 5+ living children. The odds ratio was about 8:1 in Malawi, about 5:1 in Zimbabwe and about 4: 1 in Tanzania.

Similarly, wives were much more likely to be using injectables if their husbands had positive attitudes to family planning. The odds ratio was at 26:1 in Madagascar and about 7:1 in Malawi. In the other four countries, they are about 3 or 4 to 1. The age of women at the time of interview was a statistically significant predictor of injectables use in four of the six countries (Kenya, Malawi, Ghana and Tanzania). In most of these countries, use of injectables peaked among women in ages 20-29. Women's level of education and place of residence were statistically significant only in Malawi and Tanzania. In each of these countries, the prevalence of injectables was higher in urban areas and increased with women's level of education. It is interesting that in Zimbabwe where the pill is the dominant method, only the husband's attitude to family planning and number of living children are statistically significant as predictors of injectable use.

Although the analysis of determinants offer useful insights into the background factors that are associated with the use of injectables in these countries, it does not really tell us much about why the rate of increase is very rapid in many African countries. It therefore seems logical for us to look at the hypotheses that may offer insights.

C. The secret use hypothesis

As already indicated, it has been hypothesized that one attraction of injectable contraceptives is that women could hide their use from non-cooperative spouses or other household members. The question is whether we have evidence that supports the hypothesis. To investigate this question, we analyzed data from matched couple's files in the latest DHS in each country. We wanted to see the extent of agreement or disagreement between spouses in their reported current contraceptive methods. The results are presented in Table 4 and they show that men tend to slightly over-report their wives' use of pills – over-reporting by about 20% in Ghana and Zimbabwe. The biggest divergence in reporting was in injectables and condoms. The percentage of men who reported injectables as current contraceptive method is generally lower than the percentage of their spouses who reported using injectables. In Kenya for example, the proportion of women who reported pills as their current method was about the same as the proportion of men who reported the method. However, the proportion of women who reported injectables (which is likely to approximate reality)

was 59% higher than the proportion of men in the couples' file reporting the method. The proportion was 36% higher in Malawi and 25% higher in Ghana. In terms of agreement in the reported use of the pills, the results suggest that men generally tend to overestimate the proportion of their spouses using the pill. Similarly, women tend to under-estimate the proportion of their spouses using condoms.

Although a lack of correspondence in couple's reported current method of contraception could be interpreted as evidence that some men do not know that their spouses are using injectables, it should be realized that this approach to testing the secrecy hypothesis may be flawed especially in settings where polygyny or concurrent partnership is common. One of the ways to check whether wives were secretly using injectables is to look at the proportion of women using injectables but who were reported by their husbands as not using any method. The results (not presented) shows that in Ghana, 25% of women who reported injectables as their current method were reported as using no method by their spouses. That seems to be a better indicator of secret use. The percentage of women who seem to use the injectables secretly was similar in Malawi (27%), but was lower in Kenya (15%) and in Zimbabwe (5%). In Zimbabwe, 30% of men whose spouses were using injectables reported them as using the pill. Most husbands know that their wives were using some contraceptive method, even if they don't know which one.

D. The convenience hypothesis

Apart from offering privacy convenience is another major advantage of injectable contraceptives. Certain aspects of this convenience advantage may work in the interest of rural women and those with low levels of education. For instance, it is likely that the increase in the use of injectables will be more rapid in rural areas where service delivery points may be sparse and difficult to access, where traditional attitudes to the use of modern family planning methods may prevail, where maintaining daily regimen of the pills may be less appealing, and where atti-

tudes of husbands to the use of family planning methods may be more conservative. If this is true, we would expect the uptake of the injectables to be more rapid in rural than urban areas. However, people in rural areas tend to be more traditional and superstitious in outlook than those in urban areas. Thus, fear of side effects may actually scare users away from continuing to use injectable methods. Since service provision in rural areas may be less reliable than in urban areas, it is often difficult to separate lack of access from lack of interest.

Table 1 Rural-urban trends in the percentage of married women using injectable contraceptives

	Survey 1 (%)	Survey 2 (%)	Survey 3 (%)	Latest (%)	Ratio Latest/First survey
Ghana					
Rural	0.2	1.4	2.8	6.3	31.0
Urban	0.3	2.0	3.8	6.2	21.0
Kenya					
Rural	3.4	7.4	11.6	21.0	6.2
Urban	2.8	6.2	12.6	23.5	8.4
Madagascar					
Rural	1.4	3.4	9.7	17.9	12.8
Urban	2.6	8.3	11.9	18.1	7.0
Malawi					
Rural	1.4	15.3	17.1	25.5	18.2
Urban	2.2	22.9	22.5	27.2	12.4
Tanzania					
Rural	0.2	3.1	6.9	9.4	47.0
Urban	1.2	9.5	12.6	14.3	11.9
Zimbabwe					
Rural	0.2	3.0	8.3	9.2	46.0
Urban	0.5	3.6	7.6	11.2	22.4

To examine the rural convenience hypothesis, we look at rural and urban distribution of users of injectables and the trend (see Table 5). The results show that in almost every country in this study, the use of injectable contraceptives increased over time in both rural and urban areas. However, with the exception of Kenya where the prevalence of injectable in the first survey was higher in rural than in urban area, the prevalence of injectables increased much faster in rural areas than in urban areas. The rural area with the fastest increase in the prevalence of injectables was in Tanzania: the ratio of prevalence in the latest to first DHS was 47:1, while it was 12:1 in urban areas. Similarly in Zimbabwe, latest to first ratio in the prevalence of injectables was 46:1 in rural areas compared to 22:1 in urban areas. In Ghana, the prevalence of injectables in the latest DHS was 31

times that in the first survey in rural areas and 21 times in urban areas. In Malawi, rural prevalence of injectable grew by a factor of 18, but by 12 in urban areas. In Madagascar, the corresponding numbers are 13 in rural areas and 7 in urban areas.

In sum, the results show a narrowing of urban-rural gap over time in a majority of the countries in this analysis. The conclusion from Table 5 is that uptake of injectables has grown much faster in rural areas. Given that urban areas have higher density of health facilities and health care providers, and more educated and well-to-do people, and are hence more resourced to provide easier access to injectables, its faster growth in adoption in rural areas suggest that the convenience hypothesis may indeed be true and perhaps indirectly the secrecy hypothesis has some support.

Table 5 Preferred methods for future use among women who are currently not using any methods but intend to use in future (column %)

Method	Ghana	Kenya	Malawi	Tanzania	Zimbabwe
Pill	15.4	13.0	17.9	25.9	56.8
IUD	3.4	1.4	1.4	1.9	1.6
Injection	42.5	46.6	59.2	45.6	26.5
Implants	11.1	7.2	1.4	3.1	1.8
Condom	2.9	1.3	4.9	2.7	1.2
Fem Steriliz	3.6	7.9	9.9	8.1	4.7
Unsure	12.5	15.3	1.6	5.2	2.7
Total*	100.0	100.0	100.0	100.0	100.0

* Total will not add to 100 because some minor methods are omitted from the table.

What will the future look like for injectables?

Although future pattern of contraceptive use may not be easy to predict, a simple way to anticipate trends in

demand for contraceptive methods is to look at the preferred methods for future use among women who are current non-users of contraception but who intend to use a method in the

future. This is the focus of Table 6, and it shows that the pill would continue to dominate the contraceptive method mix in Zimbabwe in the near future. However, for the other countries in the table, users of injectables and implants would dominate the contraceptive scenes. For example in Kenya, the proportion of non-users of contraception who intend to use the injectables and implants (54%) is four times the proportion intending to use the pill (13%). In Ghana, the proportion of potential users of injectables and implants is three and a half times the proportion intending to use the pill, and in Malawi, it is more than three times. If you put this side by side with the US, the picture is quite interesting. In spite of the fact that the method is reversible, highly effective and convenient, it seems that their acceptance rate in the US remains very low (Tanfer *et al.*, 2000). Only 3% of women at risk of unintended pregnancy were using the injectables in 1995.

Discussions

So far in this paper, we have shown that injectable contraceptive methods are fast becoming the method of choice among married women in several sub-Saharan African countries. The fastest increases are in Zimbabwe with 33-fold increase in about 15 years, Tanzania with 27-fold increase in 18 years, and Malawi with seventeen-fold increase also in 18 years. There are many programmatic implications of the rising prevalence of injectables in sub-Saharan Africa. One is how to pay the cost of purchasing contraceptive commodities and supplies, which are increasing every year. Injectables are not the least

expensive of longer-acting reversible methods. Available data from USAID Office of Population indicate that one couple year of protection (CYP) for DMPA costs about \$4.32 without counting the cost of service delivery. This is 32% higher than the cost of one CYP for pills and 9 times the cost of one CYP of intrauterine device (IUD). More and more of these injectables need to be procured every year. Between 2003 and 2005, shipments of doses of injectables by the United Nations Population Fund, USAID and the International Planned Parenthood Federation – the three largest donors of contraceptive commodities – more than doubled from 23 to 48 million doses per year (Lande and Richey, 2006:4). This demand is projected to increase to 150 million doses per year by 2010.

Even if there is contraceptive security, there is the second challenge of making it available to clients even in the remote villages of Africa. The cost issue is especially important because a large percentage of the commodity that underpins this rising prevalence is heavily subsidized by donors and is made available free to almost all users, with limited contributions from host-country government even for commodities in public facilities. The extent to which injectables will continue to be popular without this donor support is unknown. However in Malawi, there was an experience that might be illustrative: an attempt to introduce user-pay system by one of the leading private sector providers services – Banja La Msogolo – led to a drop in the number of clients from about 175,000 in 1999 to about 94,000 in 2001. When subsidized serv-

ices were re-instated in 2002, the number of clients in its clinics increased to about 136,000 in 2002 and 350,000 in 2003 (Solo *et al*, 2005).

Finally, although the rising prevalence of injectable contraceptives has helped many families avoid unintended pregnancies, it is also important to be cognizant of the fact that this increase in happening in some countries where HIV prevalence is also high. Therefore, it is important for family planning service providers to remind women that injectable contraceptives, like all non-barrier methods, do not protect against sexually transmitted diseases, including HIV. WHO encourages women and men to use dual protection approaches whenever there is any possibility of exposure to STI and HIV (WHO, 2004, 2005).

Summary and conclusion

In this paper, data from selected countries in sub-Saharan Africa have been analyzed to illustrate the rising popularity of injectable contraceptives. The results of the analysis show clearly that injectables have become the leading modern contraceptive method in several countries in sub-Saharan Africa. Their relative size in the contraceptive method mix is increasing rapidly in every country in this study and they are popular in both urban and rural areas in the region. However, the rate of increase in the prevalence of injectables tends to be higher in rural than urban areas in almost all countries here, thus suggesting that convenience may be part of the reason for the popularity. There is also some support for the secrecy factor, although most men are aware that their spouses were using

some form of contraception even if they do not know which one it is. Looking at future trends in the countries studied, there is evidence that the popularity of injectable will continue to increase, all things being equal. The implication of this rising popularity of injectables is discussed in the light of cost and sustainability of family planning program, particularly in resource-poor settings, and in the context of HIV/AIDS and of possible long-term effects.

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