

## ORIGINAL RESEARCH ARTICLE

# Increased Use of Injectable Contraception in Sub-Saharan Africa

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## Abstract

National surveys show a remarkable upsurge in the use of injectable contraceptives in east and South Africa, in contrast to central and West Africa and certain other regions. Data are analyzed here from 95 surveys conducted since 1980 in 38 sub-Saharan African countries, to determine past injectable trends in the context of alternative methods and to explore related issues. In eastern and southern countries injectable use has risen to about 15%-20% of married women, equaling about 40% of all contraceptive use, with some countries above that. Increases in total use have followed increases in injectable use; that and other evidence is clear that the injectable has not merely substituted for the use of pre-existing methods but has given a net increase to total use. Rural use patterns are not much different from urban ones; however the middle and higher wealth quintiles have especially moved toward injectable use. In west and central countries traditional methods are still paramount, with modern methods increasing slightly, but total use remains quite low there. So far no plateau has appeared in total injectable use, though one may be emerging in its share of all use as other methods also increase. Most use is supplied through the public sector, which raises long term cost issues for health ministries and donors. Many sexually active, unmarried women use the method. Discontinuation rates are quite high, and alternative methods need to be kept readily available (*Afr J Reprod Health 2012; 16[4]: 68-80*).

## Résumé

Les enquêtes nationales montrent un essor remarquable dans l'utilisation des contraceptifs injectables en Afrique de l'est et en Afrique du Sud, contrairement à l'Afrique Centrale et de l'Ouest et dans certaines autres régions. Les données sont analysées ici à partir de 95 enquêtes menées depuis 1980 dans 38 pays d'Afrique subsaharienne, afin de déterminer les tendances d'injectables dans le contexte des méthodes alternatives et d'explorer les questions qui s'y lient. Dans les pays de l'Est et du Sud de l'utilisation des injectables a augmenté d'environ 15% à 20% chez les femmes mariées, ce qui représente environ 40% de toutes les utilisations des contraceptifs, certains pays ayant des chiffres supérieurs à cela. Les augmentations de la consommation totale ont suivi l'augmentation à l'égard de l'utilisation des injectables; cela et d'autres preuves; montrent clairement que l'injectable n'a pas seulement remplacé l'utilisation de méthodes existantes, mais a causé une augmentation nette de la consommation totale. Les tendances dans l'utilisation rurale ne sont pas très différentes de celles en milieu urbain; néanmoins, les quintiles de richesse moyennes et supérieures se sont surtout orientés vers une utilisation des injectables. Dans les pays de l'Ouest et du Centre les méthodes traditionnelles sont toujours primordiales, les méthodes modernes étant en légère augmentation, mais l'utilisation totale reste assez faible là-bas. Jusqu'à présent, aucun plateau n'est apparu dans l'utilisation totale à injectable, quoiqu'il puisse figurer de sa part dans toute l'utilisation au fur et à mesure que d'autres méthodes aussi augmentent. La plupart des injectables proviennent du secteur public, ce qui soulève des questions à long terme concernant le coût pour les ministères de la santé et les donateurs. Beaucoup de femmes non mariées qui sont sexuellement actives, les femmes non mariées utilisent cette méthode. Les taux d'abandon de cette méthode sont très élevés, et les méthodes alternatives doivent être facilement disponibles. (*Afr J Reprod Health 2012; 16[4]: 68-80*).

**Keywords:** Contraception, injectable, Sub-Saharan Africa, discontinuation, time trends, private sector; method mix

## Introduction

When a single contraceptive method emerges, in a relatively short time, to become the dominant choice among users, with a corresponding increase in overall contraception, something remarkable

has occurred in reproductive health behavior. In the late 1990s, national surveys started to show notable increases in injectable use in east and southern sub-Saharan Africa. Here are early percentages of married/cohabiting women using the method:

Malawi	17% by 2000
Lesotho	14% by 2000
Kenya	13% by 1998
Namibia	13% by 1989
Swaziland	12% by 2000
Botswana	10% by 2000
Zimbabwe	9% by 1999

South Africa registered 14% by 1981 and rose to 26% by 1994, then the highest level recorded.

These early surveys caught the world's attention, and interest was high in the surveys to follow, which confirmed that something special was underway. The surprising emergence of the injectable gave hope that explicit demand for contraception existed among women in the east and south and that they would act on it, given a suitable method with ready access.

The following sections trace the rise of the injectable method, its growing share of all use, and its place among the other methods, in both rural and urban areas. The contrasts between the east/south countries and those in the west/central regions are highlighted. The sources of supply are considered, along with the high discontinuation rates among injectable users.

## Methods

National survey information is employed throughout to trace time trends and compare contraceptive options, with some attention to regional and residential differences. Most surveys are drawn from the Demographic and Health (DHS) series; these come from the StatCompiler software of Macro International<sup>1</sup>. Additional surveys are taken from the extensive compilation of the United Nations Population Division<sup>2</sup>. Statistical methods employed include regressions between injectable use and the use of other contraceptives.

## Results

### Injectable Trends by Country

Past surveys trace the percentage of married/in union women aged 15-49 who use each contraceptive method. Figures 1A and 1B display

the trends, identifying each country with the date of the latest survey.

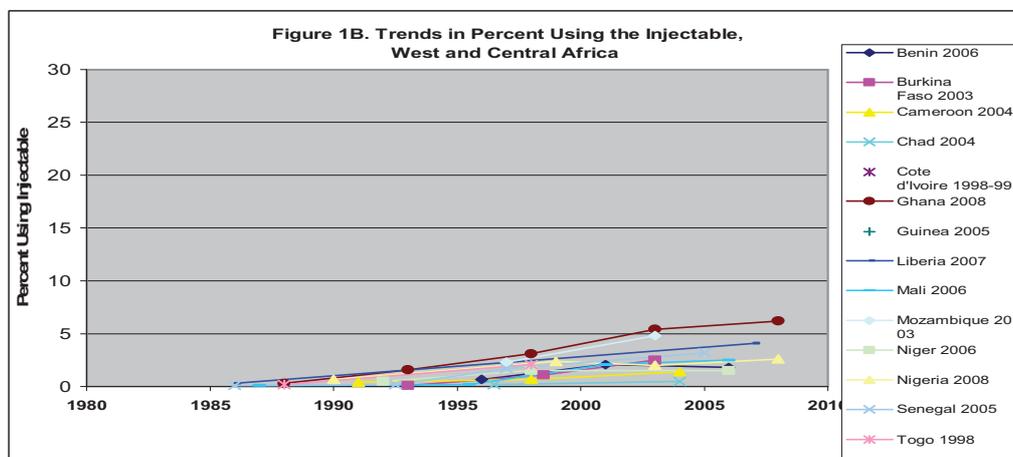
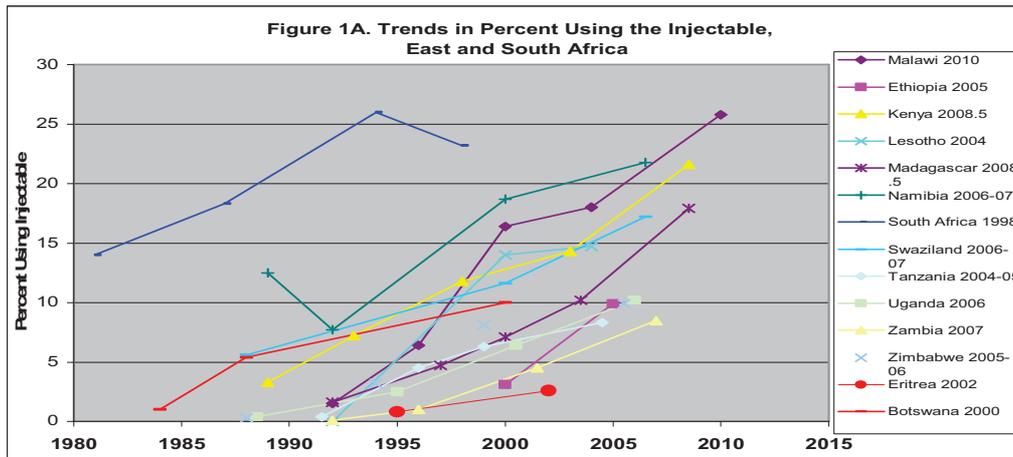
By the early 1990s the injectable curves were well started (above). During the 15 years since they have risen steadily. Most east/southern countries range well above 10% using the method. Equally notable is the lack of any plateauing; the lines continue sharply upward in the latest surveys, and no evidence of ceiling effects has so far emerged. Only South Africa, at the top, is off, but others are approaching its level without any sign of flagging. Without any other plateaus appearing, additional increases are to be expected.

However, while the injectable has taken off in the east and south, the picture is entirely different elsewhere. In the west and central countries injectable use, along with all use, is at a far lower level. Nearly all west/central countries fall below the line for 5% using the method (although the curves are slightly up).

### The Injectable's Share of All Use

The contraceptive prevalence rate (CPR) serves as a measure of total use among married/in union women aged 15-49. As a share of the CPR the injectable has been accounting for an increasing proportion (Figures 2A and 2B, which again show each country dated by the most recent survey). Most curves are continuing to rise including the high ones for Kenya and Madagascar at about 45%. That makes the question of plateauing for shares unclear: several countries have leveled off at 40% and Malawi has leveled off at the peak share of over 55%. This is a separate question from that for plateauing in Figures 1A and 1B for the percentage of women using the injectable: no plateauing has emerged there. In the case of shares it is a balance between the pace of growth in the injectable vs. the pace of growth for all use. The middle level at 40% has actually occurred while both components have been growing.

In the west and central group the trends for the injectable's share are uniformly up. That occurs because the injectable's pace of increase is faster than the pace for all use. The injectable is stealing share from the other methods, while all have been rising within a low range. This dynamic will be important to watch as additional surveys appear.



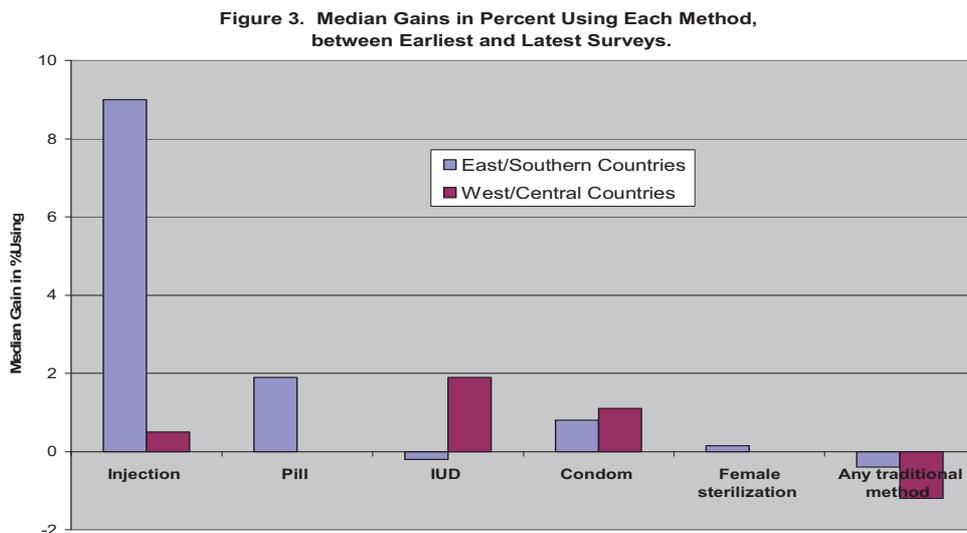
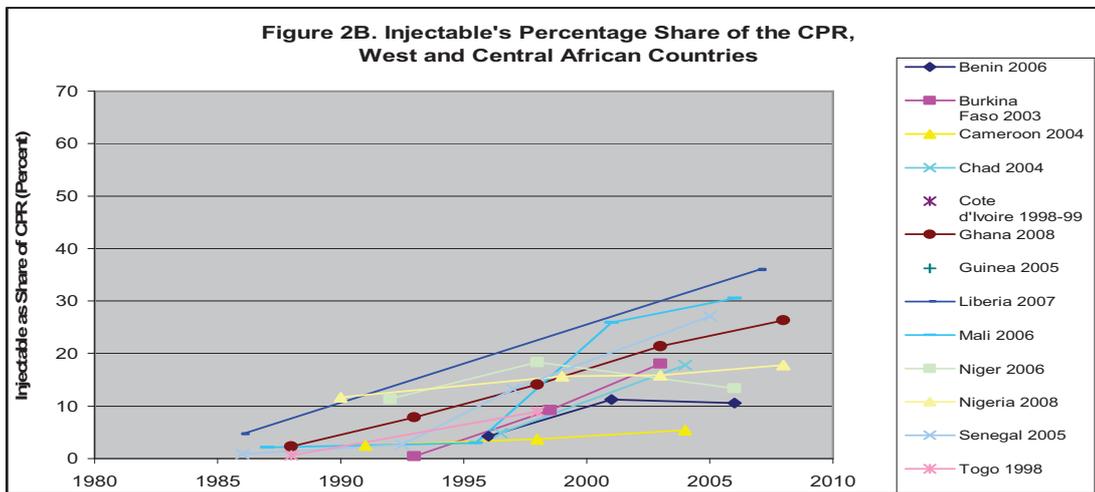
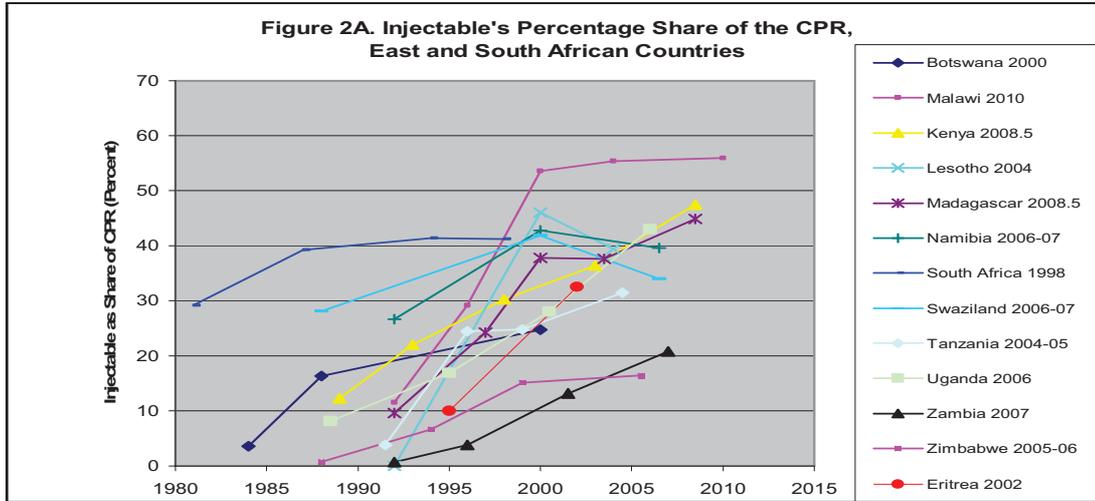
**Past Gains in Use, by Method, East and South Group**

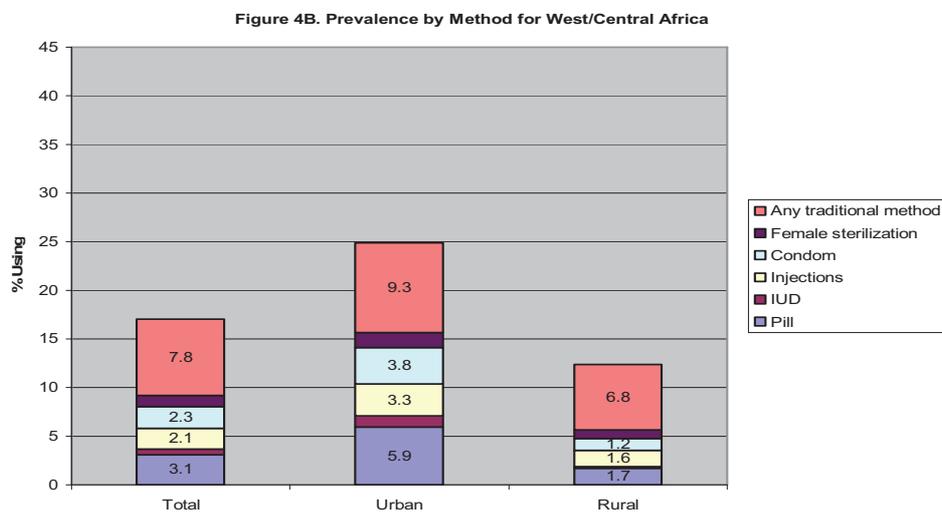
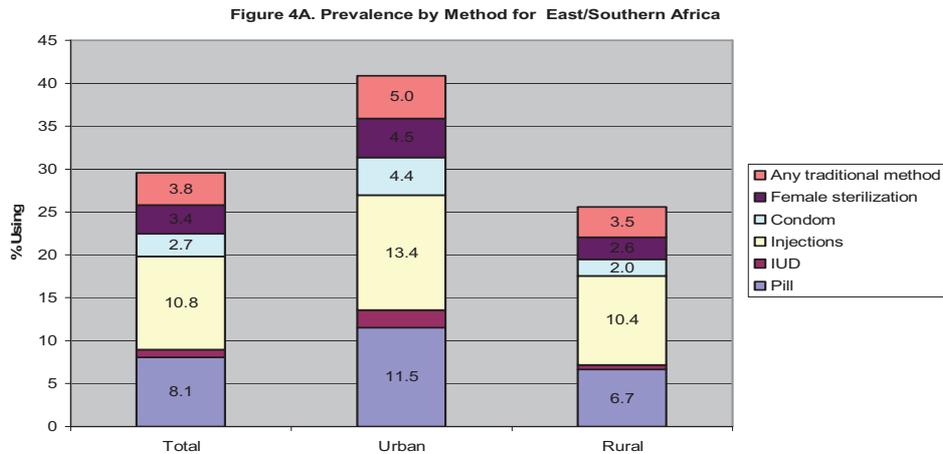
By measuring use between the earliest and latest surveys for each country we can rank contraceptive methods according to their past gains in use (Figure 3). The injectable has by far outpaced the other methods in the east and southern countries, growing by 9% on average<sup>3</sup>. Gains in the other methods have all been below 2%. The injectable's gain was four times greater than that of the pill (2.7%) and much faster than the condom (1.7%), female sterilization (0.8%), the IUD (-0.4%), or traditional methods (-0.4%).

All gains in the west and central group have been slight, below 2%; in fact the gain there was nil for the pill and female sterilization. Notably, traditional methods have declined slightly in both regions as the use of modern methods has risen.

**Substitution:** The disproportionate rise in the injectable in the east and south speaks to the question of whether it has merely substituted for other methods. In the east and south, there has been a notable rise in total contraceptive use during the period in which injectable use has increased so sharply. A brief summary of the increase in total use is obtained by comparing the levels between the earliest and most recent surveys. In the group of 14 east and southern countries the median use level rose by 15%, starting from 18%, over an average period of 12 years. In the group of 15 west and central countries the picture differed: a median rise of only 3%, starting from 12%, over the same period.

Considering the east and south only, had total use remained flat, or risen less than the rise in the injectable, a replacement or substitution effect would be plausible, but the increases in the





injectable and in total use have moved together, while each other method has contributed rather little. We cannot reconstruct history to see what the other methods would have done in the absence of the injectable, but the information on past trends strongly suggests a net gain in total use from the injectable in the east and south group of countries. The advent of the injectable has yielded a considerable net gain; its intrinsic features, together with distribution systems that have reached large segments of the population including the rural sector (below), have helped to satisfy some latent demand. The importance of contraceptive technology, as well as that of large-scale supply and information systems, is reflected in this experience.

### Correlations between Total Use and Injectable Use

An additional way to explore the substitution question and the dependence of increases in total contraceptive use upon increases in injectable use, is by cross-country correlations. Employing the latest surveys, and taking total contraceptive use as the dependent variable and injectable use as the independent, or driving, variable, the correlation is high in East/Southern Africa for use of all methods (0.62) as well as for use of modern methods only (0.59). A higher percentage using the injectable means a higher percentage for total use. The slopes are also impressive: a ten point increase in injectable use is associated with an 18 point

Figure 5A. Method Mix for East/Southern Africa

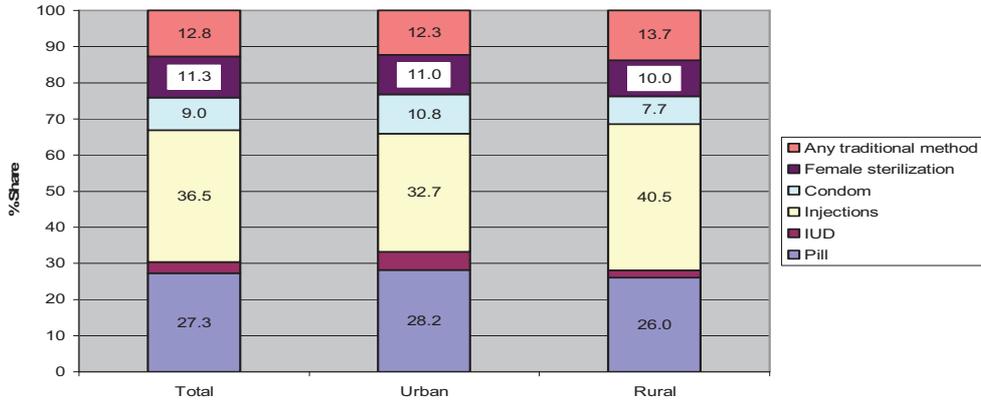


Figure 5B. Method Mix for West/Central Africa

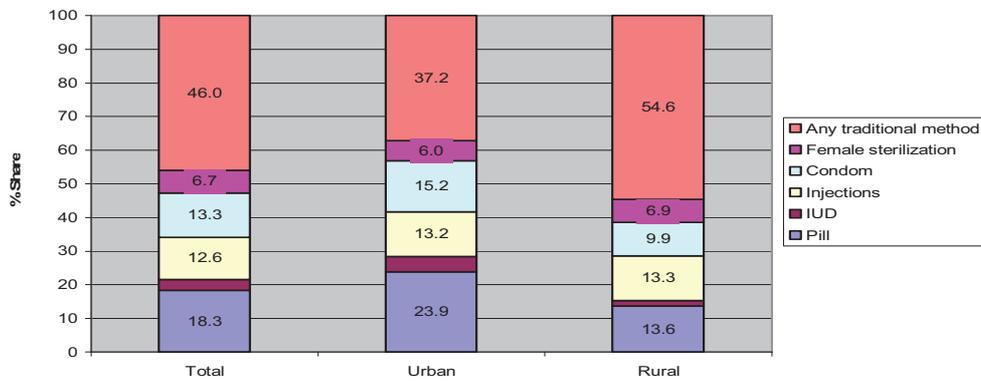
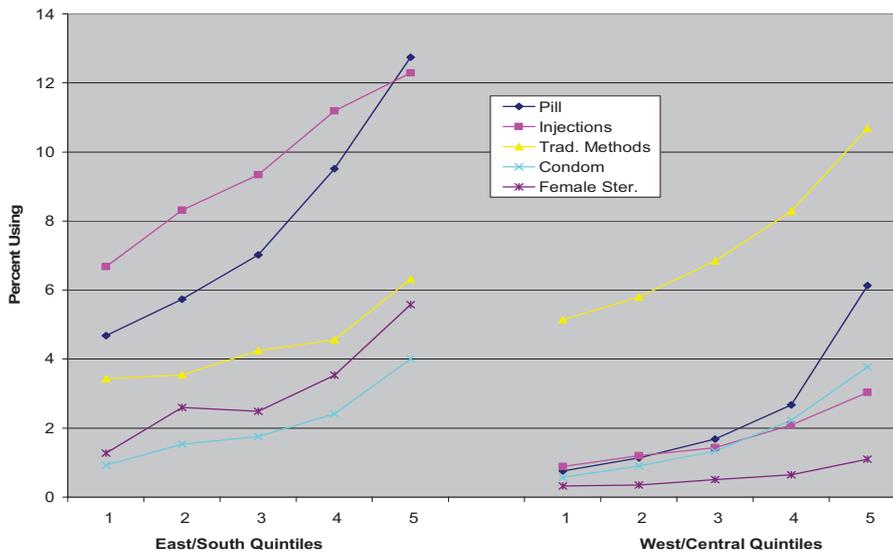


Figure 6. Differential Use of Methods by Wealth Index



increase in total or modern use. Since the 18 point increase exceeds the 10 point increase it is clear that the net increase in use of other methods has also contributed (Table 1).

However in West/Central Africa the results differ sharply. Total use has no relation to injectable use (0.04), partly because traditional methods dominate use there, with a scattering of modern methods at low levels. The slope comes out as negative, due to the very small role played by the injectable and the very large role played by traditional methods. Note that when they are removed and the focus is just on modern use, the correlation rises considerably (to 0.18) and the slope becomes positive: a ten point rise in the injectable is associated with an 11 point rise overall, so again, other methods assist slightly. Nevertheless all of the values for modern methods are crowded down into a small range near zero so the correlations cannot be very large in competition with randomness and non-measurement errors.

**Method Differences in Use, by Residence**

The large role of the injectable in the east and south, in competition with other methods, appears in Figure 4A. The rank ordering of methods is about the same in urban and rural sectors: first the injectable dominates, then the pill, then a smattering of condom, IUD, and traditional method use. The pattern is similar within both urban and rural sectors, even though overall rural use is less.

The following observations pertain to Figures 4A and 4B:

- *Urban use is higher than rural use for every method, within both country groups.*

- *Use of every method except traditional is higher in the east and south than in the west and central.*
- *That is true within the urban sector, and within the rural sector, separately.*
- *The injectable and pill are dominant in the east and south, while traditional methods dominate in the west and central group, with the injectable, pill, and condom well below those.*

Thus in the east and south modern methods have largely driven out traditional methods – within the modest range of just 30% using anything at all. In the west and central the old habit of reliance on traditional methods persists, among the low 17% who use anything. They are using what they know, in the absence of full access/information about alternatives. The other methods taken together somewhat exceed traditional methods (about 9% vs. 7.8%) and that ratio may gradually improve – for example in cities the modern methods do better as a proportion of total use.

**Method Mix Differences in Use, by Residence**

Taking all users as the focus, it is easier to see the relative positions of the various methods in terms of user preference (Figures 5A and 5B). In the east and south, over a third of all users are on the injectable. Interestingly this is higher, at 40%, in the rural sector due to a lesser role for all of the other modern methods. In both sectors the aggregate of all methods other than the injectable is very important, constituting about 64% of all use (total column in Figure 5A). Thus this is not yet a case of a one-method program; taken together the pill, condom, and sterilization remain highly significant.

**Table 1:** Dependence of total and modern contraceptive use on injectable use

	East/Southern Countries		West/Central Countries	
	R2	Slope	R2	Slope
Total use and injectable	0.62	1.78	0.04	-1.58
Modern use and injectable	0.59	1.82	0.18	1.13

(19 countries in each group)

The west and central group is at an earlier stage of program development for contraceptive provision; consequently not quite half of all use is of traditional methods. After that, the pill and condom are favored with the injectable close behind the condom. Rural users especially remain with traditional methods.

In both country groups the IUD is essentially absent from the picture; both it and sterilization are clinical methods requiring advanced training and equipment and involving pelvic examinations. However sterilization ranks well above the IUD, due to its lengthy duration of use. A few adoptions each year cumulate to raise total prevalence of use. For sterilization prevalence to be extremely low means that its annual adoption rates had to have been consistently very low; otherwise use among past adopters would naturally accumulate over time, pushing up the current prevalence level.

#### Method Differences in Use, by Wealth Quintiles

The surveys used above separate all respondents by “wealth quintiles.” These divide the population into five groups of equal size, each one with 20% of the population, according to the basic standard of living<sup>4</sup>. The quintiles usually correlate with education and with residence, with the poor quintiles being more rural and having less education.

The poorest quintiles also use contraception less, but the interesting question here is whether quintiles differ in their method preferences, and specifically whether the injectable is especially favored in certain quintiles. As Figure 6 shows, all

methods rise by quintile, but at different rates. In the East/South countries, the gaps keep growing below the injectable and especially the pill. The higher the quintile, the greater the relative preference for the injectable and pill. With Quintile 1 (the poorest) as the base, each next higher quintile tilts more sharply toward those two methods, away from the condom, sterilization, and traditional methods. Because the bottom quintiles are usually more rural and less educated they are likely to be farther away from services.

The West/Central is different – there it is traditional methods and the pill that take off sharply, but only in the top quintile. The injection and condom and especially sterilization increase far less. So the selectivity for modern methods is restricted to the pill; otherwise the upper quintiles favor the old methods. Interestingly, condom use by the upper three quartiles is about the same in both groups of countries.

#### Injectable Use among Unmarried Women

Sexually active unmarried women have discovered the injectable, and 12% to 25% rely upon it in some east and southern countries (Table 2). Their share of the market is not large, but the total quantities of supplies required are appreciable and growing. For these women the appeals are no doubt similar to those for married women: female control, secrecy, easy start, reversible, and simplicity.

**Table 2:** Percent of unmarried, sexually active women using the injectable in selected countries

East/South	% Using	West/Central	% Using
Namibia, 2006/7	25%	Niger 1998	11%
Madagascar, 2008/9	17%	Sierra Leone 2008	7%
Ethiopia, 2005	17%	Burundi 1987	6%
Kenya, 2008	17%	Mali 2006	6%
Malawi, 2010	15%	Guinea 1999	5%
Tanzania, 2010	15%	Liberia 2007	5%
Lesotho, 2004	12%	Mali 2001	5%

Among the west and central countries 8 countries show 5% or more using the injectable, up to 1% in Niger in its 1998 survey and 9% in Senegal in 2005. One out of ten is not a trivial proportion, so in at least a few countries the injectable may be taking hold among sexually active unmarried women, most likely in the urban areas.

### Sources of Supply

The public sector is the primary source of injectable supplies (Table 3). In the east and south, 9 of the 11 countries show over 75% of supplies as public in their recent surveys, and in the west and central 10 of the 13 countries do so. Clearly the method has won a place in the policies and implementation activities of the governments involved, and funding has been found to provide the supplies and maintain the necessary delivery infrastructures. The supplies alone are considerable: in Kenya for example, with 22% of married women using the method, 5.2 million injections are needed annually, which cost at least \$6.7 million at the international tender cost for donors, not counting any allowance for pipeline buildups or wastage.

The two groups of countries disagree with respect to trends. In the east and south the public sector has lost share in 8 of the 11 countries, usually by a small margin. The reverse has occurred in the west and central, where the public sector has gained in 9 of the 13 countries, often by a large margin. There the figures are somewhat unstable since the base of users is small. Especially in places where the total users of the injectable are still few, or where at least the private market is still small, commercial firms may see very little potential in expanding their distribution to pharmacies or private medical firms.

### Injectable Use Outside of Sub-Saharan Africa

A perspective on injectable use within Africa is afforded by its use in other regions. Its use is substantial in only two countries in Asia, Indonesia and Thailand. It was in Thailand that the injectable received its first large scale application, in McCormick Hospital in Chiangmai City starting in 1965<sup>5</sup>. Indonesia's experience is

more recent: surveys show the buildup of injectable use beginning only in the mid 1980s, with 7% using it in 1985. Now, at a world record of 32% using the method it represents an usual reliance on the private sector: 75% of injectable users obtain their supplies from the private medical sector, primarily from private midwives (2007 survey).

Latin America is the most active region outside of east and South Africa, but countries there are selective, as not all favor the method.

	% using injectables
Indonesia, 2007	32%
Nicaragua, 2006	23%
El Salvador, 2008	23%
Paraguay, 2008	17%
Peru, 2000	15%
Guatemala, 2008	15%
Honduras, 2005/6	14%
Jamaica, 2008	14%
Thailand, 2005	12%

Elsewhere there is no appreciable injectable use: very little in the Middle East, and essentially none in the former USSR countries. Causes of this must be variable, involving uneven commercial interests, public sector funding problems, past controversies as to the injectable's side effects and reversibility and history in the former USSR with its near absence of contraception. Actually every contraceptive method shows the same uneven pattern of geographic selectivity: countries pick and choose, finding different paths to increased total use and lower fertility rates.

### The Discontinuation Problem

Use of the injectable is high in the east and south, partly because it is an "easy start" method compared to the IUD or sterilization. However it is also prone to being "easy stop" since users can simply fail to show up for the next quarterly or bi-monthly shot. Also, service providers can interrupt wanted use, as in a South African study showing denial of re-injections when users appeared behind the standard schedule<sup>6</sup>. In any case, one downside of the injectable is its high discontinuation rate. While recent national estimates are scarce<sup>7</sup> the five DHS surveys below

**Table 3:** Percent of injectable use supplied by the public sector: Early vs. recent dates (early date shown)

<b>East and South</b>	<b>Early Survey</b>	<b>Recent Survey</b>	<b>Gain for % Public</b>
Eritrea 1995	92	91	-1
Ethiopia 2000	92	85	-7
Kenya 1998	64	65	1
Madagascar 1997	56	83	27
Malawi 2000	80	78	-2
Mozambique 1997	93	91	-2
Namibia 2000	96	95	-1
Tanzania 1996	88	84	-5
Uganda 1995	61	36	-25
Zambia 1996	71	92	21
Zimbabwe 1994	86	78	-7
<b>West and Central</b>			
Benin 1996	73	75	2
Burkina Faso 1993	69	97	28
Cameroon 1991	32	74	43
Chad 1996-97	92	79	-13
Cote d'Ivoire 1994	58	75	17
Ghana 1998	88	87	-1
Guinea 1999	82	85	2
Liberia 1986	41	65	24
Mali 1995-96	65	76	11
Niger 1992	98	93	-5
Nigeria 1999 <sup>(5)</sup>	69	54	-15
Senegal 1992-93	88	92	4
Togo 1988	43	92	49

provide information. They give a range from 25% to 36% of injectable adopters who stop within the first year. Even more cease use in succeeding years.

Table 4, top panel, shows side effects and health concerns to be important reasons, with 10% to 20% of adopters stopping in the first year. A variety of miscellaneous reasons account for another 8% to 13% (Madagascar's figure merges all reasons). Moreover, the desire to seek a pregnancy accounts for 6% to 8%. Method failure is rare. All these figures get worse with time, with more terminations into the second and later years among each starting cohort of adopters.

The bottom panel of the table sums all reasons to 100%. The reasons do not reconcile completely with the top panel since they come from a different part of the DHS questionnaires. Nevertheless, side effects and health concerns are very important;

together they account for 30% to 40% of terminations. The percentage wanting to become pregnant seems surprisingly high, especially compared to the top panel. Such high figures suggest considerable ambivalence among women adopting the injectable in the first place. A focus group study in one Kenyan district included users, spouses, other family members, and service providers<sup>8</sup>, eliciting a wide range of particular reasons for discontinuing, classified into logistical, social, and medical reasons.

What isn't known is what users do after stopping. Some become pregnant, of those some have abortions, some switch to other methods; some go to non-use and do not become pregnant, at least for a while. A careful analysis by Ali and Cleland<sup>9</sup> of 23 DHS surveys including four of the five countries in Table 4 showed that the injectable had the highest discontinuation rate among the six methods examined; it also showed that the tendency to switch promptly to an alternative method after discontinuation<sup>10</sup> was lowest among the five sub-Saharan African countries included.

**Churning:** In any case, a method that combines high prevalence with high discontinuation must suffer incessant circulation of women in and out of use. Many women leave the pool of users constantly, but many keep entering it; otherwise current prevalence could not remain high. This "churning" process is wasteful for both users and suppliers, and it calls for the ready availability of alternative methods, with effective counseling, so that women and couples can sort through their options to find a regular method that suits their needs and life stage. Proper counseling of users of all methods during the discontinuing and switching stages is clearly needed, even without firm documentation that it improves outcomes.

## Discussion

The injectable's take off in the east and south of sub-Saharan Africa has been a rare case of a single method winning a large public response, in numerous countries simultaneously. Not since the early introductions of the IUD, the pill, and simpler sterilization in the 1960s and 1970s, has that occurred. As in the past, the introduction of a

**Table 4:** Percentage of injectable adopters stopping in the first year, by cause.

	Method failure	To become pregnant	Side effects, health	All other reasons	Total reasons	
Ethiopia 2005	0.3	8.1	10.9	12.7	32.0	
Madagascar 2008-09	-	-	-	26.3	26.3	
Malawi 2004	1.4	7.6	13.9	9.7	32.5	
Tanzania 2004-05	0.9	5.5	20.9	9.1	36.5	
Zimbabwe 2005-06	1.5	3.5	10.9	8.4	24.3	
Distribution of reasons for stopping						
	Became pregnant	To become pregnant	Side effects	Health concerns	Other	Total
Ethiopia 2005	1.7	32.5	4.4	26.4	22.7	100
Madagascar 2008-09	NA	NA	NA	NA	NA	NA
Malawi 2004	4.6	36.0	25.4	9.3	13.0	100
Tanzania 2004-05	2.1	34.1	38.6	2.2	4.7	100
Zimbabwe 2005-06	6.0	28.0	21.3	8.4	10.1	100

new method with attractive features has raised total contraceptive use<sup>11</sup>. A recent analysis by Jacob Adetunji<sup>12</sup> adds details for selected African countries especially for competition between pill use and injectable use, showing the latter's growing share of all use. It points up the importance of the husband's attitudes and the number of living children in affecting the choice of the injectable. It also considers cost and long term resupply issues.

All resupply methods have short continuation rates, and unless there is prompt switching to another method the risk of an unplanned pregnancy is substantial. Even IUD adopters expect an average use time of only three to four years, and the IUD is nearly absent from sub-Saharan Africa. Nevertheless, the injectable has provided another option, and for some women it is quite satisfactory. The low average use time conceals a broad distribution, in which some adopters find it a useful method for the longer term. It can serve for some years, though not for the full span of 15-20 years for women who complete their desired childbearing by age 25 or 30.

So far it is the public sector that has supplied most supplies and services. The potential of the private medical sector has not been realized, nor has that of the pharmacies, which given the

training and authorization can be another source. In time the private sector can offer another choice for the method, which would raise its use by another increment.

The injectable illustrates another lesson, that contraceptive technology is important. The positive traits of the injectable that, in some settings at least, make it attractive have led to exceptionally high levels of use in countries as disparate as Indonesia, Thailand, Peru, Nicaragua, and South Africa. A recent review by the Guttmacher Institute<sup>13</sup> assesses the potential for reducing unmet need if current contraceptive methods can be improved, or augmented by entirely new ones beyond the several that are currently known but despite years of demonstrations have not taken off.

The growth of the injectable presents an interesting opportunity to tease out the relative importance of programmatic efforts vs. a grass roots response by the women themselves. Both supply and demand factors have been in play. For demand, the appeal of the injectable rests in its simplicity, female control, potential anonymity, and its reversibility, as well as its high reliability. For supply, the public providers may have found the method's simplicity and freedom from vaginal procedures to ease the workload, especially under the heavy burdens of the AIDS crisis, which was

most severe in the east and south. More credit goes to the supply side if a substantial proportion of injectable adopters were persuaded by program staff to switch from other methods in preference to ceasing use entirely. A related question is where the injectable adopters came from, in terms of what methods were they using before, if any.

However some puzzle remains as to why only the east and south have gone so strongly for the method in relation to other regions. Cultural/religious differences do not appear to explain the differences with North Africa or with the Middle East. Most of the low-use countries in the west and central group have Francophone histories, which correlates to lower use of all methods except traditional methods. In any case, use of every modern method in that group is well below that in the east and south, and total prevalence is only 17% vs. 30% in the two groups.

As to the future, injectable use seems bound to rise to yet higher levels in the east and south, where it is already well established. No signs of plateauing have yet appeared except in South Africa, with its high level of 25% prevalence (for married/in union women aged 15-49). Where the injectable has not yet taken hold it is unlikely to become important since countries are so selective in which methods become prominent. They typically freeze into a pattern in which two or three methods account for most use, as in the Middle East where the IUD or pill has become decisive.

## Contribution of Authors

John Ross conceived and designed the study; both he and Alfred Agwanda developed the manuscript, researched the literature, and analyzed the secondary data on which the article is based. Both authors approved the manuscript.

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## References

1. <http://www.statcompiler.com/>
2. United Nations, Department of Economic and Social Affairs, Population Division (2011). *World Contraceptive Use 2010* (POP/DB/CP/Rev2010). Available on-line.
3. In the east and southern countries, medians showed the injectable use rising from 1.6% to 9.9% for a gain of 8.4% married/in union women using the method. Means showed the rise from 2.5% to 12.2% for a gain of 9.7%. (For the 13 countries with multiple surveys the average date for the earliest survey was 1992 and 2006 for the latest survey, with a mean and median interval between of 14 years.)
4. The wealth index is one measure of the long-term standard of living. It is a composite of the household's ownership of consumer goods, various dwelling characteristics such as toilet facilities, type of drinking water source, and other characteristics related to the household's socioeconomic status. The household rating is assigned to each respondent in it. See Gwatkin et al., 2000 for details of the index construction. Gwatkin, D.R., S. Rutstein, K. Johnson, R.P. Pande, and A. Wagstaff. 2000. *Socio-economic differences in health, nutrition, and population*. HNP/Poverty Thematic Group. Washington, D.C.: World Bank.
5. Unhanand M, Asavasena W, and Varakamin, S. *Thailand: Country Profile*. March 1972. New York: The Population Council.
6. Baumgartner JN, et al. Timeliness of contraceptive re-injections in South Africa and its relation to unintentional discontinuation. *International Family Planning Perspectives* 2007; 33(2):66-74.
7. Older information for numerous countries appears in Curtis S and Blanc J. Determinants of contraceptive failure, switching, and discontinuation: An analysis of DHS contraceptive histories. DHS Analytical Reports. Calverton, MD: Macro International, 1997.
8. Burke HM and Ambasa-Shisanya C. Qualitative study of reasons for discontinuation of injectable contraceptives among users and salient reference groups in Kenya. *African J. of Reproductive Health* 2012; 15(2):67-78.
9. Ali MM, Cleland J. Contraceptive switching after method-related discontinuation. *Studies in Family Planning*, 2010; 41:129-33.
10. "Discontinuation" here pertains to all methods, not just to the injectable; however the statement most probably applies to the injectable as well.
11. Early examples are in R. Freedman and B. Berelson, The record of family planning programs. *Studies in Family Planning*, 1976: 7(1):1-40, Figure 11.1.

12. Adetunji J. Rising popularity of injectable contraceptives in sub-Saharan Africa. *African Population Studies*, 2011; 25(2):587-604.
13. Darroch JE, G Sedgh, and H. Ball. *Contraceptive Technologies: Responding to Women's Needs*. New York: Guttmacher Institute, 2011.