Transitions in the Method Mix of Contraceptive Use In Developing Countries

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ABSTRACT

The method mix of contraceptive use is severely unbalanced in many countries, with over half of all use provided by just one or two methods. That limits the range of user options and constrains the total prevalence of use, leading to unplanned pregnancies, abortions and births. This report identifies fifteen countries in which the method mix has evolved from a highly imbalanced one to a much better one, in a search for leads that other countries may follow. Results show many disparate paths to an improved method mix, though with suggestions of certain patterns. Regions differ markedly in their method mix profiles and preferences, raising the question whether resources are best devoted to better provision of the accepted methods, or to deploying neglected ones, or to a combination of both. A new measure, the "average deviation" (AD) from a balanced method mix, is employed to measure the extent of imbalance in the mix and to identify countries with favorable transitions in the mix.

Introduction

It has long been recognized that the availability of only one or two contraceptive methods in a country constrains total contraceptive use and limits the options that women and couples have to manage their pregnancies. Conversely, adding methods expands choice for women and men and increases contraceptive use (Ross and Stover, 2013). With renewed attention to human rights and family planning, including access to full, free, and informed choice of methods, writings consider what it means for programs to offer a full range of contraceptive methods (Center for Reproductive Rights, 2006; Hardee et al. 2014). In some countries governments or markets have not enabled access to certain modern methods, in other countries some methods are inherently unpopular, as with vasectomy and the condom. In some settings certain methods are not easily accessible because they are clinically difficult to implement, as with sterilization or the IUD in rural Africa. Clearly, the current method mix of contraceptive use is severely unbalanced in many countries, with over 50% of all use by a single method, or with only two methods accounting for most use (United Nations Population Division, 2013).

Experience with changes in the contraceptive method mix are of interest to policymakers and donors, since an improving method mix enlarges contraceptive method choice, letting women and couples move to the method that suits them best and change methods as their circumstances and needs change. How to expand method mix remains an important programmatic question. The purpose of this paper is to identify countries that have moved to a broadened contraceptive method mix and to explore the history of how the methods came into a better balance over time. Past improvements in the method mix of contraceptive use may offer clues as to how family planning programs can induce favorable changes in the future.

Attention to the contraceptive method mix alone can give misleading results however, since the same method mix may prevail at both low and high levels of overall use. A poor method mix can exist in a low prevalence-setting like Nigeria but also in China, where the contraceptive prevalence rate is in the eighties. Further, a rapid change in the method mix may distort it but simultaneously raise the overall level of use, as with the injectable in east and southern Africa. In that case a more distorted method mix has actually increased choice by making an important method more available than before. In short, an analysis of mix changes over time also requires attention to changes in levels of contraceptive use. This paper the reviews past work on measuring distortions in the contraceptive method mix, and builds on that work by analyzing trends over time in the distribution of users across eight contraceptive methods for which data are available in national surveys in low- and middle-income countries. The paper introduces a new measure of the extent of transitions in the method mix, the “average deviation” from a balanced method mix. This measure is used in conjunction with use of each method to give a more complete, and programmatically useful, picture of trends in method mix over

time. The paper identifies countries in which the mix was successfully broadened over time. It traces the manner in which the contraceptive methods moved differently through time and possible programmatic responses to improving the method mix in other countries.

Literature Review

A number of studies have focused on the skew in the method mix. A method mix is clearly distorted, or "skewed," when a single method covers more than half of all use (the 50% rule). A series of three analyses (Bertrand et al., 2014; Seiber, Bertrand, and Sullivan 2007; and Sullivan, et al., 2005) has applied the 50% rule to large numbers of national surveys. The latest, Bertrand et al. (2014), finds that 30% of 109 developing countries suffer from a skewed method mix, down from 35% in a 2006 analysis, which is a favorable trend. Among the contraceptive methods, the injectable showed increases, while sterilization and the IUD showed relative declines.

Other studies have analyzed the use of specific contraceptive methods within the method mix. A United Nations report (2013) covering both developed and developing countries found that globally more than half of all users relied on either female sterilization or the IUD. Use is highly concentrated: in nearly every country one or two methods accounted for over half of all use among married/in union women; however regions differed sharply in their particular method mixes. Little change occurred in the mix of methods between 1990 and 2011, either globally or within individual regions. Still, some increase occurred during that period for the injectable and some decline occurred for traditional methods. The pill had the widest geographic spread, and male methods the least. These imbalances limit easy movement among methods to adjust to personal circumstances and aims.

The increase in the injectable, noted in the UN review, has modified the method mix in eastern and southern African countries and elsewhere, as reviewed by Adetunji (2011) and by Sutherland, Otterness, and Janowitz (2011). Ross and Agwanda (2012) show that the injectable increase has been mainly additive to the prior level of total use, rather than substituting for other methods. While its popularity has raised total use in many settings, it is a short-term method and questions still remain about discontinuation and switching. Little is known about which methods if any women turn to when they discontinue use; Ali and Cleland (2010) in a review of 23 countries found that among users of modern methods who discontinued, as of three months later 26% were at risk of becoming pregnant, 10% were pregnant, and 60% had switched to another method (median values).

When the current mix is augmented by access to an additional method, total use tends to rise. Asian examples are in Freedman and Berelson (1976), also in Jain (1989), who estimated for Taiwan that adding one method to the mix would increase total use by about 12 percentage points (e.g. from 30% to 42% using). Ross and Stover (2013)

estimated that an addition of one method to at least half of the population raised modern contraceptive use by four to eight percent, based on 27 years of data for 113 countries.

Occasional efforts have been directed to specifying method mixes that are most appropriate for different user profiles and life objectives (Choe and Bulatao (1992) or to tools that relate the individual needs of women to the characteristics of alternative contraceptive methods (Galway and Stover, 1995) .

Data and Methods

Two sets of national surveys are used in this paper. Both data sets look at the range of contraceptive methods that are available in most surveys: male and female sterilization, IUD, pill, injectable, condom, implant, and traditional methods. Analyses on small sets of countries where other methods are used by non-trivial percentages of women might be done separately, but the aim of detecting marked changes in the overall mix requires attention to the eight methods studies here. The first set of national surveys is a thorough compilation by the UN Population Division of some 700 surveys from both developed and developing countries. After exclusions to remove surveys from developed nations including Eastern Europe and those that lack breakdowns by individual method, 666 surveys from 123 countries are included in this analysis.

The second set of surveys is the "DHS series," which includes Demographic and Health Surveys (DHS) and Reproductive and Health Surveys (RHS)[1] all contained in the "STATCompiler" available on-line from ICF International. This database contains 244 surveys from 84 countries. The DHS series is contained within the much larger UN series above, but for some purposes it is preferable to employ the DHS series alone since the methodological uniformity is better than among the disparate sources in all 666 surveys; also the DHS series is useful for certain analyses when additional variables on age, residence, and wealth quintiles are wanted. A comparison of the two series for both mix and prevalence of use shows close agreement; five of the eight contraceptive methods show higher values for the UN series than for the DHS series, but the differences are relatively minor. Partial agreement is guaranteed by the inclusion of the DHS series within the UN series.

Both series provide the percent of married women using each of the eight methods, totaling to the CPR (contraceptive prevalence rate). That is transformed to the method mix to show the percentage of use due to each contraceptive method, totaling 100%. Changes in these percentages over time make up the focus of this study. Where regional or other averages (means) are given they are unweighted, so every country receives the

[1] Most of the RHS surveys are from Latin America, supported by the Centers for Disease Control and Prevention.

same importance in the averages. The patterns would be somewhat different if they were weighted by population size. Certain individual countries are selected for separate discussion, and country details appear in several tables.

How even is a "good" mix? Where all methods are used equally the mix is perfectly even. At the other extreme, only one method is used. All countries fall between these extremes, possessing an uneven mix that is distorted to some degree. The mix often changes, but how large must a change be to signal an important shift? Small shifts in surveys can come from noise in the data and can come from sampling error, while very large shifts usually reflect real and important changes in behavior.

The Average Deviation (AD) Measure. Therefore a standard measure of the evenness of the method mix is needed, to gauge the extent of change and to compare one country or region with another. After a review of possible measures the "average deviation" was chosen, rather than the standard deviation, which squares deviations and can distort the picture. The average deviation (AD) is the simple average of the differences around the mean.

To explain the AD, if all eight methods held equal shares they would each have 12.5% of all users (100% divided by eight). In every country the methods vary around that average. Almost always the implant, male sterilization and condom fall below it. Depending on the region and country any of the other methods (the pill, injectable, IUD, female sterilization, or traditional methods) may rank above the mean or they may fall below the mean, e.g. the IUD in sub-Saharan Africa, or female sterilization in the Middle East.

The AD measure captures the extent of the eight differences around the mean (12.5%). The sum of differences around the mean can range from zero to 21.9: if every method is used equally the differences sum to zero, and if a single method covers all use, the differences sum to 21.9. Most AD values range from 6 to 19 and the interquartile range (i.e. the middle 50% of values, between the 25^{th} and 75^{th} percentiles). is from 8.6 to 12.2

Thus a high AD indicates a skewed method mix, with dominance of a few methods, and a low AD indicates fairly uniform use across the methods. As noted above, a low AD can occur at any level of the CPR: in Nigeria the CPR is low whereas in Peru the CPR is high, and both have low AD scores.

The AD can also be calculated for modern contraceptive methods; the paper includes a description of the AD for modern methods (ADM). However the dynamics of changes in contraceptive method mixes depend greatly upon the competition between modern methods and traditional methods, usually with the former partially replacing the latter, so the AD measure is preferred.

Findings

Variations on the Rule of 50% to Define "Skew"

The 50% Rule. As noted above, the rule whether a single contraceptive method accounts for more than half of all use is a useful measure of the skew in the mix. How sensitive is the analysis to the 50% rule? It is possible to vary it, to examine changes in the outlook according to the severity of the rule. If a single method must cover 60% of all use for skew to occur, fewer countries will qualify, and if the rule is 40%, more will qualify.

Table 1 presents the counts according to a range of rules from 30% to 70% for the 123 countries in the present analysis (latest surveys), as well as for all 666 surveys to encompass some of the historical experience. By the 50% rule, 28% of countries and 34% of surveys qualify as skewed, a finding close to that of Bertrand et al. (2014), which is expected since the two sets of data contain many of the same countries. Both results suggest some improvement: the higher figures for all surveys reflect more skew in the past, which agrees with the finding by Bertrand et al. of a decline from 35% to 30% of countries that are skewed.

Note that under the 40% rule the skewness counts jump to over half (55%) of all countries and nearly three-fifths (59%) of all surveys. In the other direction, by the 60% rule, about a fifth of countries are still skewed (18% of countries and 21% of surveys), which still indicates major defects in the balance among contraceptive methods. For particular countries the rules matter: Kenya and Uganda, each with a maximum of 47% would be included under the 40% rule but not under the 50% rule. Tanzania would qualify only under the 30% rule. On the other hand, some countries that qualify by the 50% rule would not qualify with the 60% rule. Examples in sub-Saharan Africa are Malawi (56%), Niger (56%), and Rwanda (51%), and elsewhere Egypt (59%) and Mexico (55%). Regardless of the rule used to measure skew, the results show major challenges for the aim of implementing a wider variety of contraceptive choices for the public.

The dominant method is quite different in different regions (**Figure 1**). Traditional methods stand out, both overall and in sub-Saharan Africa, and the injectable shows up there as well as in Asia. The IUD is important, but five of its seven countries are all in the five Central Asia Republics. Female sterilization appears in Latin America and in Asia. The other three methods do not show skew anywhere. The table total is 35 countries, and for each country meeting the 50% rule there are others in the same region close to 50%.

Global, Regional and Country Results

It is useful to begin with an examination of the basic pattern of contraceptive use by method, to clarify the overall shape of the method mix. **Figure 2** shows the mix among married/in union women from 666 surveys in 123 countries. Three methods each reach about 20% of all use (all methods sum to 100% of users), but the levels are best understood with attention to the actual percent of all married/in union women who are using each method. Those percentages are much lower, and are given along the X-Axis with the name of each method. Nearly half of all users in the mix rely either on the pill or on traditional methods, but that represents only 18% of women.

Regions differ greatly from these averages, as shown in **Table 2** (see Annex 1 for the same results from the DHS series). Many users rely on traditional methods in sub-Saharan Africa while fewer do so in Central Asia, where the pill is nearly ignored and the IUD is paramount. Male sterilization plays a minor role in each region, while female sterilization varies from 2% to 30% of users, with high values only in Latin America and Asia. The injectable takes low values in this large body of surveys but it ranks higher in the latest surveys especially in part of sub-Saharan Africa. The condom varies rather little by region, and accounts for around 8% of users. The implant is nearly negligible, but its use is increasing recently in selected countries.

At the country level, the IUD receives the highest value among all methods, and receives the maximum value in all five Central Asian Republics, in Viet Nam, in Egypt, and in some other Middle Eastern countries. Female sterilization is first in India, Brazil, Haiti, the Dominican Republic, and El Salvador. The pill comes first in Bangladesh, Zimbabwe, and Niger. The injectable is first in Indonesia, in Ethiopia, Malawi, and Rwanda. Vasectomy, condom, and the implant are never the most commonly used method. The most common maximum is for traditional methods, usually in countries with a low CPR, many of which are in sub-Saharan Africa.

Results by Age, Residence, and Wealth Quintiles

Method preferences change systematically as women age. In **Figure 3** traditional methods appear at the top of each bar, with the pill at the bottom. As age advances the most notable growth is for female sterilization; its share is quite low below age 25 but increases steadily and peaks at ages 45-49. All age groups neglect male sterilization and the implant. These results are for all regions merged; there is decidedly more selectivity by region or country. For unmarried, sexually active adolescents a clear shift occurs as youth age and gain more experience with contraceptive use. Between ages 15-19 and 20-24 reliance on the pill and injectable gain at the expense of the condom. Total use averages 53.7% at ages 20-24 compared to 42.9% at ages 15-19 (data not shown).

By residence, rural women show somewhat more preference for traditional methods and injectables than urban somen do, and less for the condom (data not shown). However the differences are relatively small. Total use averages 47.7% and 36.1% for urban and rural areas respectively.

According to wealth quintiles, method shares are not greatly different (data not shown). While the quintiles differ sharply in total use (from 29.9% to 34.5% to 38.0% to 42.2% and 49.9% in sequence across the five quintiles) the profile of their method preferences are basically similar. The main exception is the greater reliance on traditional methods by the bottom quintile and somewhat greater reliance on the injectable**.**

Dynamics of Method Mix Changes

The method mix in some countries has been quite skewed and has remained skewed, while in others it has improved substantially. There are fifteen countries in which positive changes to the method mixes have occurred, which show patterns that may be common and may suggest leads for program actions. These countries were identified according to large and consistent declines in the AD values across the surveys, demonstrating a growing evenness in the overall mix. Downtrends in the AD values are in **Figure 4**, using the full sequence of available surveys for the 15 countries. For each country's line in the figure, survey no. 1 is the earliest one done, and each subsequent survey follows. The time intervals between surveys vary among the countries. The longest series shown are 15 for Viet Nam starting in 1988 and 13 for Egypt starting in 1974-75.

The overall CPR levels vary considerably among these countries, since the same AD value can occur at either a high or low level of overall contraceptive use. However there is partial evidence that lower AD values, i.e. a more even mix, and higher CPRs go together. When all countries (latest surveys) are divided in half by low vs. high AD values (above and below the median), the average CPR value is 48.9 for low AD countries, with less skew, and only 41.0% for the high AD countries, with a more distorted mix. That is consistent with the likelihood that broadening the method mix can help lead to a higher overall level of contraceptive use, as Ross and Hardee (2012) found for 64 countries cross-classified by the variability of access among methods and the overall level of access. The highest CPRs were found where average access was both high and relatively even among methods. (**Annex 2** provides a listing of each of the surveys included in the analysis and detailed data on the trends for each of the eight contraceptive methods.)

In Figure 3 the AD values appear on the Y-Axis, starting at the left at nearly 20 for Rwanda and Benin, for early dates when traditional methods dominated the mix and the CPRs were quite low. On the other hand, at the right low AD values are shown for three

countries clustered near the bottom, for Iran, Peru, and Colombia. In all three countries traditional methods were very dominant at the start (at low CPRs), and they faded steadily over the years. However the three countries took quite different paths for which methods gained and lost among the new users, as discussed below. In Iran the pill declined as use of the IUD and female sterilization gained. Peru illustrates the opposite, where the IUD and female sterilization declined while the injectable and condom came into better balance with them. In Colombia the trends were very regular over the years, with declines from high early values for the IUD and pill, while female sterilization, the injectable, and condom gained. In these 15 countries the changes in the AD from the initial to the latest surveys have been substantial, down by 5.3 points, a 35% decline (**Table 3**).

Transitions in Each Country

The ways by which the method mix changes take many forms, and the interplay of which methods gain and which ones lose differs considerably. **Table 4** summarizes the shifts by country, arranged by region, followed by a look at what generalizations may emerge. In most countries, not all, women have been shifting from traditional to modern contraceptive methods.. The other notable trend is that the injectable, as a newer method, shows only gains, never a loss. In some countries, condoms have risen in the mix (and not necessarily in high-AIDS settings). In a few countries where one method was extremely dominant over the years, it has lost some ground recently. In some countries, rather irregular shifts have occurred, but the net effect has still been a steady decline in the AD values. Different paths have been followed. Variability is the overriding tendency at the country level, as was evident at the regional level

Patterns of Change

We can however take note of certain patterns. Four tendencies emerge, each of which is illustrated below for one of the countries. A chart for each one shows the detailed time trends for the methods to clarify how each mix improved over time. Because the method mix (which shows the distribution of use across methods and sums to 100%) is often confused with the CPR levels (in this case for the percent of married women of reproductive age using contraception), the X-Axis includes the CPR for each year so any point on the curve can be translated to the percent of all married women using the method. When the CPR is quite low the trend lines near the bottom reflect very small proportions actually using the method.

Take off of one method partially offset by changes among other methods. A first pattern, found in seven countries (Benin, Mali, Rwanda, Uganda, Haiti, Honduras, and Peru) is a marked rise by one contraceptive method that that is partially offset by changes among the other methods. The method starts well below the mean use of 12.5%, which

would be its share if women were using all eight contraceptive methods equally (100%/8 methods) and rises well above it, and the overall result with the other changes is less total dispersion in the shares among the methods than before, and a reduced AD value. The rise of the injectable is the primary example, illustrated by Uganda (**Figure 5**). Uganda's rise in the injectable is nearly a mirror image of the decline in traditional methods. The pill has lost ground while the implant is up in the latest survey. The other methods have been flat, and male sterilization has a trivial share, as it does elsewhere.

Systematic replacement of traditional methods with other methods. A second pattern is the systematic replacement of dominant use of traditional methods by the IUD and condom. Turkey is an outstanding example (**Figure 6**it was known for many years as the example of fairly high prevalence based just on traditional methods, primarily withdrawal. The surveys however show a marked decline in it as modern methods replaced it, especially the IUD, with recent gains by the condom and female sterilization. Colombia is another example of nearly all methods having shares close together, except for sterilization, the most used method. Its high level however reflects an accumulation over many years.

Stable domination by a single method, with some recent shifting. A third pattern shows a single method that is both dominant and stable, with minor losses recently. This pattern is shown in Egypt and Viet Nam. In Egypt the IUD has long been the primary method but it has lost some ground recently (**Figure 7**). In Egypt the pill was the primary method at the start, with all other methods clustered at the bottom. However it lost ground quite dramatically in favor of the IUD, which rose to a stable level of three-fifths of all contraceptive use in the country. The pill plateaued at 15%-20% with some recent rise for the injectable. The other methods are still minimal, even including traditional methods, which interestingly were never popular. Over the 33 years shown the CPR has risen from 25% to 60%.

Well balanced method mix. A fourth pattern, illustrated by one country, Paraguay, shows movement from marked distortion to an exceptionally well balanced mix (**Figure 8**); it has the lowest AD value, of 6.4, among all the countries. At the beginning the pill and traditional methods were highest, but by the end all methods were close together. Its CPR rose from 38% to 79% by 2008, illustrating a case of excellent choice with widespread use.

Mixed patterns. Besides the countries mentioned above, three others show mixed trends: Iran, Guyana, and Mongolia, with somewhat irregular trends that involve different sets of methods.

Discussion

In many countries the method mix is firmly entrenched, showing little movement for a long time. However the possibility of change can never be discounted, given the historic surprises of the emergence of the injectable in Indonesia and South Africa and then in much of east and southern Africa. The pill may see increased use, as it is acceptable and present in a wide variety of countries. The IUD, so popular in the Middle East, seems to have little future in sub-Saharan Africa, although a myriad of pilot projects over the years have shown that intensive efforts can elicit impressive responses from the public (Duvall et al. 2014; Hubacher et al. 2014). In both sub-Saharan Africa and the Middle East sterilization is minimal; for clinical methods to blossom a great deal of infrastructure work and training in the private or public sector is clearly necessary, and that is a challenge in the poorest countries. However the implant has shown small but definite gains in some African countries and it deserves further attention. Male sterilization has little future in Latin America or the Middle East; also the CPRs are already quite high in some countries there, and a high CPR may signal rather little potential for a change in method mix. The prospects for favorable changes will almost certainly involve different paths in the various settings, as they have in the past. In some, one or two methods will account for most change, and that can either improve the balance among methods or, by raising the CPR substantially, distort the method mix from its current state.

Historically, it is likely that in the early days of experience with modern contraceptives it was traditional methods that held center stage in the method mix since they were the only ones known in the culture, including some abstinence and deliberate extensions of breastfeeding. As modern methods became better known and total use levels rose, the method mix moved toward a better spread among methods, but in quite different ways. In each country the public was experimenting and gaining experience with alternative methods.

Regarding total prevalence of use, few countries have CPRs in the seventies without a substantial share of sterilization in the mix, and even those with extensive IUD use generally rise only to CPRs in the mid-sixties. Total fertility rates are usually at replacement level only in developing countries with considerable sterilization. Interesting exceptions are Viet Nam and Turkey, which rely on a combination of the IUD and traditional methods, with extensive use of abortion as a backup in Viet Nam and perhaps in Turkey as well (see Henshaw, Singh, and Haas, 1999.) With high discontinuation rates, total use of contraception is constrained, so the fertility effects of extensive use of short term methods are muted.

How can both the method mix and total use of contraception be improved? When we say that the method mix should be improved, we are really saying that some of the less favored methods should be made more available and attractive. That meets the needs of

more women and couples, it puts the mix into better balance, and it raises overall contraceptive use. However there are questions of strategy. Apart from the usual counsel to "try harder" to improve accessibility and quality, with better training and supervision, and an enlargement of services to the private sector etc., efforts to improve the balance of the method mix must target the neglected methods in each country and introduce new methods, as appropriate. However the CPR itself may rise faster under a different strategy, posing the question whether better implementation of the popular methods may prove superior for cost-effectiveness than efforts to advance methods that so far have won little response. Where the public in a country clearly dislikes a method and the national authorities neglect it, as with male sterilization or the condom in many places and the IUD in some, it may be better strategy to improve access and quality for the established methods, both to enhance actual choice and to advance the CPR level. The answer to such questions will vary; sometimes a relatively new method shows promise, as the injectable clearly did, and as the implant currently does in some countries. That suggests that a combination of improved implementation of established methods together with attention to neglected ones may work best.

Both the mix and the CPR may be improved through at least two basic approaches. The first is that special attention should go to the large market of discontinuers from resupply methods, both to prolong use for some (Jain et al. 2013), and to offer ready alternatives for others. Very large numbers of injectable users are stopping use throughout eastern and southern Africa, simply not showing up for the next shot. With proper counseling at the point of service they can be encouraged toward a longer trial or toward alternatives to adopt promptly after discontinuing.

The second is the strategic focus on postabortion and postpartum women. The leverage in that focus is not generally recognized; it automatically separates out the relevant segment of the whole population as it moves through its next pregnancy experience. Most women who ever have a next pregnancy or birth do so within five years, and during that period many or most encounter the various services related to pregnancy, birth, and child care. A more determined and disciplined focus on those programs would in many settings enlarge choice, meet women's needs faster, and improve the balance of methods in the mix.

Survey findings of the kind reported here need to be augmented by local studies to investigate reasons why certain methods experienced a take-off, and the extent to which central initiatives interacted with public response or private sector initiatives. Lessons from such studies can be drawn from such cases as Uganda's, where the injectable has replaced traditional methods and where other methods including the implant now approach shares of about 12%, the mean when all methods are in balance. A different type is that of Egypt, in which the IUD has proven popular, as it has elsewhere in the Middle East. Egypt may illustrate the case of a strong private medical sector, which may

also have had a role in the recent increase of the injectable. In neither region has sterilization been substantial, but in sub-Saharan Africa the IUD has also been quite minor, and the availability of long-term methods remains very problematic.

Both supply and demand factors can drive method availability and method use. These factors can include policy and programmatic changes undertaken by the public sector, but they can also include more widespread changes in social norms, economies, and the growing availability (and popularity) of private sector health care services. A more detailed historical analysis of the conditions surrounding those transitions would be instructive in providing the necessary context to fully understand the drivers of these transitions, and the extent to which they are replicable in other countries.

ANNEXES

Annex 1. Regional patterns from the DHS Series for Contraceptive Prevalence and Method Mix

Percent of Married Women Using Each Method, by Region, 244 Surveys								
	Female steril.	Male steril.	Pill	Injection	IUD	Male condom	Implant	Traditional methods
All Regions	7.2	0.4	7.6	5.8	5.6	3.3	0.4	8.5
Sub-Saharan Africa	1.8	0.0	5.6	5.6	0.7	1.9	0.4	4.8
Middle East, W. Asia	2.5	0.0	7.9	1.0	16.3	4.7	0.1	18.7
Central Asia	1.4	-	1.9	1.1	37.2	3.3	-	6.6
S. & SE. Asia	9.9	1.5	10.7	8.2	5.3	3.2	0.9	8.0
Latin America	18.4	0.6	9.6	7.6	5.7	5.0	0.2	10.6

Method Mix by Region, 244 Surveys								
	Female steril.	Male steril.	Pill	Injection	IUD	Male condom	Implant	Traditional methods
All Regions	15.1	0.8	21.4	16.8	11.7	8.4	1.1	24.7
Sub-Saharan Africa	7.3	0.1	26.1	23.4	4.3	8.8	1.6	28.3
Middle East, W. Asia	5.5	0.1	18.1	2.4	31.6	8.4	0.1	33.9
Central Asia	2.7	-	4.0	2.6	71.9	6.5	-	12.4
S. & SE. Asia	21.9	3.3	21.3	17.6	9.5	7.5	1.8	17.1
Latin America	31.1	1.0	16.4	13.2	9.9	8.6	0.6	19.2

Annex 2. Fifteen Cases of Improvement in the Method Mix

	Year(s)	Steril. female	Steril. male	Pill	Injectable	IUD	Condom	Implant	Traditional methods	AD Value
Benin	1981/82	0.0	1.5	4.5	0.0	1.5	3.0	0.0	89.4	19.2
Benin	1996	2.5	0.0	6.1	4.3	3.1	4.3	0.0	79.8	16.8
Benin	2001	1.6	0.0	9.8	11.4	4.3	7.1	1.6	64.1	12.9
Benin	2006	1.8	0.0	8.9	10.7	3.6	6.5	3.0	65.7	13.3
Mali	1987	2.2	0.0	19.6	2.2	2.2	0.0	0.0	73.9	17.1
Mali	1995/96	4.6	0.0	47.7	3.1	4.6	6.2	0.0	33.8	14.1
Mali	2001	3.7	0.0	34.6	25.9	2.5	3.7	1.2	28.4	12.8
Mali	2006	3.7	0.0	35.4	30.5	1.2	4.9	1.2	23.2	12.9
Rwanda	1983	0.0	0.0	1.8	3.6	2.7	0.0	0.0	91.8	19.8
Rwanda	1992	3.3	0.0	14.2	39.8	0.9	0.9	1.4	39.3	14.0
Rwanda	1996	0.0	0.0	17.4	29.7	2.2	1.4	1.4	47.8	14.4
Rwanda	2000	6.0	0.0	7.5	14.3	2.3	3.0	0.0	66.9	14.1
Rwanda	2005	2.9	0.0	13.9	27.2	1.7	5.2	0.0	49.1	13.2
Rwanda	2007/08	1.9	0.3	17.6	41.8	0.5	5.2	4.4	28.3	12.5
Rwanda	2010/11	1.6	0.0	13.8	51.1	1.0	5.6	12.2	14.8	10.5
Uganda	1988/89	16.3	-	22.4	8.2	4.1	-	-	49.0	12.6
Uganda	1995	9.5	-	17.7	17.0	2.7	5.4	-	47.6	11.2
Uganda	2000/01	8.8	-	14.0	28.1	0.9	8.3	1.3	38.6	10.8
Uganda	2004/05	8.7	-	15.3	49.5	1.0	5.1	1.5	18.9	11.5
Uganda	2006	10.2	0.4	12.3	43.2	0.8	7.2	1.3	24.6	10.7
Uganda	2011	9.6	0.3	9.6	46.8	1.7	9.0	9.0	14.0	8.9
Egypt	1974/75	0.0	0.0	80.2	0.0	10.1	0.0	0.0	9.7	16.9
Egypt	1980	2.3	0.3	70.0	0.3	17.1	4.2	0.0	5.8	15.5
Egypt	1984	5.1	0.0	55.7	1.0	28.4	4.4	0.0	5.4	14.8
Egypt	1988	4.0	0.0	40.9	0.3	42.0	6.4	0.0	6.4	14.5
Egypt	1991	2.8	0.0	33.7	1.1	51.1	4.4	0.0	7.0	14.9
Egypt	1992	2.4	0.0	27.6	1.1	59.7	4.3	0.0	4.9	15.6
Egypt	1995	2.3	0.0	21.8	5.0	62.9	2.9	0.0	5.0	14.9
Egypt	1997/98	2.6	0.0	18.8	7.2	63.7	2.8	0.2	4.8	14.4
Egypt	1998	2.5	0.0	16.9	7.6	66.5	2.1	0.0	4.5	14.6
Egypt	2000	2.5	0.0	17.0	10.9	63.5	1.8	0.4	3.9	13.9
Egypt	2003	1.5	0.0	15.5	13.2	61.2	1.5	1.5	5.7	13.1
Egypt	2005	2.2	0.0	16.7	11.8	61.7	1.7	1.4	4.6	13.3
Egypt	2008	1.7	0.0	19.7	12.3	59.9	1.2	0.8	4.5	13.7
Iran	1976/77	5.7	0.0	49.7	0.0	4.0	11.5	0.0	29.0	13.4
Iran	1989	8.0	0.0	36.3	0.0	7.4	11.4	0.0	36.9	12.0
Iran	1992	11.8	1.4	35.0	0.0	11.0	9.9	0.0	31.0	10.2
Iran	1993	13.7	1.5	36.5	0.0	10.7	10.0	0.0	27.7	10.1
Iran	1994	16.3	1.8	32.3	0.7	11.5	9.7	0.0	27.8	9.7
Iran	1995	19.3	1.8	32.1	1.8	10.0	8.0	0.0	27.0	10.2
Iran	1996	20.6	2.2	30.0	3.4	11.4	7.7	0.0	24.7	9.5
Iran	1997	21.4	2.6	28.9	4.0	11.5	7.5	0.7	23.4	9.1
Iran	2000	23.2	3.7	25.0	3.8	11.5	8.0	0.7	24.2	8.7
Iran	2002	20.8	3.1	34.3	3.1	10.4	8.2	0.5	19.5	9.3
Turkey	1963	0.4	-	3.8	-	-	16.3	-	79.5	17.7
Turkey	1968	0.3	-	5.8	-	4.2	11.5	-	78.2	16.4
Turkey	1973	0.3	-	12.6	-	7.9	12.4	-	66.8	13.6
Turkey	1978	1.2	0.4	16.2	0.8	8.0	8.2	-	65.2	14.1
Turkey	1983	2.3	-	15.4	0.4	15.1	8.3	-	58.5	12.9
Turkey	1988	2.8	0.2	10.1	0.2	22.7	11.7	-	52.4	12.5
Turkey	1993	4.7	-	8.0	0.2	30.6	10.7	-	45.8	12.8
Turkey	1998	6.6	-	7.0	0.8	31.3	13.0	-	41.3	12.0
Turkey	2003	8.1	0.1	6.7	0.6	28.7	15.3	-	40.5	11.8
Turkey	2008	11.4	0.1	7.3	1.2	23.2	19.6	-	37.1	10.6
Colombia	1969	0.0	0.0	23.4	0.0	13.2	7.3	0.0	56.1	13.8
Colombia	1976	10.0	0.5	33.2	1.0	21.2	4.2	0.0	29.9	11.7
Colombia	1978	17.2	0.0	39.5	2.3	17.7	3.2	0.0	20.0	11.1
Colombia	1980	22.5	0.4	36.6	4.2	17.1	3.2	0.0	16.0	10.6
Colombia	1986	29.3	0.6	26.2	3.8	17.6	2.7	0.0	19.7	10.7
Colombia	1990	32.5	0.8	21.9	3.4	19.3	4.5	0.0	17.7	10.3
Colombia	1995	36.3	1.0	18.2	3.5	15.7	6.1	1.0	18.2	9.6
Colombia	2000	35.5	1.3	15.5	5.2	16.3	8.0	0.3	18.0	8.8
Colombia	2004/05	40.2	2.3	12.5	7.5	14.4	9.1	0.4	13.6	7.7
Colombia	2010	44.2	4.3	9.6	11.6	9.5	8.9	3.9	8.0	7.9

Annex 2, continued										
	Year(s)	Steril. female	Steril. male	Pill	Injectable	IUD	Condom	Implant	Traditional methods	AD Value
Guyana	1975	27.9	0.0	29.5	0.0	18.4	0.0	0.0	24.3	12.5
Guyana	1991/92	17.3	0.0	35.1	5.2	24.1	14.8	0.0	3.6	10.3
Guyana	2000	12.2	0.3	30.4	10.0	17.1	23.8	2.7	3.5	8.4
Guyana	2005	8.8	0.0	36.0	11.2	22.4	18.0	0.3	3.2	9.7
Guyana	2006	5.1	0.0	38.1	10.7	16.4	17.3	8.0	4.5	8.6
Guyana	2009	12.5	0.0	21.7	11.3	17.2	30.4	0.5	6.4	8.0
Haiti	1977	1.1	1.1	17.4	1.1	2.6	5.8	0.0	71.1	15.9
Haiti	1983	10.1	1.4	31.9	2.9	2.9	7.2	0.0	43.5	12.6
Haiti	1987	18.8	0.0	33.3	11.6	5.8	2.9	0.0	27.5	10.6
Haiti	1989	24.8	0.0	40.6	15.8	5.9	5.0	0.0	7.9	10.9
Haiti	1994/95	17.1	0.0	17.1	14.9	3.3	14.4	6.6	26.5	6.9
Haiti	2000	9.9	0.0	8.2	41.8	2.1	10.3	7.1	20.6	9.4
Haiti	2005/06	6.5	0.0	10.2	34.1	1.9	16.4	5.0	26.0	9.7
Honduras	1981	30.5	0.8	44.7	1.1	9.2	1.1	0.0	12.6	12.6
Honduras	1984	35.0	0.6	36.7	0.9	11.0	2.6	0.0	13.3	11.9
Honduras	1987	31.3	0.5	33.3	0.7	10.7	4.5	0.0	18.9	11.5
Honduras	1991/92	33.6	0.4	21.8	1.1	11.0	6.3	0.0	25.9	10.9
Honduras	1996	36.3	0.2	19.8	2.2	17.0	6.4	0.0	18.0	10.3
Honduras	2001	29.1	0.3	16.8	15.5	15.5	5.2	0.0	17.5	8.0
Honduras	2005/06	32.5	0.5	17.3	21.2	10.1	4.4	0.0	14.0	8.7
Paraguay	1979	7.7	0.0	34.5	5.0	15.4	4.8	0.0	32.6	11.2
Paraguay	1987	10.0	0.0	30.1	8.0	11.4	5.1	0.0	35.3	10.1
Paraguay	1990	15.5	0.0	28.5	10.9	11.9	5.5	0.0	27.7	8.5
Paraguay	1995/96	13.4	0.0	24.1	11.1	13.6	11.6	0.0	26.3	6.8
Paraguay	1998	13.1	0.0	21.4	12.2	18.1	11.9	0.0	23.3	6.5
Paraguay	2004	15.8	0.1	20.6	14.3	15.8	16.4	0.0	16.9	6.2
Paraguay	2008	12.5	0.3	22.7	20.8	15.5	16.6	0.0	11.7	6.4
Peru	1969/70	8.0	0.0	12.0	0.0	4.0	12.0	0.0	64.0	12.9
Peru	1977/78	9.2	0.0	13.7	3.3	4.2	3.6	0.0	66.0	13.7
Peru	1981	10.0	0.0	12.5	5.0	10.0	2.5	0.0	60.0	11.9
Peru	1986	13.6	0.0	14.5	2.9	16.5	1.6	0.0	50.9	11.4
Peru	1991/92	13.6	0.2	9.8	3.3	23.1	4.8	0.0	45.2	11.1
Peru	1996	15.0	0.3	9.8	12.6	18.9	6.9	0.5	36.1	8.1
Peru	2000	18.0	0.7	9.8	21.7	13.3	8.2	0.3	28.0	7.7
Peru	2004/06	14.6	0.6	10.1	20.7	7.9	11.9	0.0	34.3	8.0
Peru	2007/08	13.6	0.4	10.6	22.8	5.6	13.8	0.0	33.2	8.4
Peru	2009	12.9	0.6	10.5	24.9	5.2	13.8	0.0	32.1	8.4
Peru	2010	12.5	0.5	11.2	23.6	4.4	15.1	0.1	32.6	8.4
Mongolia	1994	1.6	0.0	4.4	1.9	57.7	5.9	0.5	28.0	15.2
Mongolia	1998	4.0	0.0	7.0	5.2	53.8	5.8	0.3	23.9	13.2
Mongolia	2000	1.9	0.3	12.4	8.7	50.2	6.4	0.4	19.5	11.2
Mongolia	2003	4.4	0.0	16.0	8.4	47.6	7.8	0.4	15.4	10.4
Mongolia	2005	3.7	0.2	17.6	16.9	44.1	8.1	1.2	8.2	10.3
Mongolia	2008	4.7	0.0	17.7	14.4	40.6	12.2	0.4	10.0	8.8
Viet Nam	1988	5.1	0.6	0.8	0.4	62.1	2.3	0.0	28.9	16.5
Viet Nam	1994	6.0	0.3	3.2	0.3	51.3	6.2	0.0	32.7	14.7
Viet Nam	1997	8.4	0.7	5.7	0.3	51.2	7.8	0.0	25.9	13.0
Viet Nam	2000	8.2	0.8	7.3	0.5	49.9	8.2	0.0	25.0	12.5
Viet Nam	2000	7.9	0.6	9.5	0.7	57.4	8.0	0.0	16.0	12.1
Viet Nam	2001	7.7	0.5	10.0	0.7	55.8	7.9	0.0	17.3	12.0
Viet Nam	2002	7.5	0.6	8.0	0.5	48.0	7.4	0.0	27.9	12.7
Viet Nam	2002	7.2	0.5	10.4	0.9	56.6	8.5	0.0	15.9	11.9
Viet Nam	2003	6.9	0.5	11.4	0.9	57.0	7.4	0.0	15.7	11.9
Viet Nam	2004	6.6	0.4	11.9	1.1	56.0	9.3	0.0	14.7	11.4
Viet Nam	2005	6.3	0.4	12.5	1.2	55.5	9.7	0.0	14.5	11.3
Viet Nam	2006	5.5	0.2	10.6	1.5	54.9	11.0	0.0	16.3	11.6
Viet Nam	2006	7.7	0.7	11.9	1.6	47.6	10.1	0.1	20.3	10.7
Viet Nam	2007	5.6	0.4	13.2	1.1	55.4	10.5	0.1	13.7	11.2
Viet Nam	2010/11	5.0	0.1	13.0	2.2	40.0	16.4	0.3	23.0	10.6

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Table 1. Percent of 123 Countries and 666 Surveys Showing Skew in the Contraceptive Method Mix, by Various Rules.

Countries

Rule (%)	No.	%
30	115	94
40	68	56
50	35	28
60	22	18
70	10	8

Surveys

Rule (%)	No.	%
30	609	91
40	393	59
50	225	34
60	137	21
70	62	9

Table 2. Percent of Married Women Using Each Method, 666 Surveys in 123 Countries, by Region

		Prevalence of Use								
	Any method	Any modern method	Sterilization Female	Sterilization Male	Pill	Injectable	IUD	Male condom	Implant	Traditional Methods
All Regions	41.3	33.2	7.9	0.7	9.3	4.1	6.7	3.8	0.2	8.4
Sub-Saharan Africa	22.1	15.7	1.6	0.1	5.5	5.0	0.9	2.1	0.3	6.5
Middle East & West Asia	47.5	33.7	3.5	0.1	14.3	1.0	11.0	3.2	0.1	14.0
Latin America	53.4	44.9	16.6	0.5	12.3	4.0	6.2	4.9	0.1	8.4
Central Asia Rep.	54.6	47.1	1.2	0.1	2.5	1.2	39.1	2.8	0.0	7.5
East, S. & SE Asia	47.6	41.0	10.2	1.9	9.0	5.1	8.6	4.8	0.3	7.6

		Method Mix							
	Sterilization Female	Sterilization Male	Pill	Injectable	IUD	Male condom	Implant	Traditional Methods	All Users
All Regions	19.2	1.8	22.6	10.0	16.3	9.2	0.6	20.4	100
Sub-Saharan Africa	7.4	0.3	25.2	22.7	4.1	9.5	1.3	29.5	100
Middle East & West Asia	7.5	0.3	30.3	2.1	23.2	6.9	0.1	29.7	100
Latin America	31.3	0.9	23.2	7.5	11.7	9.3	0.2	15.9	100
Central Asia Rep.	2.2	0.1	4.6	2.3	71.9	5.1	0.0	13.8	100
East, S. & SE Asia	21.5	4.0	18.9	10.7	18.1	10.1	0.6	16.0	100

Table 3. Initial and Ending AD Values, Fifteen Countries

	Initial Survey	Latest Survey	Decline
Sub-Saharan Africa			
Benin	19.2	13.3	5.9
Mali	17.1	12.9	4.2
Rwanda	19.8	10.5	9.3
Uganda	12.6	8.9	3.7
Middle East			
Egypt	16.9	13.7	3.2
Iran	13.4	9.3	4.1
Turkey	17.7	10.6	7.1
Asia			
Mongolia	15.2	8.8	6.4
Viet Nam	16.5	10.6	5.9
Latin America			
Colombia	13.8	7.9	5.9
Guyana	12.5	8.0	4.5
Haiti	15.9	9.7	6.2
Honduras	12.6	8.7	3.9
Paraguay	11.2	6.4	4.8
Peru	12.9	8.4	4.5
Means	15.2	9.8	5.3

Table 4. Shifts in Contraceptive Method Mix by Country and Region, for 15 Countries

County/ region	Trend in the method mix
Sub-saharan Africa	
Benin	The injectable and pill have risen, while sterilization, the IUD, and condom, and especially traditional methods have fallen
Mali	The injectable has risen substantially with declines in the pill and traditional methods.
Rwanda	Since the disruptions of the mid-1990s the injectable has risen to over half of all use, while traditional methods have declined correspondingly. The implant gained in the latest survey.
Uganda	The injectable has risen at the expense of the traditional methods, with a recent increase by the implant.
Near East	
Egypt	The IUD rose quite remarkably to a high level, with a corresponding decline for the pill. Recently the injectable has shown some increase.
Iran	Sterilization has risen steadily; in the last survey it lost ground to a resurgence in the pill, while traditional methods lost ground.
Turkey	The extensive use of traditional methods gave way to a rise in the IUD and condom, as well as female sterilization.
East and Southeast Asia	
Mongolia	The pill, injectable, and condom have risen while the IUD and traditional methods have fallen.
Vietnam	The historic dominance of the IUD has weakened as the pill and condom have gained.
Latin America and the Caribbean	
Colombia	Sterilization rose very sharply over the years, along with a small rise for condoms. Shares for the pill, IUD, and traditional methods declined.
Guyana	The pill and traditional methods have lost ground, while the other methods show irregular trends that balance out to reduce skew.
Haiti	The picture changed sharply from 1994/95 onward. Sterilization declined while the injectable rose, with irregularities for other methods.
Honduras	The injectable is sharply upward with declines in the pill and in traditional methods.
Paraguay	The injectable and condom are up while the IUD and traditional methods have fallen.
Peru	The IUD is down, as is sterilization slightly, while the injectable and especially the condom have risen.

FIGURE 1. Number of Countries in Which One Contraceptive Method Accounts for 50% or More of All Use

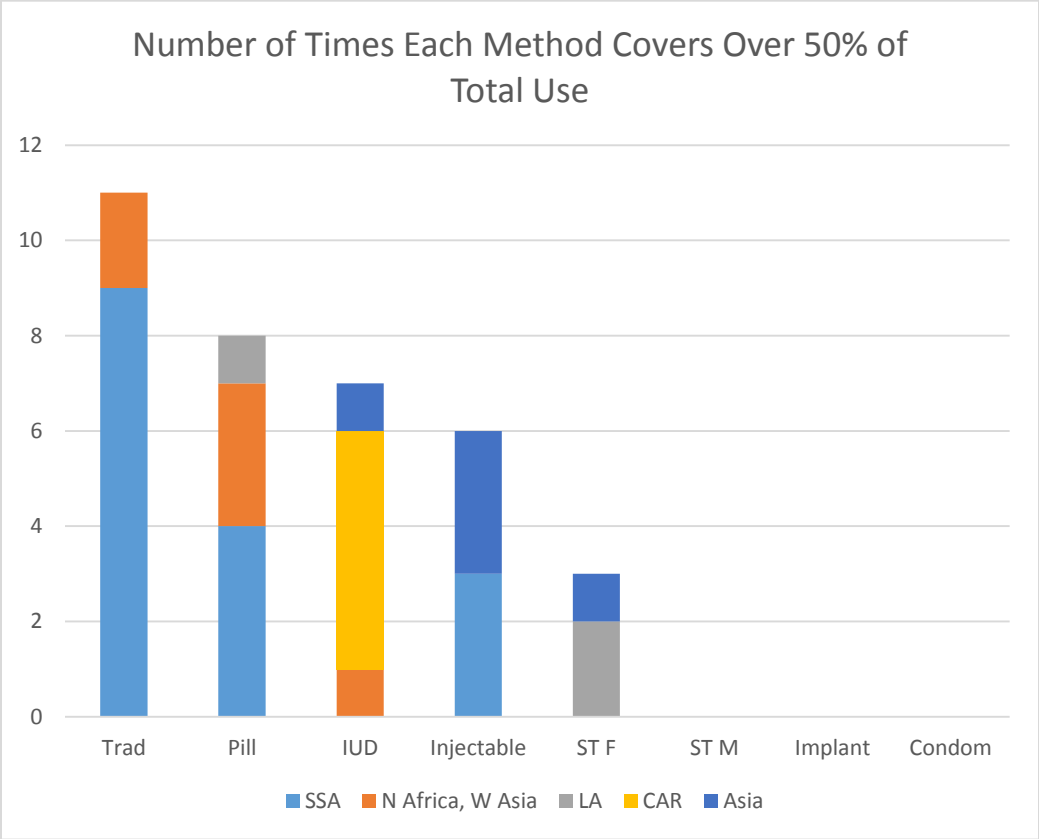


FIGURE 2

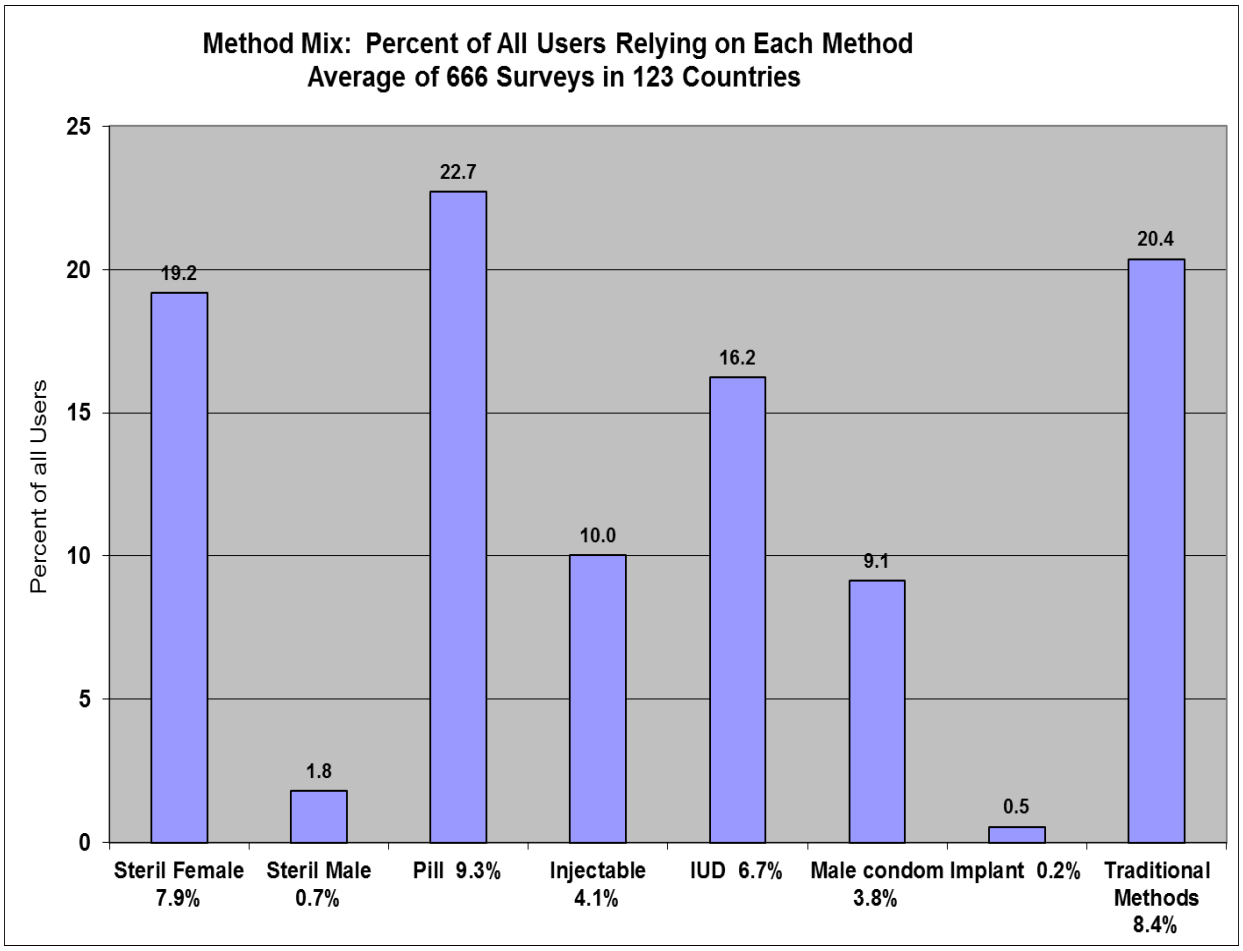

Method Mix: Percent of All Users Relying on Each Method
Average of 666 Surveys in 123 Countries
Percent of all Users
25
20
15
10
5
0
19.2
1.8
22.7
10.0
16.2
9.1
0.5
20.4
Steril Female 7.9%
Steril Male 0.7%
Pill 9.3%
Injectable 4.1%
IUD 6.7%
Male condom 3.8%
Implant 0.2%
Traditional Methods 8.4%

FIGURE 3

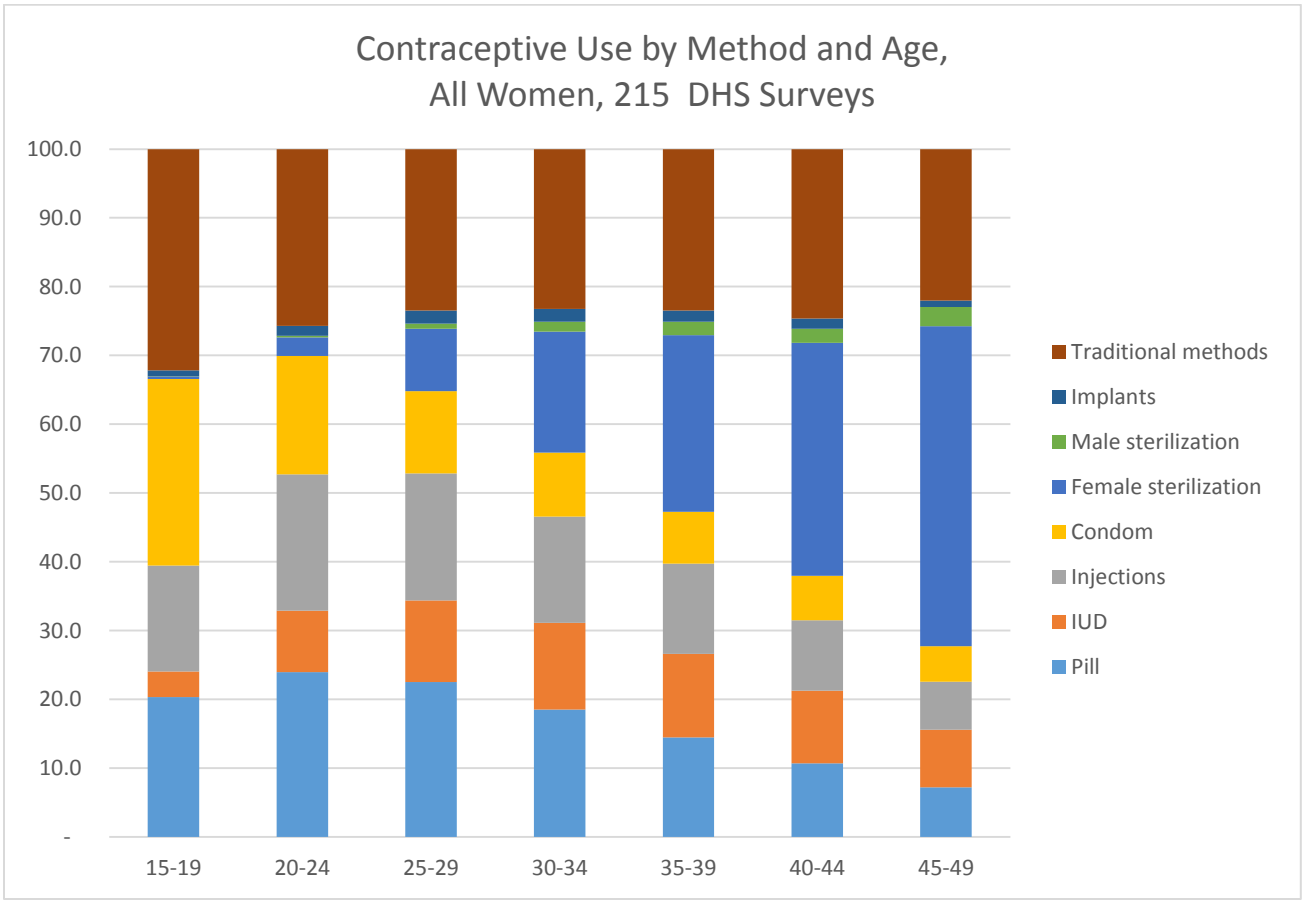

Contraceptive Use by Method and Age,
All Women, 215 DHS Surveys
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
-
15-19
20-24
25-29
30-34
35-39
40-44
45-49
Traditional methods
Implants
Male sterilization
Female sterilization
Condom
Injections
IUD
Pill

FIGURE 4

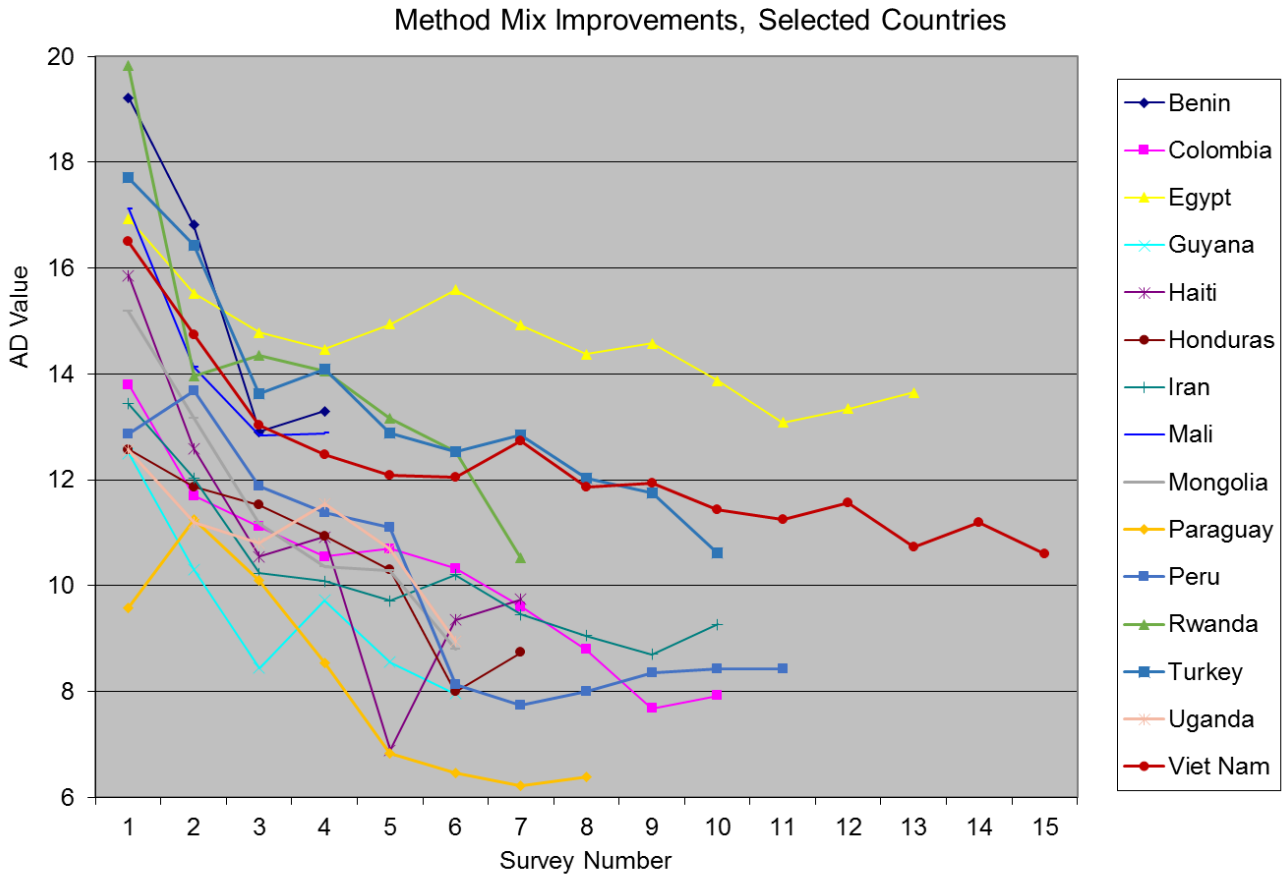

Method Mix Improvements, Selected Countries
AD Value
20
18
16
14
12
10
8
6
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Survey Number
Benin
Colombia
Egypt
Guyana
Haiti
Honduras
Iran
Mali
Mongolia
Paraguay
Peru
Rwanda
Turkey
Uganda
Viet Nam

FIGURE 5

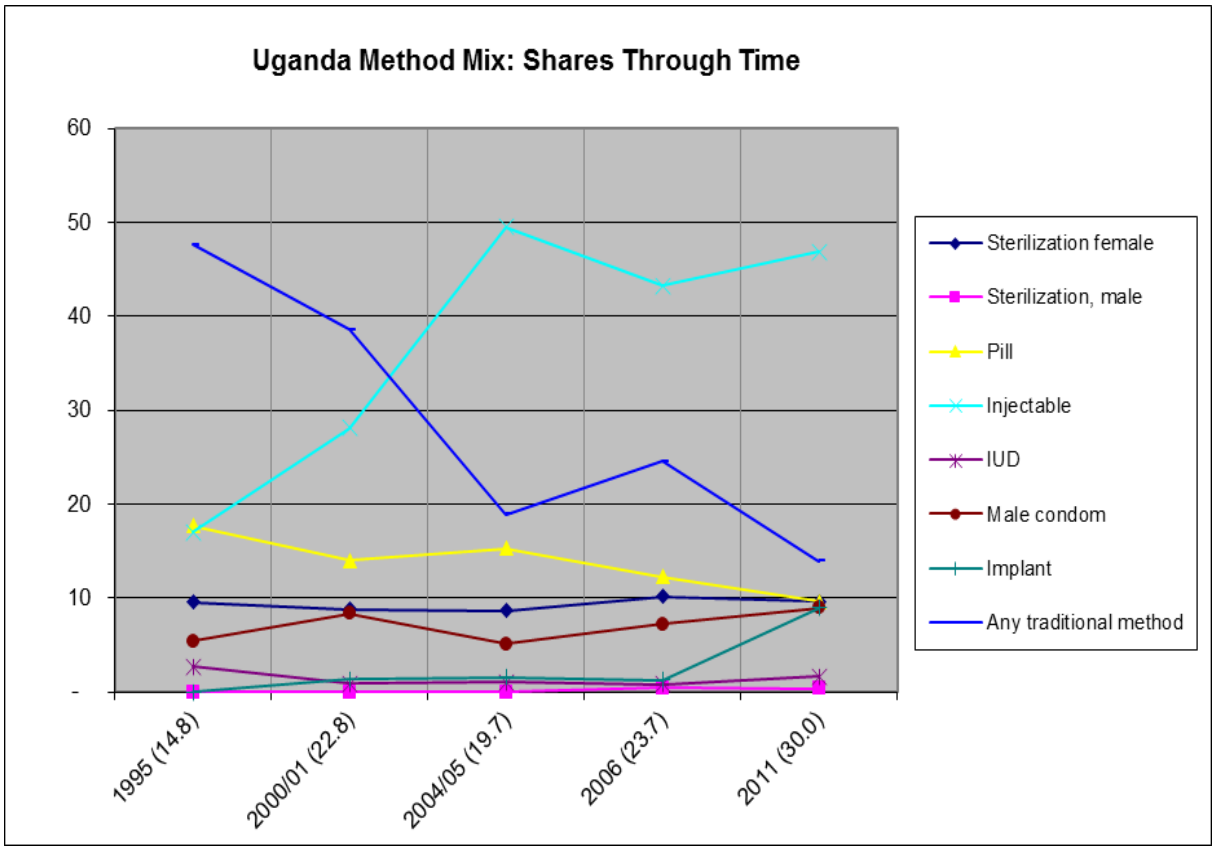

Uganda Method Mix: Shares Through Time
60
50
40
30
20
10
-
1995 (14.8)
2000/01 (22.8)
2004/05 (19.7)
2006 (23.7)
2011 (30.0)
Sterilization female
Sterilization, male
Pill
Injectable
IUD
Male condom
Implant
Any traditional method

FIGURE 6

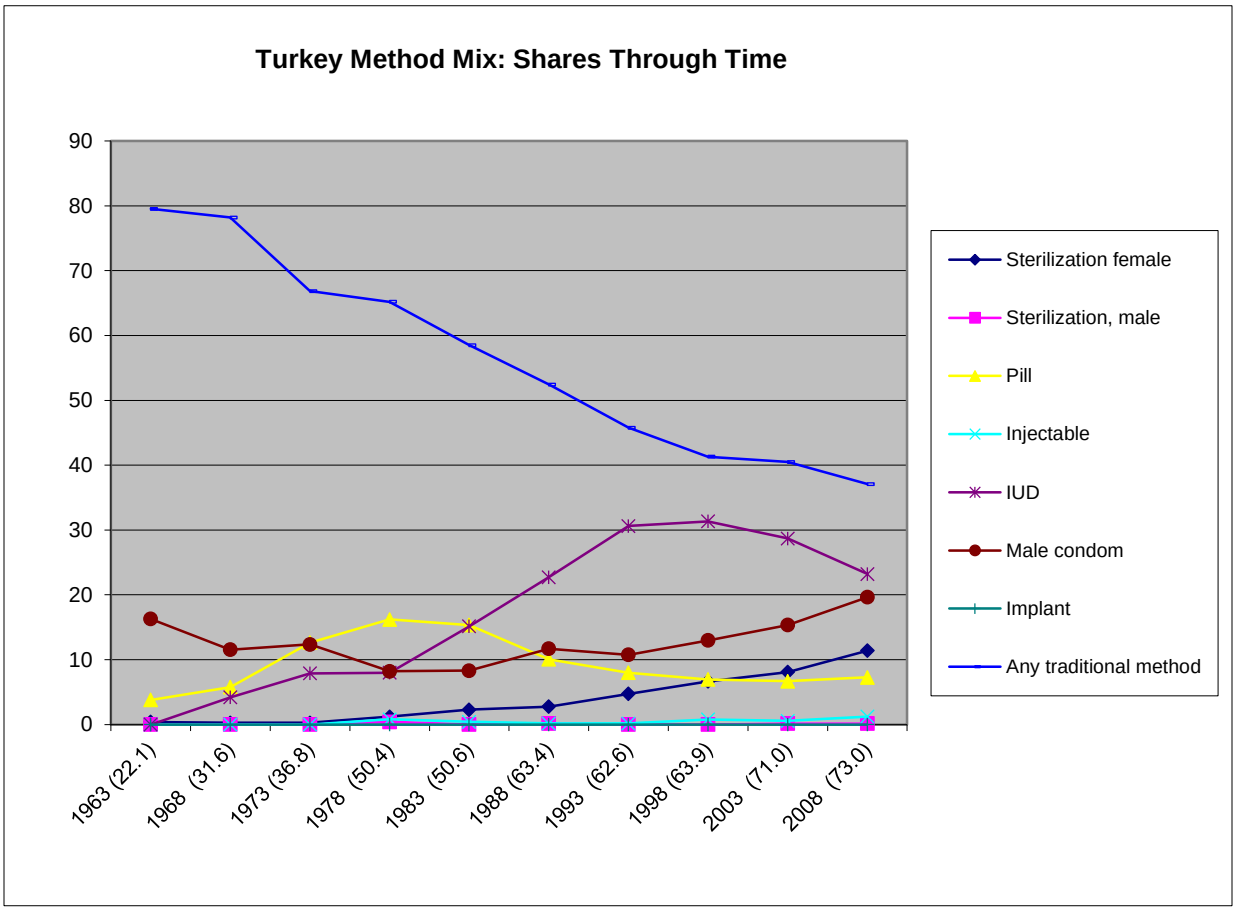

Turkey Method Mix: Shares Through Time
90
80
70
60
50
40
30
20
10
0
1963 (22.1)
1968 (31.6)
1973 (36.8)
1978 (50.4)
1983 (50.6)
1988 (63.4)
1993 (62.6)
1998 (63.9)
2003 (71.0)
2008 (73.0)
Sterilization female
Sterilization, male
Pill
Injectable
IUD
Male condom
Implant
Any traditional method

FIGURE 7

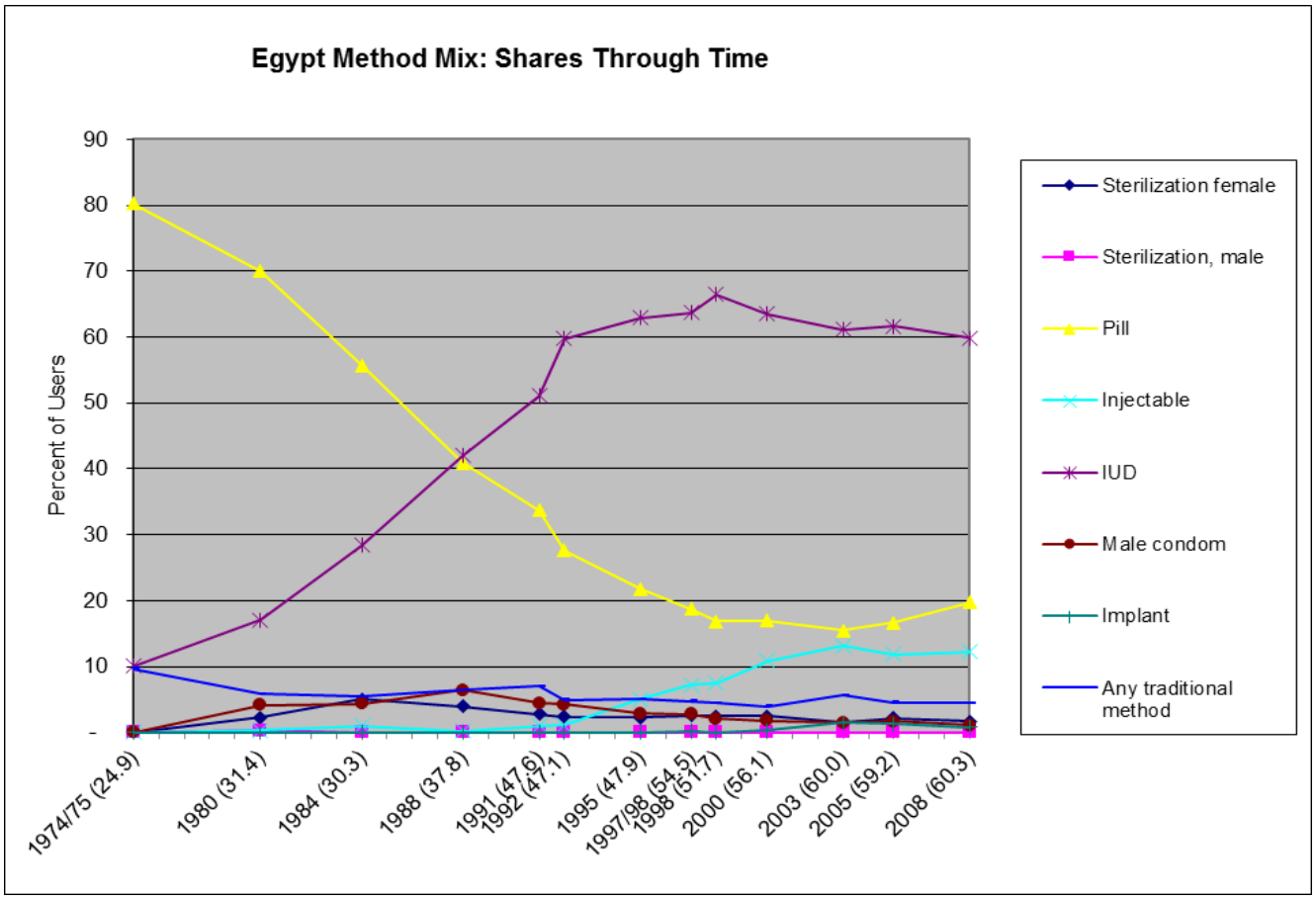
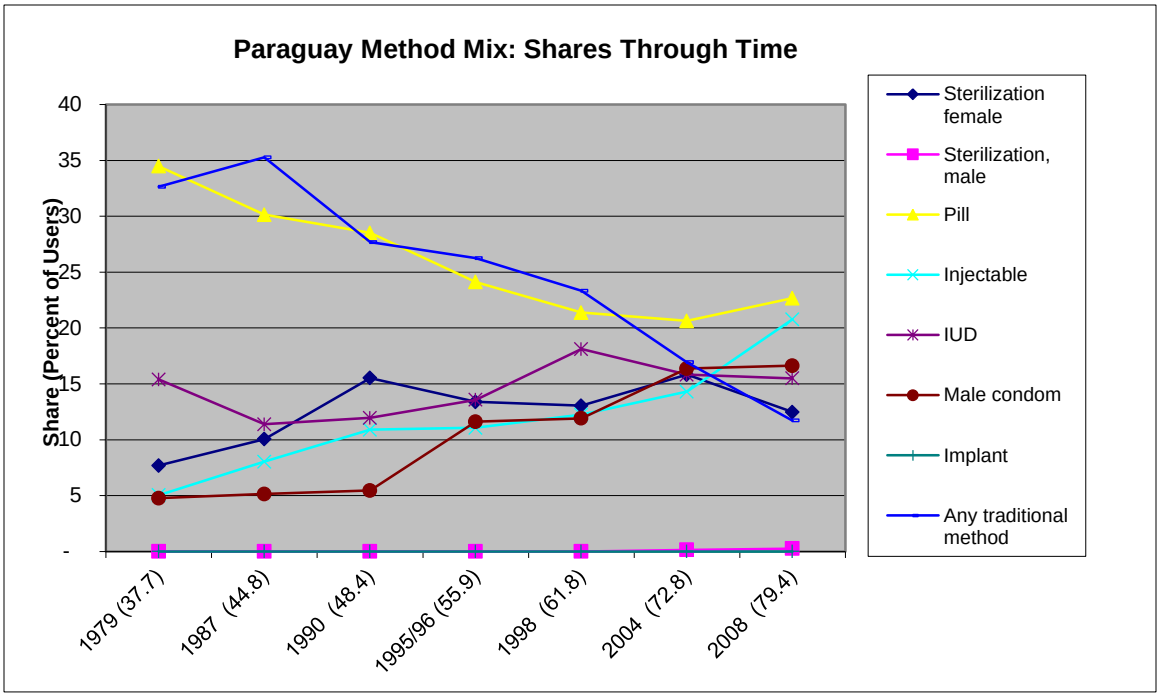

Egypt Method Mix: Shares Through Time
Percent of Users
90
80
70
60
50
40
30
20
10
-
1974/75 (24.9)
1980 (31.4)
1984 (30.3)
1988 (37.8)
1991 (47.6)
1992 (47.1)
1995 (47.9)
1997/98 (54.5)
1998 (51.7)
2000 (56.1)
2003 (60.0)
2005 (59.2)
2008 (60.3)
Sterilization female
Sterilization, male
Pill
Injectable
IUD
Male condom
Implant
Any traditional method

FIGURE 8


Paraguay Method Mix: Shares Through Time
Share (Percent of Users)
40
35
30
25
20
15
10
5
-
1979 (37.7)
1987 (44.8)
1990 (48.4)
1995/96 (55.9)
1998 (61.8)
2004 (72.8)
2008 (79.4)
Sterilization female
Sterilization, male
Pill
Injectable
IUD
Male condom
Implant
Any traditional method