# Contraception and Unintended pregnancy: The changing relationship overtime in sub-Saharan Africa.

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## Abstract

Contraception is hailed as one of the most important health innovation that enables women and couples avoid unintended pregnancies. As such contraceptive prevalence is expected to be negatively associated with unintended pregnancy. However, one study examining the relationship between unintended pregnancy and modern contraceptive use globally has produced counter-intuitive results. This study draws on Demographic and Health Survey data from 206 country surveys to explore if this relationship holds when examined regionally and overtime. I find that the counter-intuitive relationship only holds for Sub-Saharan Africa (SSA). Using selected countries from SSA and other regions I find that the counter-intuitive relationship holds true at the earlier stages of the fertility transition. I conclude that the unexpected relationship between unintended pregnancy and contraception is only temporary in the early stages of fertility transition when the demand for contraception is higher than the ability of the health system to satisfy it.

Keywords: Unintended Pregnancy, Contraception, Family Planning, sub-Saharan Africa

## Introduction

Studies continue to document large numbers of women who experience unintended pregnancies. Globally 40% of pregnancies are reported to be unintended (Malarcher et al. 2010). Developing countries experience the highest incidence of unintended, accounting for 80 million annually (Singh and Darroch 2012). In sub-Saharan Africa, unintended pregnancy accounts for 45 % of all pregnancies. An unintended pregnancy is a pregnancy that is mistimed, or unwanted at the time of conception (Santelli et al. 2003). It is a core concept to better understand the ability of the women to achieve their fertility intentions. Reducing an unintended pregnancy is an attractive policy goal that can be interpreted as rights-based. Becoming pregnant only when intended is increasingly being espoused as a basic reproductive right for women. Therefore, preventing unintended pregnancy contributes toward achieving women reproductive rights more explicitly than say reducing unmet need for contraception (Askew 2013).

Unintended pregnancy is an issue of great concern from both a human rights and a public health perspective because of its adverse health and socio-economic consequences for mothers and children (Gipson et al. 2008; Tsui et al. 2010). For mothers unwanted pregnancy has been associated with maternal mortality and morbidity, depression, drug abuse and poor antenatal and delivery care (Gipson et al. 2008) . One cause of maternal mortality and morbidity is unsafe abortion. Unsafe abortion is defined as a procedure to terminate a pregnancy that is carried out by individuals lacking the necessary

skills, or carried out in an environment that does not conform to minimal medical standards, or both (WHO 2011). Because abortion is illegal in many developing country settings, women often resort to clandestine and unsafe abortion procedures to terminate unintended pregnancies, which carry high maternal mortality and morbidity risks. For children, studies have documented adverse outcomes such as low birth weight, incomplete vaccinations, malnutrition, infant mortality risks, and inadequate breast feeding and child abuse (Gipson et al. 2008).

It is commonly believed that unintended pregnancy is mainly caused by nonuse, inconsistent or incorrect use of effective contraception. Recent estimates indicate that contraceptive use averted 218 unintended pregnancies in the developing world in 2012 (Singh and Darroch 2012). Another study estimated that one in three of the unintended pregnancies are a result of contraceptive failure (Bradley et al. 2011). As such policy statements

advocate for increasing access to contraception as a way of reducing unintended pregnancies (Askew 2013). For example, UNFPA's State of the World Population 2012 report elaborately mentions the adverse effects associated with unintended pregnancy and the need to reducing it by increasing access to family planning (UNFPA 2012). In the same vein, it is estimated that about 222 million women have unmet need for contraception and that meeting this need would prevent a further 54 million unintended pregnancies (Singh and Darroch 2012). Since the 2012 London Summit on Family Planning, policy statements and actions have also focused on reducing unmet need for family planning as an intermediary to reducing unintended pregnancy (Askew 2013).

It is, thus, expected that levels of unintended pregnancy should reduce with increases in contraceptive use. However, limited evidence suggests a counter-intuitive relationship between unintended and contraception at the global level (Tsui et al. 2010). This study aims to unpack this unexpected relationship. Identifying and explaining the relationship between unintended pregnancy and contraceptive use is policy relevant, particularly in the context of sub-Saharan Africa where contraceptive use is low and unintended pregnancies and fertility rates are high.

## Past research and research questions

High levels of unintended pregnancy in developing countries have drawn attention and concern. Unintended pregnancy is an issue of public health concern because of its adverse health and socio-economic outcomes among women and children (Askew 2013; WHO 2011). Assisting women to avoid unintended pregnancy goes a long way in improving their own health and children's and families' wellbeing as well as meeting their reproductive right to space or limit their childbearing. As such past research has understandably been focused on the consequences and determinates of unintended pregnancy on women and their children. This body of research has shown that unintended pregnancy is significantly associated with maternal and childhood mortality and morbidity (Gipson et al. 2008; Singh et al. 2012), depression and anxiety, substance and child abuse (Gipson et al. 2008), incomplete vaccination (Singh et al. 2013), and non-health facility delivery (Marston and Cleland 2003). and poor educational outcomes and future life opportunities among adolescents (Fergusson et al. 2007). Determinants of unintended pregnancy include nonuse, incorrect use, discontinuation and failure of contraception (Singh and Darroch 2012; Tsui et al. 2010). Other correlates of unintended

pregnancy include poverty/household wealth (Ikamari et al. 2013; Singh et al. 2010 ; Kassa et al. 2012) maternal age and education (Calvert et al. 2013), age at marriage, and previous births and number of living sons (Kassa et al. 2012; Cu le et al. 2004).

Given the fact that extant literature underscores the central role played by contraception in averting unintended pregnancies, it is obviously expected that the two are inversely related. However, the association between unintended pregnancy and contraceptive use is far from being straightforward. A recent study by Tsui et.al (2010) found an unexpected relationship between unintended pregnancy and modern contraceptive prevalence rate. Using 158 DHS from 1991, this study found that unintended pregnancy levels rise, rather than fall with modern contraceptive prevalence rate (see figure 1). The study concluded by calling for a new generation of studies to investigate this relationship.

Figure1: Relation between national unintended pregnancy rates and modern contraceptive rates across 158DHS, 1991-2007 (Tsui et al. 2010)
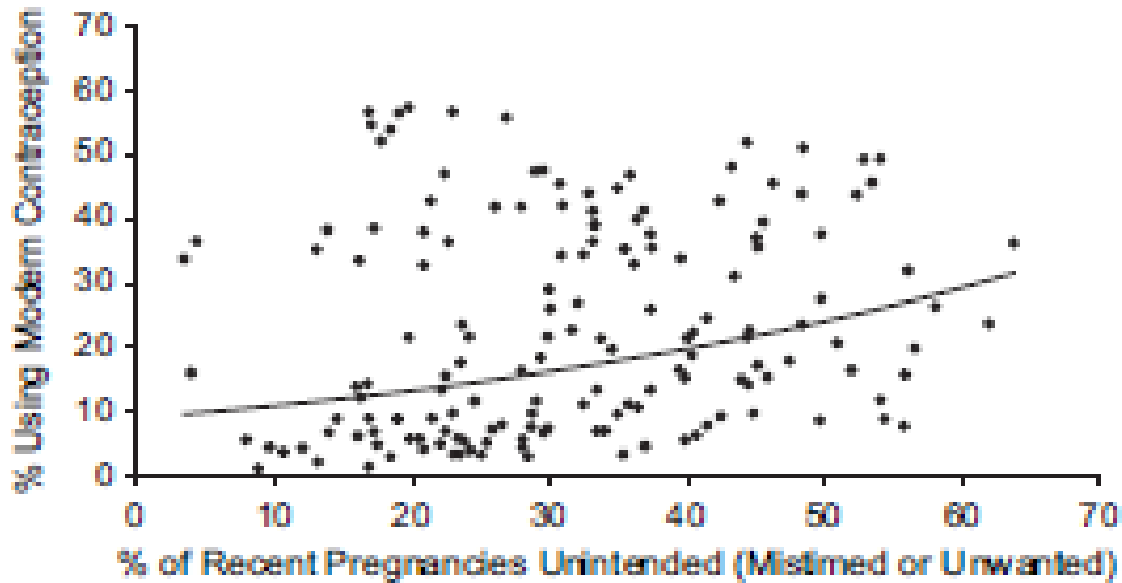


Two questions that arise from these finding are: (1) Does the relationship observed globally hold for different world regions? And (2) how has this relationship been overtime? This paper attempts to answer these questions using data from 206 DHS surveys for various developing countries and sub-Saharan Africa in particular.

## METHODS

This analysis uses DHS data sets from developing countries that were surveyed from 1991 to 2013 to plot the relationship between unintended pregnancies and modern contraceptive prevalence rates (CPR). First, the relationship is examined globally before narrowing to world regions i.e sub-Saharan Africa, Latin America and Asia using scatter plots and correlation coefficients. StatCompiler is used to derive the indicators that are used to examine this relationship using data from 206 DHS surveys for various countries and points in time. The DHS is a national representative survey that captures, among other indicators, the proportion of currently married women using a modern contraceptive method (CPR) and pregnancy wanted status (unintended or intended). Selected countries with similar socio-cultural conditions in sub-Saharan Africa and other regions are used to better explain the unintended pregnancy and CPR relationships and their evolution over time as family planning programs strengthen, contraceptive use increases and fertility preferences change. These countries are: Kenya, Uganda, Ghana, Nigeria, Bangladesh and India. indicate that the relationship with modern contraception is higher between unwanted

Unwanted and mistimed pregnancies are also separated in the analysis in order to avoid conflating their respective effects. Although unintended pregnancy is clearly defined as comprising both mistimed and unwanted pregnancies, many analyses do not make this distinction and so provide only a limited understanding of the true situation. Furthermore, mistimed and unwanted are usually aggregated together, yet they may occur at different times; mistimed are more likely at the beginning of the woman's reproductive career and unwanted are more likely at the end (D'Angelo et al. 2004). They also reflect different situations for women, with multiparous women having increased risk for unwanted pregnancies and reduced risk for mistimed pregnancies (D'Angelo et al. 2004). These two groups of women (with mistimed and unwanted) have potentially different service needs (Speizer et al. 2004), pregnancies' outcomes and precursors (D'Angelo et al. 2004).

## RESULTS

The first question is whether the positive correlation between unintended pregnancy and contraceptive prevalence still applies when the analysis is done regionally. Analyzing the relationship with more recent DHS data, the same trend obtains globally; national rates of unintended pregnancies are positively associated with contraceptive prevalence rates (figure 2). The same trend obtains even when mistimed and unwanted pregnancies are analyzed separately (figure 3). The correlation coefficients pregnancies than mistimed pregnancies. This implies that limiters are more motivated to use more

effective (modern) contraceptives methods than spacers.

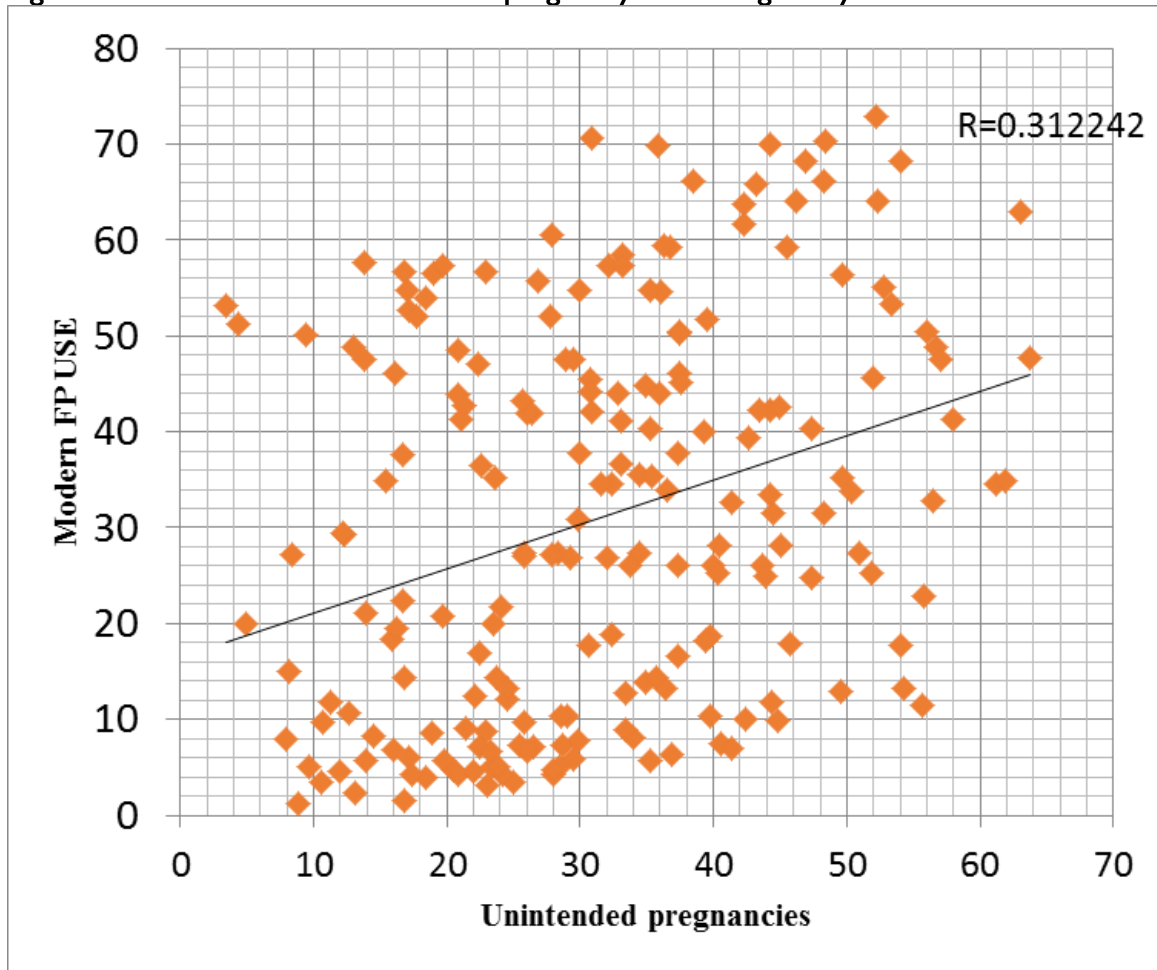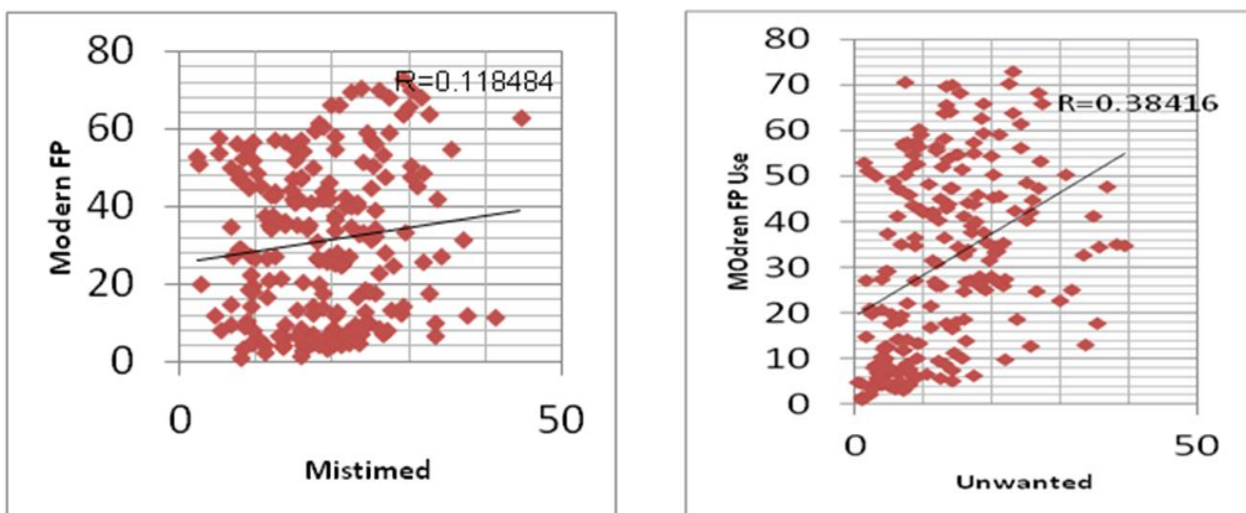**Figure 2: Relation between unintended pregnancy and CPR globally**



**Figure3: Relation between national CPR and mistimed or unwanted pregnancies globally**



A different picture, however, emerges when a regional analysis of the relationship is done for Sub-Saharan Africa; Latin America and Asia (see figure table I and figure 4). While a strong positive association is observed in sub-Saharan Africa the reverse is true for Latin America and Asia. There is a

negative relationship as expected in Asia and Latin America, although the correlation coefficients show that the relationship is stronger in Asia than Latin relationship is stronger for unwanted than mistimed pregnancies in either direction (table 1). These findings also indicate that demand to limit births has a stronger impact on contraceptive use than the America. The same trend obtains even when mistimed and unwanted pregnancies are analyzed differently although the correlations show that the demand for spacing. Taken together this implies that limiters have a stronger desire to use modern contraception to avoid pregnancy than spacers.

Table1. Correlations (coefficient) of CPR and unintended pregnancy by region

| Region | Mistimed | Unwanted | Unintended |
|---|---|---|---|
| Sub-Saharan Africa | 0.367 | 0.609 | 0.605 |
| Latin America | -0.100 | -0.398 | -0.100 |
| Asia | -0.263 | -0.500 | -0.427 |

Figure 4: Relation between unintended pregnancy and CPR in Sub-Saharan Africa
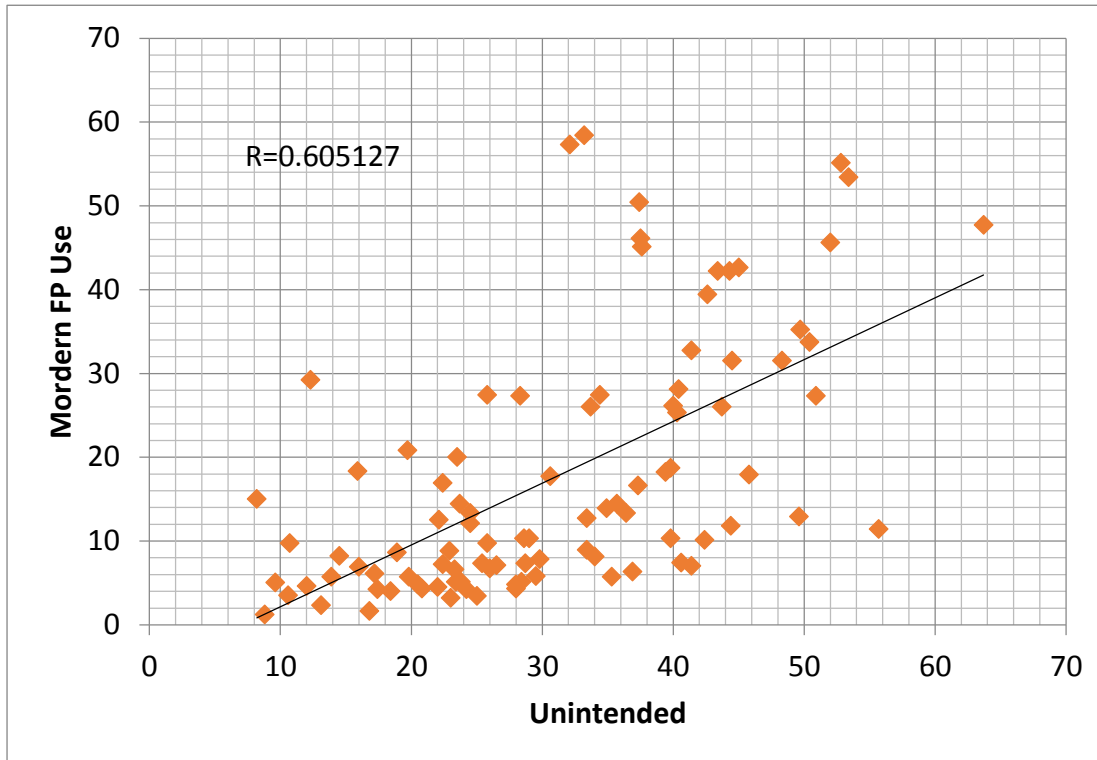


Previous analysis of the distribution of unintended pregnancies between populations within developing countries shows that the poor and less advanced experience a disproportionate higher burden (Malarcher et al. 2010; Gillespie et al. 2004). Table 2 explores this relationship further by comparing the relationship between unintended pregnancies and contraceptive prevalence rates by socio-economic status (wealth quintiles and educational level in Sub-Saharan Africa. The unexpected (positive) relationship between unintended pregnancy and contraceptive prevalence still applies even when the analysis is done by socio-economic status (wealth and education) in Sub-Saharan Africa. However, the counter-intuitive relationship is much more pronounced among the disadvantaged (poorest and un/less educated) given their higher correlation coefficients. The correlation coefficients – for unwanted are higher than mistimed pregnancies across all socio-economic groups – although the disadvantaged are most affected. This implies that failure to meet contraceptive demand for limiting is

higher than spacing, especially among the disadvantaged in sub-Saharan Africa. The negative (expected) correlation for mistimed pregnancy among the richest suggests that their contraceptive

demand for spacing is increasingly being satisfied among this group.

Table 2: Correlations (coefficient) of CPR and unintended pregnancy by socio-economic status

| Population | Mistimed | Unwanted | Unintended |
|---|---|---|---|
| Poorest | 0.442 | 0.596 | 0.591 |
| Richest | -0.011 | 0.497 | 0.385 |
| No education | 0.356 | 0.647 | 0.629 |
| Primary education | 0.145 | 0.552 | 0.458 |
| Secondary education | 0.066 | 0.396 | 0.360 |

**Trends in the association between unintended pregnancy and contraceptive rates**

The findings thus far show that the counter-intuitive relationship between unintended pregnancy and CPR applies in Saharan Africa irrespective of the socio-economic status. The relationship for other major regions of the developing is in the expected direction. The first point to note is that sub-Saharan Africa – which is still at the early stage of the fertility transition, has been compared with Asian and Latin American populations – which are at much more advanced stages of the transition. The question that follows, therefore, is: Does the stage of fertility of transition explain the relationship between unintended pregnancy and modern contraception. One way to indirectly investigate this question is to compare countries at the same stage of the transition or of the same socio-economic status, but at different stage of the transition. I, therefore, conducted further trend analysis of this relationship overtime in order to capture any pattern in selected sub-Saharan and South Asia countries of similar socio-cultural conditions ( Figure 5 and 6).

## Figure 5: Relation of CPR and unintended in Kenya and Uganda
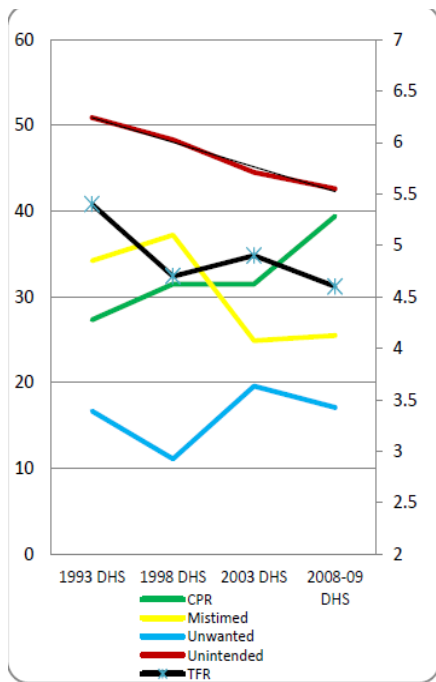
**Kenya**                                      **Uganda**
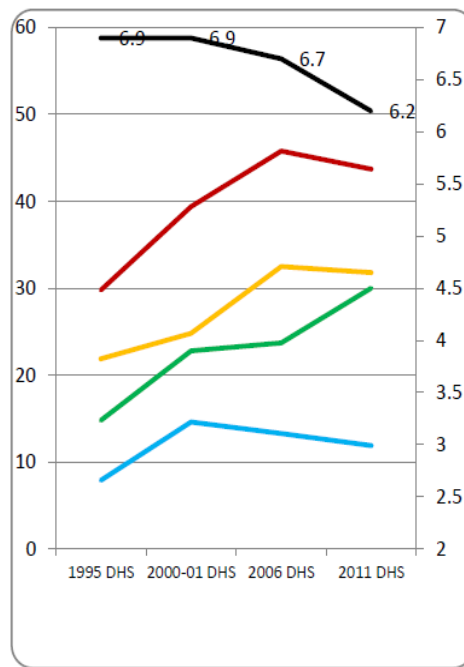


It can be seen that in Uganda, a country that is in the very stages of fertility transition, unintended pregnancies and CPR are going in the same direction. While in Kenya, which is in the middle of fertility transition, CPR and unintended pregnancies are currently moving in different directions as expected, almost approaching converging point. A similar trend is observed in Ghana. Similarly, in Nigeria CPR and unintended pregnancies went in the same direction at the onset of fertility transition before beginning to diverge.

## Figure 6: Relation of CPR and unintended in Ghana and Nigeria
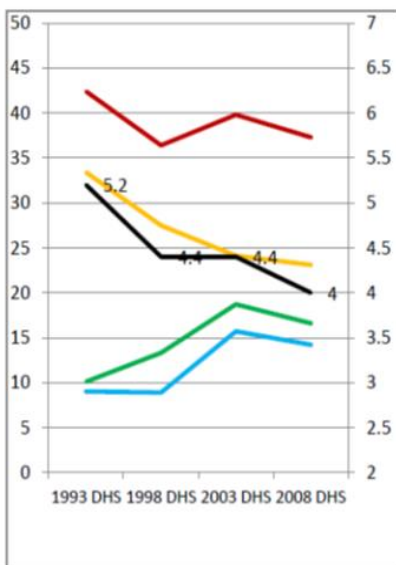
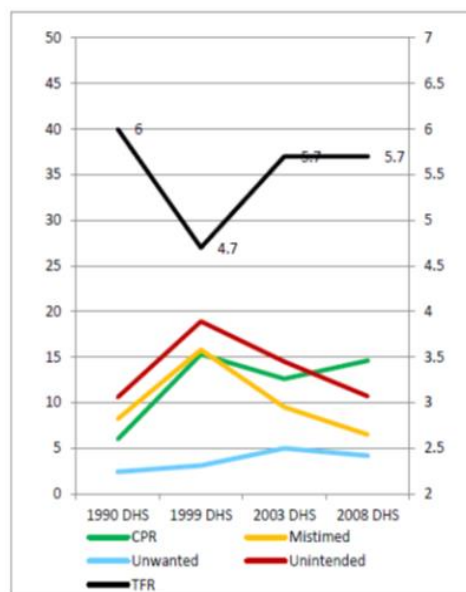**Ghana**                                      **Nigeria**

Figure 7 shows this relationship overtime in 2 countries in Asia (Bangladesh and India) of similar socio-cultural environment. These countries are much advanced in fertility transition compared to Sub-Saharan Africa. It can be seen that these countries exhibit a perfect relationship whereby as CPR grows steeply, unintended pregnancies go down in similar fashion. The second point to note is that in these countries where fertility transition is advanced, CPR is much higher than unintended pregnancy and gap continues to widen with time. The gap between contraception and mistimed and unwanted pregnancies is small and continues to narrow with time.

These findings demonstrate that the relationship of unintended pregnancy and modern contraception is a function of the stage of the demographic transition. In the early stages of fertility transition, unintended pregnancy and contraceptive use go in the same direction because the demand for contraception to space or limit fertility is higher than the capacity of the health system satisfy this demand. As fertility transition progresses overtime and family planning programs strengthen, contraceptive use increases and fertility preferences change, CPR and unintended pregnancy assume a perfect relationship and go in different directions.

**Figure 7: Relation of CPR and unintended in Bangladesh and India**

**Bangladesh**                                      **India**
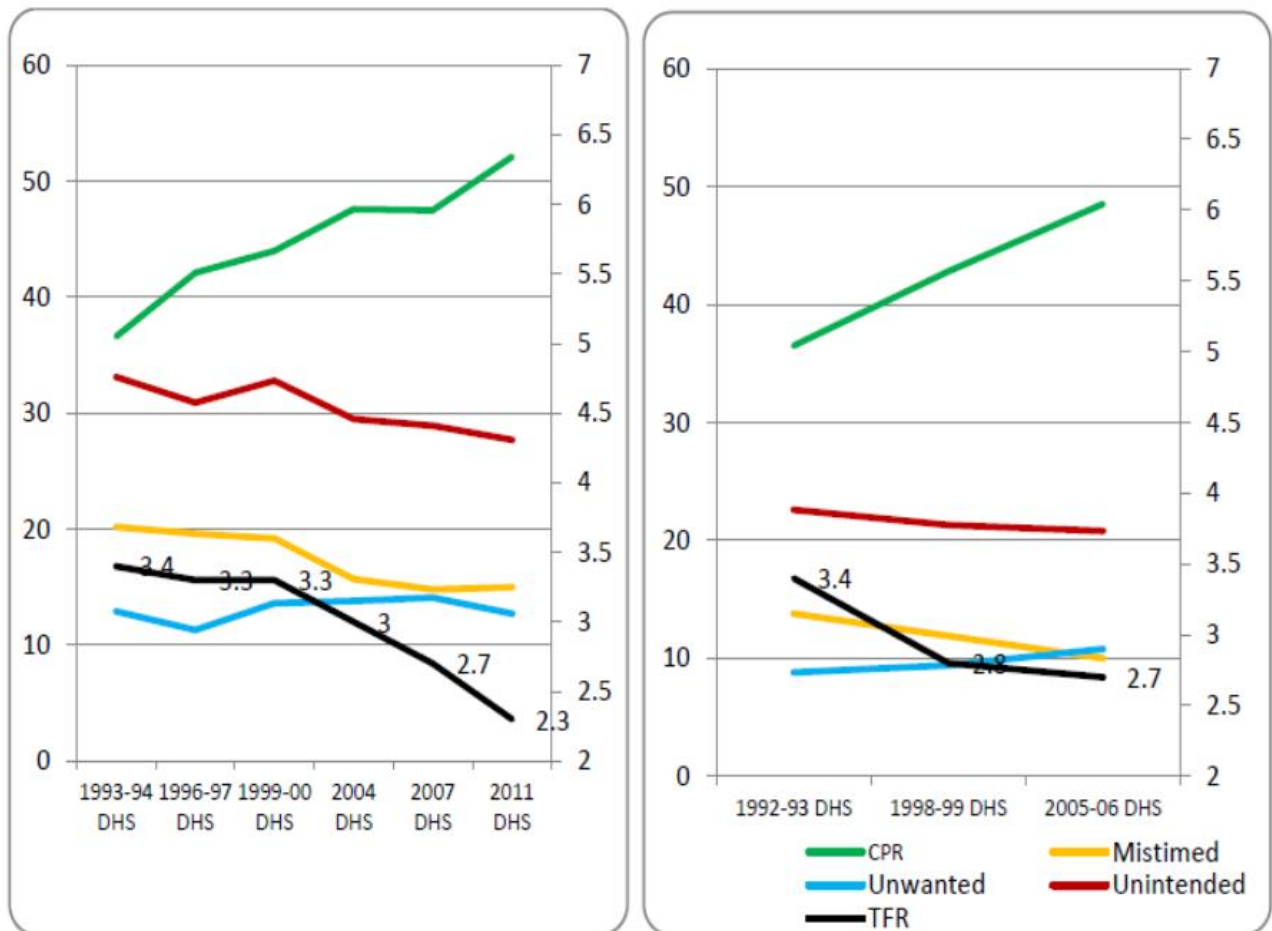
## Discussion

Reducing unintended pregnancy is a frequently stated policy objective for many national and donor organizations, with the major means for reducing unintended pregnancy being increased access to and use of effective contraception (Askew 2013; Ugal and Ushie 2013). However, at the global level, increases in CPR are often associated with increases, and not decreases, in unintended pregnancy (Tsui et al. 2010). This study was undertaken to unpack the associations between modern contraceptive use, and unintended pregnancy to better explain the relationships and their evolution over time. The study found that the counter-intuitive relation between CPR and unintended pregnancy at global was entirely a contribution of sub-Saharan Africa. When the analysis is done regionally, the relationship in Asia and Latin America is as expected.

The most important issue appears to be the fact that the populations in sub-Saharan Africa, which are in the early stages of their fertility transition and were being compared with Asian and Latin American populations at much more advanced stages of the transition. By comparing the trends of the options as studies indicate that increased method mix increases contraceptive prevalence (Ross et al. 2002).

Demand-side and supply-side barriers to contraceptive use in sub-Saharan should be overcome. These include: access, knowledge, socio-cultural barriers as well as resource constraints. Many women in sub-Saharan cite fear of side effects, health concerns, societal and familial opposition as main reasons for non-use of family planning (Cleland et al. 2006). Family planning program must address these multiple and complex issues that influence contraceptive uptake. Access barriers, especially among the disadvantaged populations (the poor and less educated) in sub-Saharan African are an issue. This study showed that the disadvantaged segments are worse off in the counter-intuitive relationship between CPR and unintended pregnancies. Last, but not least, programs should promote long acting and permanent methods, which are more effective. A recent study showed that 1 in 3 pregnancies is a result of contraceptive failure (Bradley et al. 2011).

Supporting women and couples to achieve the number, timing and spacing of their children is enabling them achieve a fundamental human right that should underpin family planning programs (Cottingham et al. 2012). Prevention of unintended pregnancy is an attractive and rights- based policy goal.

## Study Limitations

relationship overtime in selected countries in Africa and Asia, we are able to discern a clear trend where the relationship is counter-intuitive at the early stages of the transition. At the onset of fertility transition, the increased demand for contraceptive to limit or space is not satisfied. As the transition develops, with family planning programs strengthening and contraceptive use increasing, the relationship acquires the expected trend and direction. The implication of this trend is that the expected relationship will eventually be the same in sub-Saharan Africa as elsewhere in the developing.

As fertility transition progress in sub-Saharan Africa, the need for contraception to prevent unintended pregnancy is likely to increase in all probability. While contraceptive has risen in many sub-Saharan settings, it still remains low. Just 1 in 4 women of reproductive age use a modern method of contraception (PRB 2012), which exposes them to unintended pregnancy. Therefore, increasing use of contraception among these women will prevent high-risk pregnancies, thereby reducing maternal and childhood mortality (Gipson et al. 2008; Tsui et al. 2010). Programs should expand contraceptive Ideally, it would be desirable to compare the association of unintended pregnancy and contraceptive prevalence for countries at the same stage of the fertility transition. The countries of sub-Saharan Africa are in the early stages of that transition, while Asia and Latin America are more advanced. It is impossible to assemble comparable data for Asia and Latin America in early periods of their transition because contraceptive prevalence and unintended pregnancy data are not available for that time period in the DHS data set.

DHS measures unintended pregnancies using retrospective assessment of pregnancy intention, which suffers from ex post rationalization bias (Pritchett 1994; Joyce 2002). This is an aversion or reluctance for women to report births as "unwanted" after they have happened, most of which are living children at the time of the interview (Casterline and El-Zein 2007). Secondly, retrospective accounts of pregnancy intentions have been shown to suffer from temporal instability (Joyce 2002) as wanted status of a child changes post-conception/delivery. This implies that the proportions of unintended pregnancies are under-reported at the time of the interview (Koenig et al. 2006).

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