Unintended Pregnancy and Future Contraceptive Use among Slum and Non-Slum women in Nairobi, Kenya

Fotso Jean Christophe[1], Saliku Teresa[1], Ochako Rhoune[1]

[1]African Population and Health Research Center (APHRC), Nairobi, Kenya

jcfotso@aphrc.org; tsaluku@aphrc.org; rochako@aphrc.org

Worldwide, 38% of pregnancies are either unwanted or unplanned [1, 2]. In Africa, unwanted pregnancy poses a major and continuing social, health, and development challenge. It accounts for more than a quarter of the 40 million pregnancies that occur annually in the region, which could be due to contraceptive failure, non-use and to a lesser extent due to rape [3-5]. Unintended pregnancy is associated with poor maternal behaviour and birth outcomes, in many cases it contributes extensively to unsafe abortions that can result to negative health effects and consequently maternal deaths especially in developing countries already grappling with so many other health challenges [4, 6-8]. Considering the consequences, it's important to prevent unintended pregnancy by providing access to contraceptives including emergency contraception, safe abortion services and empowering women to determine their reproductive choices [4].

In Kenya, the 2008-09 Demographic and Health Survey (DHS) shows that 43 percent of births are unintended (17 percent are unwanted and 26 percent are mistimed) [9]. Some of the leading causes of unintended pregnancies are low contraceptive continuation rates, method failure, and high unmet need for contraceptives [5, 10]. Mothers who have unintended births tend to suffer non-psychotic depression (postpartum depression), feelings of powerlessness, increased time pressures, and a reduction in overall physical health [11]. They also have poorer quality relationships with all their children, tending to physically abuse them more and spend less leisure time with them [8, 12, 13]. Again, if such children are from large families, they tend to receive less education [14]. Given these factors, reducing the prevalence of unintended pregnancy has become a priority issue to policy makers keen to improve the health and well-being of women and their children [8, 15].

Globally, coverage of contraceptives is 61 percent, while unmet need for contraceptives ranges from 6 percent in Europe to 23 percent in sub-Saharan Africa [16, 17]. The 2008-09 Kenya DHS reveals that 39 percent of married women use modern family planning methods while 26

percent of the same have an unmet need for family planning (13 percent for spacing and 13 percent for limiting) [9]. This indicates that many women who are not using any contraceptives are at risk of having unintended pregnancy. Use of contraceptives reduces unintended pregnancies and abortions, and facilitates family planning/spacing of births. Effective contraception is healthy and socially beneficial for mothers, their children and households [18]. It is also estimated that investing in contraception is more cost effective compared to the cost of managing unintended pregnancy and caring for more children [8].

While it is known that contraceptive use can improve reproductive health outcomes [19], women in Kenya continue to experience a high unmet need for family planning as well as heightened risks for unintended pregnancy [9]. The experience of an unintended pregnancy has far reaching effects to the maternal, child and household wellbeing. The Alan Guttmacher Institute (1999) estimates that 56 percent of unintended pregnancies occurring to women in developing countries end in induced abortion; a major contributor to maternal mortality [20, 21]. In East Africa in 2003, one in five maternal deaths was due to unsafe abortion. The overall maternal mortality ratio in Kenya is 560 deaths per 100,000 live births [21]. A large proportion of these deaths result from unsafe abortion from unwanted pregnancies [22]. Some of the documented reasons for non-use of contraception among women include lack of access to family planning information and services, personal or religious beliefs, inadequate knowledge about the risks of pregnancy following unprotected sexual relations, limited decision-making ability with regard to sexual relations and contraceptive use, incest, and rape [4, 5, 23]. Young women and adolescents, whether married or not face deep social and psychological barriers which can also prevent them from using contraceptives [23].

Previous research indicates that reported contraceptive intentions have a strong predictive effect on subsequent contraceptive use [24]. A large proportion of those women who experience unintended pregnancy cite non-use of contraception at the time of pregnancy. According to the Kenya DHS of 2008-09, 55 percent of currently married female non-users reported that they intended to use family planning in the future, 40 percent do not intend to use it and 5 percent were not sure. Preferred method of future contraceptive use among married women was injectables (52 percent) followed by pills (12 percent) with very few women (8 percent) preferring female sterilization and implants [9]. Various studies on contraceptive use examine the determinants of contraceptive use among women in a population but few have tried to

establish the pattern of use immediately after unintended pregnancy which is believed to be an event in a woman's life with far reaching implications.

Studies have found disparities in unintended pregnancy to be associated with age, marital status, income, level of education, ethnicity, non use of contraception, drug abuse, involvement with partner who had not wanted the pregnancy among other factors [7, 25]. A study in Japan found women with unplanned pregnancies to be more likely to have repeated episodes of unplanned pregnancies [26], Kuroki, et al also found women with a history of unplanned pregnancy to be at higher risks for future unplanned pregnancy [7]. Unintended pregnancy has been attributed to contraceptive failure, efficacy of contraceptive depend on the method, for instance, intrauterine device is more effective as it does not depend on user compliance, while oral contraceptives and barrier methods that depend on the user have been found to be less effective when the user fails to comply. Usually, the choice of a contraceptive method depend on several factors like patient preferences, availability of personnel and facilities at a health facility, medical and reproductive health histories, level of education, lifestyles among other factors [4]. While access to services is a major challenge in contraceptive use, it's important to note that many advanced economies like the United States too still grapple with the same problem [4].

Despite a recorded increase in use of contraception all over the world, contraceptive use is still low among women with an average parity of 4-6. These women also have the highest lifetime risk of dying from pregnancy related causes including abortion. Their reasons for low contraceptive use range from poverty, reluctance of governments and policy makers to make contraception a priority, spousal disapproval, religious beliefs, little knowledge about contraceptives, lack of male involvement among others [4]. Two groups most at risk are adolescents and women over 35 years [7, 23, 27]. Adolescence is a stage that comes with a lot of peer pressure and curiosity about sex. Many experiment with sex thinking they will not get pregnant; again they do not consider the long term consequences of unprotected sex. Adolescents experience enormous health risks when confronted with unintended pregnancies, for instance, children born to them are more likely to be premature and of low birth weight, again due to lack of physical maturity they are more likely to suffer from obstructed labour, they also suffer from psychological depression due to negative views by society about their pregnancy which may lead to higher abortion rates among them [4].

Unlike adolescents whose first pregnancy is usually unintended, older women experience unintended pregnancy after achieving their desired number of children. Some of these older women experience problems with hormonal contraceptives while others assume they are no longer at risk of getting pregnant only to be faced with unintended pregnancy [4]. Studies found that majority of pregnancies occurring to never and formerly married women are unintended and likely to end up in abortion. This implies that marital status determines pregnancy outcome, especially when a male partner disapproves of that pregnancy [4, 28]. When these pregnancies end in abortion, many women risk maternal morbidity and mortality. It is estimated that abortion causes more than half of all maternal deaths from unintended pregnancies worldwide, in more developed countries where abortion is legal, many women can benefit from safe abortion services. In many developing countries for instance Kenya, abortion is illegal and many women with such pregnancies may seek the services from untrained persons thus worsening the situation [25, 29]. Relationship stability is also important in explaining unintended pregnancy. Couples in unstable relationship are less likely to be using contraceptives, this is especially true among adolescent relationships which are more likely to be short-lived [30]. Again, many young people may view negotiating for contraceptive use an implication for lack of trust something many teenagers do not want. Another important factor associated with unintended pregnancy is level of education. One study found an increased risk of unplanned pregnancy among women with low education while the risk decreased with an increase in the level of education [7].

While several studies have explored the issue of unintended pregnancy, they have not clearly stated how the experience of unintended pregnancy may influence contraceptive use. According to McBride et al, there are health events that motivate individuals to adopt risk-reducing health behaviours; an unintended pregnancy is one such health event that would motivate women to initiate contraceptive use to avoid repeat episodes of the same [31]. Despite this knowledge, one study conducted in the United States (US) among women aged 14-25 years at risk of unplanned pregnancy found that a history of unplanned pregnancy was not associated with use of contraception [32]. Another study among US women aged 18-44 years and at risk of unintended pregnancy found women who had experienced at least an episode of unintended pregnancy to use long acting contraceptive methods than those who had no such experience [33]. There is very little research on the influence of unintended pregnancy on future contraceptive use. Some studies have been conducted outside the developing countries context, this makes this paper is important as it will not only show the influence of unintended

pregnancy in Kenya, a developing country, but it highlights how this is a problem among women living in urban slums.

This paper holds the premise that occurrence of an unintended pregnancy is a contributory factor in deciding to take up contraception in the future. It seeks to answer the research question, "Does the experience of an unintended pregnancy influence the future use of contraceptives?" The specific objectives are to 1) Describe patterns of unintended pregnancy and contraception use; 2) Investigate the association between the unintended pregnancy and future use of modern contraceptive methods; and 3) Explore the reasons that may explain the above association.

Method

The study conducted in 2009-10 used a cross-sectional research design where women aged 15-49 years were randomly selected using a two stage sampling procedure. The study covered two slum settlements - Korogocho and Viwandani- and two non-slum settlements- Harambee and Jericho all in Nairobi. The initial stage involved a random sampling of households from the settlements. The sample of households was drawn from APHRC's Nairobi Urban Health and Demographic Surveillance System (NUHDSS) which is implemented in these settlements. The study population consists of 19, 289 and 2,919 women aged 15-49 years residing in the two slum and the two non-slum settlements, respectively. The second stage involved a simple random selection of one eligible woman in each of the sampled households. Qualitative data on xxxxx is used to examine the reasons explaining the possible relationship between experience of unintended pregnancy and use of modern contraception (**NEED TO BE EXPANDED**)

Instrument

Trained research assistants administered a detailed questionnaire to all the selected respondents. The questionnaire sought information on the respondent's social, economic, demographic, pregnancy and birth histories (including miscarriages and or abortions, stillbirths, and neonatal deaths). The study asked about pregnancy intendedness for all pregnancies mentioned by the respondent, regardless of the pregnancy outcome. In addition, information on the current use of contraception and particular methods being used was collected. Informed consent was obtained from all participants and the study was approved by KEMRI.

Data analysis

The study used univariate and bi-variate analysis to examine differences by socio-demographic characteristics. For categorical variables, differences were tested using chi square tests and a p value of .05 was considered statistically significant. A stepwise logistic regression analysis was used to examine the association between unintended pregnancies on use of current contraceptive. The outcome variable was modern contraceptive use and the independent variables were unintended pregnancy, region (slum/ non-slum), age, education level, marital status, occupation, wealth and parity of the woman. Variables included in the model were those found to be significant in previous bi-variate analysis.

Results

Sample Characteristics

A total of 1,962 women were successfully interviewed. Women whose age was unknown/missing (n=16) or who did not respond to the question on whether they were taking action to avoid pregnancy (n=73), were excluded from the sample. The working sample for this study is 1,873, distributed evenly between the slum settings (49.4%) and the non-slum areas (50.6%). Though the household wealth variable was constructed by study site (slum, non-slum), it is almost evenly distributed in the overall sample. About a quarter of women had tertiary level education, while nearly 35% had secondary-level education. Not surprising, the proportion of women with tertiary education is higher in the study sample than in urban Kenya (18%) as shown by the 2008/09 Kenya demographic and health survey (KDHS). A majority of respondents were from households with three to five members (nearly 48%), were currently married (43.4%), had given birth to one or two children (40.0%), or were aged 20-34 years (60%).

[Insert Table 1 here]

Patterns of unintended pregnancy

Table 2 shows the magnitude of unintended pregnancy in the study areas, and its association with selected background characteristics. As can be seen, about 16% of women reported that their last pregnancy was unintended (either mistimed or unwanted). There was no significant difference by study site, though the slum areas tended to display higher prevalence of unintended pregnancy. Our results show a statistically significant, graded and negative association between household wealth and unintended pregnancy, whereby the prevalence of

unintended pregnancy steadily declines with increased household wealth (p=0.000). The differentials by women's education display a similar pattern, though the strength of the association is weaker (p<0.10).

[Insert Table 2 here]

Noticeably, while the size of the household is not linked to unintended pregnancy, women's parity is strongly associated with unintended pregnancy (p=0.00). As expected the last pregnancy was wanted for almost all women with no live birth; the prevalence of unintended pregnancy rose to 26.6% among women with one or two live birth, and decline to 19% among respondents with three or more live births. The data also reveal that while 73% of unintended pregnancies were mistimed (and 27% unwanted) among women with parity one or two, pointing to unmet need for spacing, 45% of unintended pregnancies were unwanted among women with three or more live births, suggesting a high level of unmet need for stopping child bearing (not shown in Table 2). Unintended pregnancy is highest among formerly married women (25%), medium never married women (16.5%) and lowest among currently married women (12.7%), and the relationship is strongly significant (p=0.000). Our data also show that the likelihood of experiencing unintended pregnancy increases with age (p=0.000), and varies between the ethnic group, being highest among Luya and Luo (20.5%), medium among Kikuyu (14.3%) and lowest among the other groups (11.1%).

Patterns of modern contraceptive use

Table 2 also shows that modern contraceptive prevalence rate (CPR) stands at 38.3% in the study areas, with almost no difference across the slum and non-slum sites. Surprisingly, the use of modern contraception decreases with increased wealth, and the bivariate association is statistically significant at the level of 10%. The same pattern is observed on the association between wealth and CPR by study site (results not shown). Women's education and ethnicity are not statistically linked to their use of modern method of contraception. Household size and women's parity and age all display statistically significant association with use of modern contraception (p<0.001), the associations being of the same shape, with initial increase of CPR followed by a decline in all three instances. Marital status is also closely linked with use of modern CPR (p<0.001); the highest rate (53.8%) is recorded among currently married women and the lowest among never married women (24.0%).

Unintended pregnancy and contraceptive use: Any association?

From Table 2, it is apparent that women whose last pregnancy was unintended were more likely to use modern contraception, than their counterpart who did not experience unintended pregnancy or whose last pregnancy was not unintended (p=0.000). This bivariate result is also shown in Model 1 of Table 3 which illustrates the association between unintended pregnancy and use of modern contraceptive method in three models of increasing controls. In Model 2 (which controls for study site, household wealth and women's education), the association remains strong (p=0.000) and in the same direction, with women whose last pregnancy was misted or unwanted about 57% more likely to use of modern contraception, compared to those who did not experienced *unintendedness* with their last pregnancy.

[Insert Table 3 here]

The inclusion of socio-demographic variables in Model 3 results in the weakening of the link between unintended pregnancy and use of modern contraception, though it remains statistically significant (p=0.051). It is also apparent that non-slum residents are more likely to use modern contraceptive, compared with slum residents (p<0.05). This effect of poverty at the community level (non-slum being considered wealthier than slum residents) is not visible at the household and individual levels. The effect of household is in the opposite direction (as noted in the bivariate analysis) and statistically insignificant, while that of education is in the expected direction unlike in the bivariate results (the higher the level of education, the higher the likelihood of using modern contraceptive method), but fails to reach statistical significance at the level of 10%. The effect of household size depicted in the bivariate analysis is not significant in the multivariate analysis. The ethnic differences in the use of contraception are not apparent in the multivariate analysis.

As can also be seen in the Table 3, marital status, parity and age remain the strongest predictors of modern contraceptive use. The results show that currently married women are about 2.5 times as likely as their formerly or never married counterparts, to be using a modern contraceptive method (p=0.000). Use of modern contraceptive method increases with parity, with women three or higher parity women about 2.6 times more likely to use contraception, compared with those who do not have any live birth (p=0.000). Finally, women in the age group 20-34 are 3.8 times more likely than those aged 20 years or younger, and 2.8 times more likely than their older counterparts, to be using a modern method of contraception (p=0.000).

Unintended pregnancy and contraceptive use: Some of the "Whys"

Findings from the qualitative study revealed that women who reported to have had an unintended pregnancy did not want to have a repeat episode of the same. All of them expressed the agony of carrying a pregnancy that they termed 'unwanted' and therefore felt they had become wiser from the encounter. However when posed with the question of what they were doing to prevent a repeat unintended pregnancy; the response clearly divided some women into those doing something and those doing nothing to prevent another unwanted pregnancy.

There was a genuine concern or fear of a repeat unwanted pregnancy; and women attested to willingly taking up contraceptive use, regardless of whether it was modern (contraceptives known to be more effective) or traditional. Some of the modern contraceptives taken up were pills, injectables, norplant (implants), the interuterine device (IUD) and condoms. The most common reason why some women took up these modern contraceptives was that they were easily available in the neighbourhood. Hence easy access was a great determinant in their use. Some women knew their unintended pregnancy was solely due to their inconsistent use of a method; and this time round were determined to be more careful and more consciously adherent to taking their contraceptives. This was more for the pills and to some extent the injectables. There are those women who preferred to go for long term methods. These include the implants, IUD and a few went for tubal ligation (TL). Those who preferred the long term methods cited that it was safer and they were secure using these methods since it removed the constant worry of what if they fall pregnant as described by 39 years old, woman from Korogocho.

> *Int: right now, do you have any fears getting an unwanted pregnancy?*
>
> *Res: no, I don't because I have Norplant for five years before I think of children again (IDI_Koch woman, 39 years, currently married, parity 6)*

The event of unintended pregnancy has actually transformed some women, who have thence become more empowered and have gone further to use dialogue with their partners to the point of demanding that they use condoms to avoid another pregnancy as told by a 27 years woman from Jericho.

> *Res: it is affecting me and I am like I don't want it anymore. My boyfriend is telling me that I have changed, I have become rebellious, I don't want to do some things and it is due to the fact that when my mind tells me I am not protected, that is it. And so I am like if you don't want to use a condom or something, I don't want it. Sometimes we end up fighting (IDI_Jericho woman, 27 years, never married with parity 1)*

There are those who felt that they had reached the tail end of their reproductive life. For others, nature had snatched their loved ones away and found themselves widowed. Still, pregnancy was not easily ruled out. Some few women who have been widowed prefer to go for long term methods like implants or opt to use emergency contraception whenever they feel that they are at risk of pregnancy. Tubal ligation was also a preferred option for this group of women who perceived that they already had enough children. Some recounted that the previous 'unwanted' pregnancy caused them a lot of problems and their only wish was to have the tubal ligation.

Int: as we speak, do you have any fears about getting another unwanted pregnancy?

Res: I fear that but I had to go for tubal ligation (TL) so I cannot have other children now

Int: you did TL?

Res: yes

Int: wouldn't you want to get more children in future?

Res: I would have liked to have as many as possible but when I look at the problems I would go through, I am better off now

Int: you told me you are using TL as a family planning method?

Res: yes (IDI_Koch woman, 37 years, living together with partner, parity 4)

A few of the women fear another pregnancy and prefer taking up contraception because the trauma they went through in the previous pregnancy especially in contemplating procuring an abortion or even attempting it was enough for them to change their behaviour.

Int: do you have any fears getting pregnant?

Res: yes, I don't want anything to do with that at all. The mention of it alone makes me shiver

Int: why?

Res: abortion is a risky affair and anything you can happen to you; it is something you are doing but scared of the eventuality. The processes you pass before you are able to secure an abortion whether it is done by the doctor or not, are so long and the whole situation is really scaring. It is something you are conscious about that you are doing some wrong (IDI_Koch woman, 35 years, currently married, parity 4)

There are those who were not doing anything to prevent a future pregnancy albeit having encountered an unintended pregnancy and fearing a repeat of the same. Majority of these

women choose abstinence as a way to protect themselves from another pregnancy. Some of the reasons given why they deliberately avoided sex was because their boyfriend, partner or spouse was far away; they are separated or they are resting from the pregnancy. In some communities, the topic on contraception is never discussed openly and use of modern contraceptives among the youthful girls is forbidden until one is married. It is commonly perceived and believed that modern contraceptives have side effects which can be disastrous to the life of young girls and therefore best left until after marriage of birth of the first child. Therefore for girls who experienced an unintended pregnancy and still living under their strict parents' roof who do not approve use of contraceptives may not openly take up contraceptives for fear that they are still underage to begin using them.

Using of contraceptives is basically a preference and not seriously taken as a requirement. Some women did not seriously consider using contraceptives and therefore avoided being sexually active. A common belief for some is that they already have enough children, or some have learnt their lesson with the unintended pregnancy they experienced and therefore cannot repeat the mistake twice and some further justify their abstinence and express their freewill to choose to use condoms when faced with the moment of engaging in sex.

Respondents in the study who have attempted using contraceptives and had health concerns opted to get off contraceptives and rely mostly on traditional methods.

Int: what are you doing in order to avoid any unwanted pregnancy?

Res: I was using depo provera and I had some side effects

Int: what happened?

Res: for nine months, I didn't get my periods and every time we have sex, I bleed, so I decided to stop. Currently I am not doing anything at all

Int: what are you using now?

Res: I am not using anything at all

Int: do you get your periods?

Res: no, (IDI_26 year, Korogocho woman)

But others are faced with a hopeless situation whereby they do not desire an 'unwanted pregnancy', however they are currently sexually active, and find the modern contraceptives having side effects to their health; thus some reluctantly rely on traditional methods and leave

the rest to fate. Others use solitude as a weapon against another 'unwanted pregnancy'. They perceive that, so long as they are not in a relationship, then they do not foresee themselves becoming pregnant.

> *Int: Are there any efforts you are making to prevent another unwanted pregnancy?*
>
> *Res: I am not using anything because I am alone*
>
> *Int: and if you get someone else, you need to be protected?*
>
> *Res: for me to start an affair with a man again, I will have to make sure I am safe (IDI_Koch woman, 34 years, separated, parity 4)*

Generally fears of unwanted pregnancy was summarily described as not financially being able or ready to meet the costs of another pregnancy, still living under their parents' or guardians' care, and for many other women is the fear of having to bring up a child as a single parent. Interestingly, women who had unintended pregnancy and do not fear another pregnancy in the future feel that having been married since, made them secure and more accepting of a new pregnancy.

Discussion

Conclusion

References

1. Alan Guttmacher Institute: **Sharing Responsibility: Women, Society and Abortion Worldwide.** New York: Alan Guttmacher Institute; 2000.
2. Kaye D.K: **Community Perceptions and Experiences of Domestic Violence and InducedAbortion in Wakiso District, Uganda.** *Qualitative Health Research* 2006, **16:**1120-1128.
3. Islam Q.M: **Making Pregnancy Safer in Least Developed Countries: The Challenge of Delivering Available Services.** vol. XLIV: UN Chronicle; 2007.
4. Klima S Carrie: **Consequences and Solutions for a Worldwide Problem.** *Journal of Nurse-Midwifery* 1998, **43:**483-491.
5. Schunmann Catherine, Glasier Anna: **Measuring pregnancy intention and its relationship with contraceptive use among women undergoing therapeutic abortion.** *Contraception* 2006, **73:**520-524.
6. Bennett M Ian, Culhane F Jennifer, McCollum F Kelly, Elo T Irma: **Unintended rapid pregnancy and low education status: Any role for depression and contraceptive use?** *American Journal of Obstetrics & Gynecology* 2006, **194:**749-754.

7. Kuroki M L, Allsworth JE, Redding AC, Blume DJ, Peipert FJ: **Is a previous unplanned pregnancy a risk factor for a subsequent unplanned pregancy?** *American Journal of Obstetrics & Gynecology* 2008, **199:**e1-e7.
8. Crissey R Sarah: **Effect of pregnancy intention on child well-being and development: Combining retrospective reports of attitude and contraceptive use.** *Population Research and Policy Review* 2005, **24:**593-615.
9. Kenya National Bureau of Statistics (KNBS), ICF Macro: **Kenya Demographic and Health Survey 2008-09.** Calverton, Maryland: KNBS and ICF Macro; 2010.
10. Montgomery R Mark: **Comments on Men, WOmen and Unintended Pregnancy.** In *New Patterns, New Theories*: Population Council; 1996.
11. Goto Aya, Yasumura Seiji, Reich R Michael, Fukao Akira: **Factors associated with unintended pregnancy in Yamagata, Japan.** *Social Science & Medicine* 2002, **54:**1065-1079.
12. Barber J. S, Axinn W.G, Thornton A: **Unwanted Childbearing, Health, and Mother-Child Relationships.** *Journal of Health and Social Behavior* 1999, **40:**231-257.
13. Huezo C.M: **An ingredient for success: Motivation and commitment.** In *Second European Congress of Tropical Medicine, Session on Strategies for the Prevention of Unwanted Pregnancies in the Tropic* (International Planned Parenthood Federation ed. Liverpool, England; 1998.
14. Brown SS, Eisenberg L, eds.: *The Best Intentions: Unintended Pregnancy and the Wellbeing of Children and Families.* Washington DC: National Academy Press; 1995.
15. Higgins A Jenny, Hirsch S. Jennifer, Trussell James: **Pleasure, Prophylaxis and Procreation: A qualitative Analysis of Intermittent Contraceptive Use and Unintended Pregnancy.** *Perspectives on Sexual and Reproductive Health* 2008, **49:**130-137.
16. Cleland John, Blacker John, Mayhew Susannah, Campbell Oona: **The impact of population growth on the attainment of the millennium development goals.** The London School of Hygiene and Tropical Medicine; 2006.
17. Cleland John, Bernstein Stan, Ezeh Alex, Faundes Anibal, Glasier Anna , Innis Jolene: **Family planning: the unfinished agenda.** *The Lancet Sexual and Reproductive Health Series* 2006.
18. Kaunitz M Andrew: **The Importance of Contraception.** The Global Library of Women's Medicine; 2008.
19. Alan Guttmacher Institute: **Facts on Abortion and Unintended Pregnancy in Africa.** New York: Alan Guttmacher Institute; 2009.
20. Alan Guttmacher Institute: **Sharing Responsibility: Women, Society and Abortion Worldwide.** New York: Alan Guttmacher Institute; 1999.
21. World Health Organization: **Unsafe Abortion: Global and Regional Estimates o the Incidence of Unsafe Abortion and Associated Mortality in 2003.** vol. Fifth ed. Geneva: WHO; 2007.
22. Bankole Akinrinola, Singh Susheela, Haas Taylor: **Reasons Why WOmen Have Induced Abortions: Evidence from 27 Countries.** *International Family Planning Perspectives* 1998, **24**.
23. Coles S. Mandy, Makino K. Kevin, Stanwood L. Nancy: **Contraceptive experiences among adolescents who experience unintended birth.** *Contraception* 2011.
24. Curtis S. L, Westoff. C. F: **Intention to use contraceptives and subsequent contraceptive behavior in Morocco.** *Studies in Family Planning* 1996, **27:**239–250.
25. Singh Susheela, Prada Elena, Edgar K: **Induced Abortion and Unintended Pregnancy in Guatemala.** *International Family Planning Perspectives* 2006, **32:**136-145.
26. Peipert FJ, Redding AC, barber J. S, et al: **De-sign of a stage-matched intervention trial to increase dual method contraceptive use (Project PROTECT).** *Contemp Clin Trials* 2007, **28:**626-637.

27. Upson Kristen, Reed D. Susan, Prager W. Sarah, Schiff A. Melissa: **Factors associated with contraceptive nonuse among US women ages 35-44 years at risk of unwanted pregnancy.** *Contraception* 2010, **81:**427-434.
28. Mbizvo TM, Bonduelle MMJ, Chadzuka S, Lindmark G, Nystrom L: **Unplanned Pregnancies in Harare: What are the social and sexual determinants.** *Social Science & Medicine* 1997, **45:**937-942.
29. Santelli John, Rochat Roger, Hatfield-Timajchy Kendra, Gilbert Colley Brenda, Curtis Kathryn, Cabral Rebecca, Hirsch S. Jennifer, Schieve Laura: **The Measurement and Meaning of Unintended Pregnancy.** *Perspectives on Sexual and Reproductive Health* 2003, **35:**94-101.
30. Glei A Dana: **Measuring Contraceptive Use Patterns among Teenage and Adult Women.** *Family Planning Perspectives* 1999, **31:**73-80.
31. McBride CM, Emmons KM, Lipkus IM: **Understanding the potential of teachable moments: the case of smoking cessation.** *Health Education Research* 2003, **18:**156-170.
32. Matteson A. Kristen, Peipert F. Jeffrey, Allsworth Jenifer, Phipps G. Maureen, Redding A. Colleen: **Unplanned Pregnancy: Does Past Experience Influence the Use of a Contraceptive Method?** *Obstetrics & Gynecology* 2006, **107**.
33. Frost J. Jennifer, Singh Susheela, Finer B. Lawrence: **Factors Associated with Contraceptive Use and Nonuse, United States, 2004.** *Perspectives on Sexual and Reproductive Health* 2007, **39:**90-99.

Table 1. Sample Characteristics

Variables	%	N
Study site		
Slum	49.4	926
Non-slum	50.6	947
Household wealth by site		
Lowest	34.0	636
Middle	33.2	621
Highest	32.9	616
Education		
None/primary	40.1	752
Secondary	35.4	663
Tertiary	24.5	458
Household size		
1-2	10.4	195
3-5	47.6	891
6+	42.0	787
Marital status		
Currently married	43.4	813
Formerly married	15.8	296
Never married	40.8	764
Parity		
'0	32.5	608
1-2	40.0	749
3+	27.5	516
Age		
<20	12.0	224
20-34	60.0	1,124
35-49	28.0	525
Ethnicity		
Kikuyu	33.2	622
Luya	18.0	338
Luo	18.7	351
Kamba	17.5	328
Others	12.5	234
N		1,873

Table 2. Patterns of unintended pregnancy and contraceptive use

	Unintended pregancy			Current modern contraceptive use		
	No/NA[1]	Yes	Total	No	Yes	Total
Overall	83.8	16.2	100.0	61.7	38.3	100.0
Study site		p = 0.304			p = 0.998	
Slum	82.9	17.1	100.0	61.7	38.3	100.0
Non-slum	84.7	15.3	100.0	62.6	37.4	100.0
Household wealth		p = 0.000			p = 0.077	
Lowest	79.7	20.3	100.0	58.3	41.7	100.0
Middle	83.7	16.3	100.0	62.3	37.7	100.0
Highest	88.2	11.9	100.0	64.5	35.6	100.0
Education		p = 0.084			p = 0.368	
None/primary	82.1	18.0	100.0	61.7	38.3	100.0
Secondary	83.7	16.3	100.0	63.4	36.7	100.0
Tertiary	86.9	13.1	100.0	59.2	40.8	100.0
Household size		p = 0.212			p = 0.003	
1-2	80.5	19.5	100.0	69.7	30.3	100.0
3-5	85.2	14.8	100.0	58.1	41.9	100.0
6+	83.1	16.9	100.0	63.7	36.3	100.0
Marital status		p = 0.000			p = 0.000	
Currently married	87.3	12.7	100.0	46.3	53.8	100.0
Formerly married	75.0	25.0	100.0	66.9	33.1	100.0
Never married	83.5	16.5	100.0	76.1	24.0	100.0
Parity		p = 0.000			p = 0.000	
'0	99.0	1.0	100.0	81.1	18.9	100.0
1-2	73.4	26.6	100.0	51.0	49.0	100.0
3+	81.0	19.0	100.0	54.3	45.7	100.0
Age		p = 0.000			p = 0.000	
<20	94.2	5.8	100.0	90.7	9.3	100.0
20-34	82.8	17.2	100.0	54.0	46.0	100.0
35-49	81.5	18.5	100.0	65.0	35.0	100.0
Ethnicity		p = 0.003			p = 0.204	
Kikuyu	85.7	14.3	100.0	62.5	37.5	100.0
Luya	79.6	20.4	100.0	60.1	39.9	100.0
Luo	79.5	20.5	100.0	61.3	38.8	100.0
Kamba	85.7	14.3	100.0	57.9	42.1	100.0
Others	88.9	11.1	100.0	67.5	32.5	100.0
Unintended pregnancy					p = 0.000	
No				63.5	36.5	100.0
Yes				52.2	47.9	100.0
N	1,570	303	1,873	1,155	718	1,873

[1]NA: Not applicable, for women who have never been pregnant

Table 3. Multivariate results of the effects of pregnancy intendedness on current use of contraceptive method

	Model 1		Model 2		Model 3	
	Odds ratio	P-value	Odds ratio	P-value	Odds ratio	P-value
Unintended pregnancy [Ref: No/NA]						
Yes	1.60	0.000 ***	1.57	0.000 ***	1.34	0.051 †
Study site [Ref: Slum]						
Non-slum			0.92	0.460	1.41	0.015 *
Household wealth [Ref: Lowest]						
Middle			0.83	0.120	0.93	0.562
Highest			0.77	0.029 *	0.86	0.235
Education [Ref: None/primary]						
Secondary			0.97	0.782	1.10	0.458
Tertiary			1.26	0.122	1.30	0.122
Household size [Ref: 1-2]						
3-5					1.21	0.316
6+					1.33	0.149
Marital status [Ref: Currently married]						
Formerly married					0.43	0.000 ***
Never married					0.38	0.000 ***
Parity [Ref: 0]						
1-2					2.48	0.000 ***
3+					2.59	0.000 ***
Age [Ref: 20-34]						
<20					0.26	0.000 ***
35-49					0.36	0.000 ***
Ethnicity [Ref: Kikuyu]						
Luya					0.92	0.592
Luo					0.93	0.658
Kamba					0.87	0.366
Others					0.65	0.015 *

[1]NA: Not applicable, for women who have never been pregnant

†p<.10; *p<.05; **p<.01; ***p<.001