

Contraceptive practices in Nigeria: Literature review and recommendation for future policy decisions

Emmanuel Monjok¹
Andrea Smesny¹
John E Ekabua²
E James Essien¹

¹Institute of Community Health,
University of Houston, Texas, USA;

²Department of Obstetrics
and Gynecology, University
of Calabar, Nigeria

Abstract: The current prevalence rate for contraceptive use in Nigeria is approximately 11%–13%. This rate is very low in spite of the high rate of sexual activity and widespread awareness of the various contraceptive methods among Nigerian adolescence and youths. As a result there are many unintended pregnancies and illegal abortions contributing to a high maternal mortality ratio, which seems to indicate a large unmet need for contraceptive use. There is ample research evidence identifying the various factors that contribute to the low prevalence of modern contraceptive use in Nigeria, with the most common factor being the myth about the side effects of modern contraceptives. However, what is lacking is a political will in Nigeria to provide family planning programs on a much larger scale, using community-oriented approaches and communication programs, to help change the myth about the side effects of modern contraceptives. This review highlights current methods and concepts in contraception, reasons for low contraceptive use and practice in Nigeria, and the need for Nigeria to generate a political priority and a will to make a change in maternal health indicators, with the ultimate goal of providing direction to guide changes in the Nigerian Population Policy as it affects contraceptive use and family planning.

Keywords: contraceptive practice, literature review, research, Nigeria

Introduction

Unexpected or unplanned pregnancy poses a major public health challenge in women of reproductive age, especially in developing countries. It has been estimated that of the 210 million pregnancies that occur annually worldwide, about 80 million (38%) are unplanned, and 46 million (22%) end in abortion.¹ More than 200 million women in developing countries would like to delay their next pregnancy or even stop bearing children altogether,² but many of them still rely on traditional and less effective methods of contraception or use no method at all. Those who do not use any contraceptive method may lack access or face barriers to using contraception.² These barriers include lack of awareness, lack of access, cultural factors, religion, opposition to use by partners or family members, and fear of health risks and side effects of contraceptives.³

In Nigeria, unintended intercourse is the primary cause of unwanted pregnancies, and many women with unwanted pregnancies decide to end them by abortion.⁴ Since abortion is illegal in Nigeria (unless medically recommended to save a mother's life) many abortions are carried out in an unsafe environment.⁵ The consequences of these clandestine abortions are grave and can be life-threatening, often leading to maternal death.^{5–7} Abortions account for 20%–40% of maternal deaths in Nigeria.^{5–7}

Correspondence: Emmanuel Monjok
Institute of Community Health,
Texas Medical Center, University
of Houston, 1441 Moursund Street #119,
Houston TX 77030, USA
Tel +1 713 795 8321
Fax +1 713 795 8383
Email emonjok@uh.edu

Many factors contribute to unwanted pregnancy in Nigeria, and a very important factor is the low level of contraceptive use.^{8–10} In addition, a desire to limit family size to enable the family to provide a better education for the children, the increased participation of women in the labor force, and urbanization are other factors leading to the desire of Nigerian women to have a predetermined number of children.¹¹

Contraceptive prevalence rates have correlated with maternal mortality and it has been shown that countries with low contraceptive prevalence rates are also countries with very high maternal mortality ratios.¹² Nigeria has one of the highest maternal mortality ratios in sub-Saharan Africa, and ranks as the country with the second highest number of maternal deaths in the world,¹³ with illegal and unsafe abortions contributing 20%–40% of about 60,000 maternal deaths that occur yearly in Nigeria.¹⁴ Similarly, the rate of induced abortions is a good indicator of the current state of medical care and family planning in any country.¹⁵ Among Nigerian women of reproductive age, one in seven (14%) have tried to have an abortion, and one in 10 (10%) have actually ended an unwanted pregnancy,¹⁶ suggesting up to 760,000 induced abortions annually.¹⁶

The use of modern contraceptive methods translates into the prevention of unwanted pregnancy and subsequent abortions. If contraceptive use in the population increases among Nigerian men and women who are sexually active, there will be a significant reduction in unwanted pregnancies and abortions leading to reduced maternal mortality. Research in Nigeria indicates that more than 60% of women with an unplanned pregnancy are not using any form of contraception.¹⁷

This literature review of contraception use in Nigeria identifies reasons for low levels of contraceptive use, the factors responsible for this low utilization, and recommends interventions, programs, and policies to increase contraceptive utilization. In addition, the review provides recommendations and direction for future political policy changes and is intended to serve ultimately as a guide for population and demographic planning.

Materials and methods

An electronic search of the published literature was conducted using the search terms “contraceptive practice”, “contraception”, “family planning”, and “Nigeria”. This was supplemented by including search terms for the various types of contraceptive methods, eg, intrauterine contraceptive device (IUCD), hormonal contraception, female sterilization, and barrier methods, in combination with “Nigeria” and then

comparing the results with the main search to identify articles that may have been missed. PubMed, ISI web of science, PLoS Medicine, and all indexed journals on contraception, family planning, human reproduction, and obstetrics and gynecology that specifically addressed contraceptive issues in Nigeria from 1999 to 2009 were searched. An Internet Google search with the terms “contraception/contraceptive practices/family planning” and “Nigeria” was also done. Websites of international organizations and private foundations for family planning and reproductive health were also searched. Apart from the literature on current concepts in contraception, all original articles that addressed contraception in Nigeria were included in the study. The search was restricted to English language articles.

Results

Contraceptive methods and current concepts

Extensive research and rigorous clinical trials have led to improvement in existing methods of contraception and also to the development of new, more effective, and acceptable contraceptive methods with fewer side effects.¹⁸ A summary of the various contraceptive methods, their current information, and concepts is outlined in the Table 1. The table includes the mechanism of action, advantages, efficacy, and side effects of the common contraceptives in current use. Some relevant comments and information on each method are also included in the table.

Contraceptive prevalence and fertility

The prevalence of contraceptive use has increased worldwide due to the development and introduction of modern contraceptives and the establishment of organized family planning programs.¹⁹ The contraceptive prevalence rate in many developing countries rose from 9% in the 1960 to 60% in 1997,¹⁹ and this has helped in reducing the total fertility rate of some developing countries (the lifetime average number of children per woman) from 6.0 in 1960 to 3.1 in 1997.¹⁷ The proportion of Nigerian women using modern contraceptive methods rose from 3% in 1990 to 8% in 2003.¹⁷ The low rate of contraceptive use in Nigeria results in high fertility rates, particularly in the rural areas and the northern part of the country. This high fertility rate accounts for Nigeria's high maternal, infant, and neonatal mortalities, and the use of modern contraceptive methods has been reported to be very limited in the northern part of Nigeria, with only 9% of Nigerian women reported to be using these in 2003. In addition, only 3% of women from the northeast and the northwest

Table I Contraceptive methods, current information and concepts

Classification/types	Mechanism of action	Benefits/advantages	Efficacy	Side effects/comments
A. Hormonal methods				
a. COCPs containing estrogen and progestin. ⁷⁰⁻⁷⁴	Act by suppressing ovulation. Cervical mucus thickening. Induces uterine atrophy.	Regulation of abnormal menses. Cessation of primary dysmenorrhea. PID and benign breast disease prevention. Protection against endometrial and ovarian cancers (including 10–15 years after discontinuation).	0.1 pregnancies/100 women in the first year of use.	Weight gain, acne and hirsutism are minor side effects. Major side effects are venous thrombosis and myocardial infarction. Low dose formulations like Yasmin® have fewer side effects (ie, the third generation COCPs now in current use).
b. POPs containing progesterone only. ⁷⁵	Act locally on cervical mucus and uterine endometrium preventing sperm transport and implantation of the fertilized ovum. Higher doses inhibit ovulation.	Reduces the side effects of estrogen present in the COCPs.	0.1 pregnancies/100 women in the first year of use.	Same as COCPs but the POPs have reduced side effects.
c. POIs: progesterone injectables, eg, DMPA and norethisterone enanthate. ⁷⁵⁻⁷⁹	Same mechanism of action as the POPs (progesterone hormone).	Self-administration. Easy for non-physician provider administration. IM route enhances compliance. Convenient for most users. DMPA benefits include decrease incidence of endometrial and ovarian cancers, ectopic pregnancies, iron deficiency anemia and PID. It is also useful in reducing the frequency of sickling and epileptic seizures in sickle cell anemia and epileptic patients.	0.3 pregnancies/100 women in the first year of use (effect equal to female sterilization).	Menstrual irregularities (may be severe to cause discontinuation). Delay (≥ 6 months) in return of fertility after discontinuation.
d. Subdermal implants: Norplant®, Jadelle®, and Implanon® are the current implants in use. ^{77,80}	These implants release low-dose of progesterone over an extended period of time, Norplant and Jadelle for five years and Implanon for three years.	Better compliance if no discontinuation.	0.1 pregnancies/100 women in the first year of use.	Menstrual irregularities especially with Norplant®. This side effect is reduced with the newer Jadelle and Implanon. Return of fertility after Implanon is six weeks.
e. CEPIs containing estrogen and progesterone administered monthly. ⁸¹	Inhibition of ovulation.	Less menstrual irregularities than POIs and the return to fertility is shorter (within six weeks).	0.1–0.4 pregnancies/100 women in the first year of use.	Low compliance (many women may not return every month for injections).
f. EC-progesterone (LNG) EC (Postinor II®), Cu IUCD (non-hormonal EC). ⁸²	Progesterone inhibits ovulation (Postinor II) and should be taken within 72 hours of unprotected vaginal intercourse or condom failure. The IUCD prevents implantation.	Highly effective with few side effects if used correctly.	Postinor II reduces the risk of pregnancy by 85% when administered correctly (1.5 mg of LNG within 72 hours). The Cu IUCD has a failure rate of <0.1% when inserted within five days after unprotected vaginal intercourse.	Minimal side effects. Good compliance rate.

(Continued)

Table 1 (Continued)

Classification/types	Mechanism of action	Benefits/advantages	Efficacy	Side effects/comments
g. Vaginal rings: impregnated with combined estrogen and progestin hormones (Nuvaring®) or progestin (Progering®). ⁸³	Same mechanism of action as the effect of estrogen and progesterone. The hormones are released and absorbed through the vaginal epithelium into the blood stream.	Upon removal, the plasma hormone levels return to normal levels and fertility rapidly returns.	1.2–1.5 pregnancies/100 women in the first year of use.	Minimal side effects. Vaginal insertion is for three weeks with one free week for menses. After the menses a new ring is inserted.
h. TCP: contain estrogen and progestin hormones applied on the skin as a patch, eg, OrthoEvra®. ⁸⁴	Same mechanism of action as the effect of estrogen and progesterone. The hormones are released and absorbed through the skin epithelium into the blood stream.	Upon removal, the plasma hormone levels return to normal levels and fertility rapidly returns.	0.1–0.3 pregnancies/100 women in the first year of use.	Skin irritation or rash (only 2% of users). The TCP is applied for three weeks (one patch per week) followed by one free week to allow for menses. The abdomen, upper torso, upper outer arm, and buttocks are the common sites of application.
i. Male hormonal methods: testosterone or a combination of testosterone and progestin or a gonadotrophin-releasing hormone. ^{82–85}	Act by inhibiting spermatogenesis.	Rapid reversal of discontinuation without any effect on prostate volume and PSA levels.	–	Nonsteroidal methods are being investigated, including the possibility of a vaccine targeting spermatozoa and oocyte surface that are accessible to antibodies.
B. Nonhormonal methods				
a. IUCDs: the CuT380 is the most commonly used. ^{86,87}	Act by interfering with sperm survival and motility thus preventing fertilization and implantation.	CuT380 offers 10 years of protection against pregnancy.	0.1 pregnancies/100 women in the first year of use.	Menstrual irregularities. Feeling of a foreign body in some women. Abnormal vaginal discharge, vulval/vaginal itching and dislodgement of the IUCD are some of the other side effects. Newer models, eg, LNG-IUCD, frameless IUCD (Gynefix®), Cu Safe300®, Sof-T®, ICFD®, and Fincoind-350® are available.
b. Barrier methods eg, male condoms (latex or polyurethane) Female condom (FC1 and FC2) or Reddy female condom or V-Armour. Others female devices are cervical cup, the cervical diaphragm, and the Lea's vaginal shield. ^{88,90}	Act by preventing sperm cells from reaching the female cervix. But they must be used correctly and consistently for maximum effectiveness.	Offers protection against STI including HIV. The male condom is cheap and widely available and free of side effects.	Failure rate is high at 12% per year. When used with a spermicidal agent, the failure rate is reduced to about 8% per year.	Condoms are free of side effects but may fail due to leaks, tears, or slippage during intercourse and withdrawals.
C. Sterilization				
a. Female sterilization: the two commonly used methods are laparoscopic and mini-laparotomy sterilization. ^{91–94}	The fallopian tubes are permanently occluded to prevent pregnancy. This can be done after six weeks post-delivery (interval sterilization), within one week or 48 hours after delivery (postpartum sterilization) or concurrently with cesarean section.	Permanent occlusion	If fallopian tubes correctly occluded, there is good efficacy	Minimal side effects of surgical procedure only, eg, bleeding, hematoma, and surgical infection.

(Continued)

Table I (Continued)

Classification/types	Mechanism of action	Benefits/advantages	Efficacy	Side effects/comments
b. Male sterilization: two methods are the no-scalpel method and the nonsurgical vas occlusion method. ⁹⁵	The vas deferens on each side of the testes is occluded preventing the passage of sperm during ejaculation (vasectomy).	Permanent occlusion (irreversible).	Good efficacy if occlusion is done correctly.	Side effects of the surgical procedure (bleeding, hematoma chronic pain, epididymitis). Alternative vasectomy methods are under investigation aimed at improving the reversibility of the procedure.
D. FABMs				
a. Standard-day method which identifies the fertile window during the menstrual cycle. ⁹⁶	Natural family planning method based on the woman's ability to identify the most fertile days in the menstrual cycle.	Free of side effects. Cheap. Encourages union and marital dialog.	High failure rate.	Free of side effects.
b. Two-day method which identifies the fertile type of cervical secretions present during the most fertile two days. ⁹⁷	Natural family planning method based on the woman's ability to identify the most fertile days in the menstrual cycle.	Free of side effects. Cheap. Encourages union and marital dialog.	High failure rate.	Free of side effects.
E. Traditional methods				
a. Periodic abstinence.		Free of side effects.	High failure rate	Free of side effects
b. Withdrawal method (coitus interruptus).		Cheap. Encourages union and marital dialog	–	–
c. Prolonged breast feeding.			–	–

Abbreviations: COCPs, combined oral contraceptive pills; POPs, progesterone only pills; POIs, progesterone only injectables; DMPA, depot medroxy progesterone acetate; IM, intramuscular; PID, pelvic inflammatory disease; CEPIs, combined estrogen and progesterone injectables; LNG, levonorgestrel; IUCD, intrauterine contraceptive device; Cu, copper; TCP, transdermal contraceptive patch; STI, sexually transmitted infections; PSA, prostate-specific antigen; FABM, fertility awareness-based methods.

reported using a modern method, compared with 23% in the southwest.¹⁷ These data correlate well with the high fertility rate in the northern part of the country. According to the 2003 Nigeria Demographic and Health Survey, the country's overall fertility rate was 7.0 children per woman in the northeast and 6.7 children per woman in the northwest, compared with only 4.1 in the southwest.¹⁷ This survey have shown that there is still a large unmet need for contraceptive use in Nigeria.¹⁷

Contraceptive knowledge, attitude and practice

Several studies in the six geopolitical zones in Nigeria indicate that contraceptive knowledge and awareness, especially among female students aged 15 to 24 years, is very high. In one study done in Ilorin,⁵ the methods mostly known by respondents were the condom (69.0%), the oral contraceptive pill (OCP, 38.8%), IUCD (29%), and periodic abstinence (32.9%), with most respondents being able to name at least one method of contraception. Unfortunately, all of the studies that showed good knowledge and awareness did not show a strong prevalence of use of contraception.^{8–10} Instead, these studies showed a high level of sexual activity corresponding

with a low contraceptive prevalence. The average age of sexual debut in many of the studies ranged between 12 and 20 years, with a mean age of 16 ± 1.2 years.^{8–10} The consequence of high sexual activity and low contraceptive use is an increased frequency of unplanned pregnancies and subsequent induced abortions or unplanned deliveries. Studies reveal that a high percentage of adolescents and young adults have had at least one unwanted pregnancy leading to induced abortion.^{5,20–22} The reasons given in these studies for not using contraceptives were fear of side effects, objections from their partner, conflicts with their religious beliefs, objections from family members, not thinking about using contraceptives, not having sexual intercourse to have a baby, and unplanned sexual debut.^{5, 8–10,17}

Sources of information on contraception

Various studies in the six geopolitical zones of Nigeria have indicated that the main sources of information about contraception, in descending order of frequency, include friends/siblings, radio/television/newspapers/magazines, school lectures/workshops/seminars, and health workers.^{5,8–10,17} The poor contribution of health workers to dissemination

of contraceptive information is worrisome. More reliable information should emanate from health workers at the family planning clinics but, in Nigeria, the family planning clinics are not young women- or adolescent-friendly.⁵ The main reason for this unfriendliness is rooted in the cultural fabric of Nigerian society where many still regard family planning services as the preserve of married people.^{4,5,8–10} In addition, discussions on sex and contraception with young persons is still considered inappropriate in Nigeria, even among health workers.^{4,5} Therefore, there is a great need in Nigeria to promote youth-friendly reproductive services to encourage sexually active young people to increase their contraceptive use. However, this must begin by mass education of the adult population in Nigeria to change the cultural norms about sex education in adolescence.

Recent observations in some centers and communities indicate staff in health centers are becoming an important source of information, especially in southern Nigeria.²³ This is probably because of the increased level of education among women and mothers in southern parts of Nigeria.²³

Sources of contraceptive supplies

Various studies in the six geopolitical zones of Nigeria have indicated that the main sources of contraceptives, in decreasing order of frequency, are patent medicine stores, pharmacy shops, friends/siblings/partners, and health facilities.^{5,8–10} Among the health facility sources, the availability of contraceptives is higher at private clinics than at government family planning and maternal health clinics or hospitals.^{5,8–10} In addition, more married than single women receive contraceptives from the government-run health facilities, including hospitals.^{5,8–10}

Studies in Ghana and Kenya have also shown that these commodities are obtained mainly from the private sector.^{24,25} In contrast, in countries like Zimbabwe and Tanzania, where there is strong government involvement in the provision of family planning services, the majority of users obtain oral contraceptives and condoms from the public sector.^{26,27} This public sector-driven commodity source of contraceptives is also seen in India and Indonesia.^{28,29}

The trend of the patent medicine shop being the most important source of contraceptive commodities in Nigeria is worrisome. The type of information obtained on contraception from a patent medicine shop is likely to be incorrect because these shops are managed by traders who themselves may have little or no knowledge of contraceptives. Unfortunately, the pharmacy shops which are managed by qualified pharmacists are few in number and are limited to the urban areas. The

patent medicine dealers, however, are more numerous and found in the vast number of rural and peripheral villages, where 60%–70% of the population resides. It is also in these rural areas that there are no practising pharmacists or doctors to advise on contraceptive choices. In most communities in Nigeria, single women are therefore more likely to obtain contraceptive information and commodities from patent medicine dealers, because single women are not culturally accepted at conventional family planning clinics, especially those run by the government.³⁰

Religion and Christian denomination have also been shown to have an influence on contraceptive usage. Research by Oye-Adeniran et al³⁰ has shown that while the Roman Catholics get their contraceptives mostly from patent medicine shops, the majority of Christians get theirs from general hospitals. Catholic patronage of patent medicine shops and market places may be connected with a religious objection to the use of modern contraceptive methods. Muslims in the same study also patronized the patent medicine shops more often because of the reported high disapproval by Muslims of contraceptive use.³⁰

In the same survey, the age of the respondent was also important in the source of contraceptive commodity. Most adolescents used patent medicine shops, but from the age of 25 years there is a greater tendency to obtain contraceptives from the private/general hospitals. This finding is largely due to societal disapproval of sex before marriage, the group to which most adolescents belong. Adolescents are also most likely to obtain condoms and OCPs over the counter at patent medicine shops where these cultural inhibitions are less evident. Unwanted pregnancy and unsafe abortions are more common among young persons (15–24 years), yet it is this same age group that Nigerian cultural forces have prevented from benefiting from adequate information regarding contraception.

Contraceptive use and choices

Contraceptive use and choices vary widely in Nigeria according to type of health facility, geopolitical zone, and within urban or rural settings. Various factors, related to both supply and demand, account for these variations and contribute to the low levels of contraceptive use and choices in Nigeria.

On the supply side are issues such as limited availability, quality, and cost of family planning services. As a consequence of limited availability, many Nigerians (particularly in rural areas) lack access to modern contraceptive and family planning services.^{31,32} In areas where services do exist,

their quality is often poor, with inadequate contraceptive supplies, insufficient numbers of trained service providers, poor interpersonal skills on the part of providers, and limited essential equipment.^{31,32}

Research on factors associated with demand for contraceptives and family planning services in Nigeria has identified the relative powerlessness of women (especially in northern Nigeria), household poverty, low level of education (especially in northern Nigeria), myths and rumors about modern contraceptive methods, parity, pronatalist attitudes, and widespread preference for male children, as key influences on contraceptive use.^{17,32} In addition to these factors, and especially in northern Nigeria, early marriages and early initiation of sexual activity have contributed significantly to the high fertility and subsequent higher prevalence of maternal and fetal complications.^{17,33} The various contraceptive choices and related issues peculiar to Nigeria are outlined below.

Condoms

According to the 2003 Demographic and Health Survey (DHS),¹⁷ the condom is reported to be the main contraceptive method known of and used by Nigerian women of reproductive age. The extensive marketing of condoms in response to the human immunodeficiency virus (HIV) epidemic, with the active involvement of both government and nongovernmental organizations, has been responsible for this increased awareness and subsequent increase in condom use. Condoms are also the preferred choice for post partum contraception, especially among educated women with high parity.¹⁷ Studies in Nigeria have indicated that because patent medicine stores are common sources of contraceptives and because condoms are readily available over the counter at these stores, there is much less restriction on contraceptive purchases and use compared with the family planning clinics and health facilities where there are more restrictions.^{5,8–10,17}

Oral contraceptive pill

As already stated above, OCPs, like the condom, are readily available over the counter at patent medicine and pharmacy shops in Nigeria. They are also available at the health facilities, and are the second contraceptive method of choice for women of reproductive age, particularly younger unmarried females and students.¹⁷ A significant problem in Nigeria is a general lack of adequate information about the OCP. The myth that prolonged use of the OCP leads to permanent sterility has limited its use in Nigeria and may

explain why most young females in Nigeria, especially students, prefer to use abortion instead of contraception for unwanted pregnancy.⁴ Also, the protective effects of OCPs are virtually unknown by the majority of women in the Nigerian population.³⁴

Intrauterine contraceptive device

The IUCD is very popular and widely used in Nigeria, particularly by older married women. Studies carried out in the Nigerian cities of Lagos,³⁵ Benin,³⁶ Ibadan,³⁷ and Ilorin³⁸ specifically concerning use of and reasons for discontinuation of the IUCD indicate that the majority of women in these areas are in the age range 31.7 ± 5.7 years with a mean parity of 4.0. The most common reason for discontinuation of IUCD use was a desire for pregnancy, especially among those younger than 35 years. Other reasons for discontinuation were side effects (mainly heavy menstrual bleeding), spousal disapproval, fear of infertility, and menopause. Experiences of “having a foreign body” or a missing IUCD and expulsion were also reasons for discontinuation. In many of these instances, the levonorgestrel IUCD should be considered because it tends to reduce menstrual bleeding and has a longer duration of action which would ultimately lead to a reduction in the high IUCD discontinuation rate. Unfortunately, the levonorgestrel IUCD is not available in Nigeria.²³ It is envisaged that the introduction of this device in many centers in Nigeria would lead to an increased acceptance of this method by multiparous and grand multiparous women.²³ IUCDs are also a common post partum contraceptive choice, especially for older women of high parity.³⁹

Hormonal contraceptive injection/implant

There are few studies in Nigeria concerning the use of hormonal contraceptive injections and subdermal implants, probably because these are not common choices. In addition, women fear the side effects of these hormonal methods of contraception, probably because of misinformation.⁴⁰ A study was conducted in Ibadan⁴⁰ which followed 810 patients who used depot-medroxyprogesterone acetate (DMPA) as a contraceptive method over a period of 11 years. Amenorrhea, menorrhagia, and metrorrhagia were the major reasons for discontinuation of DMPA in only 11% of the patients. This low discontinuation rate is indicative of the effectiveness of this method in this population which should therefore be available for suitable women who demonstrate estrogen intolerance.

The levonorgestrel subdermal implant (Norplant[®]), introduced in 1985, is the most commonly available

long-acting progestin-only subdermal implant in Nigeria. During its first year of use, Norplant was shown to be highly effective and safe, and is considered an acceptable contraceptive method among Nigerian women of different ethnic groups.⁴¹ The pooled Norplant continuation rate was shown to be 90.1% after 12 months, 84.9% after 24 months, and 77.1% after 36 months of use.⁴¹ Other studies on Norplant acceptability, effectiveness, common side effects, and reasons for discontinuation among Nigerian women have been carried out in Benin city,⁴² Zaria,⁴³ and Calabar.⁴⁴ These studies showed a promising future for implant contraceptives in Nigeria, particularly in the Hausa and Muslim communities of northern Nigeria where contraceptive use has been generally low.⁴³ Another study in Enugu,⁴⁵ where the subdermal Norplant was inadvertently used by women for a prolonged period of time (up to 10 years) instead of the recommended five years, showed an effectiveness rate of 100%. The most common reason for not having the implant removed at five years was forgetting the date of removal and moving to another town where removal was not possible because of lack of trained health personnel.

Subdermal implants are offered to women at family planning clinics in the tertiary/specialist hospitals, which are urban-based and staffed by gynecologists. A woman who migrates to a peripheral region or district after receiving the implant will not have access to trained health personnel at the local health center or rural hospital to remove the implant after five years. Other reasons for prolonged use of implants included inability to afford the cost of removal (after five years), the belief that the implant was still working, and, in a few instances, unavailability of implants at the health facility at the time of removal, so that women continue to use the implants after the recommended five years' duration.⁴⁵

Female sterilization

Female sterilization by tubal ligation is not a common or acceptable contraceptive choice in Nigeria. However, this method is commonly used worldwide, especially in developed countries and in some developing countries in Asia and South America.⁴⁶ Many factors can influence decision-making about sterilization in Nigeria, including religion, ignorance, and superstition based on ancient beliefs, even among more literate members of the community.⁴⁶ The acceptability of sterilization in Nigeria and other developing countries might be influenced by the high cost of the procedure, scarcity of skilled providers (especially in rural areas), and fear of surgical complications.⁴⁶ Nigerian studies have shown that the demand for tubal ligation is low, but is commonly

accepted in conjunction with another surgical procedure, such as a cesarean section or laparotomy for repair of uterine rupture.⁴⁶⁻⁴⁸ Possible surgical complications when using the Pomeroy's technique of tubal ligation via laparotomy or the mini-laparotomy route (the latter being the most common) include uterine perforation, bladder and intestinal injuries, and intra-abdominal bleeding, although the occurrence of these complications was found to be minimal.⁴⁶⁻⁴⁸

Male sterilization

Male sterilization or vasectomy is a rarity among Nigerian men. There were only two cases of voluntary vasectomy performed over a 30-year period at University College Hospital in Ibadan.⁴⁹ In a study in Jos, northern Nigeria, only 10 cases of vasectomy were recorded over a 16-year period compared with 3,675 female sterilizations.⁵⁰ Eighty percent of the men who underwent a vasectomy were well educated, with 20% of them being medical practitioners.⁵⁰ Although the procedure is simple, safe, and effective, it is not readily accepted as a method of fertility control in Nigeria.^{49,50} This low incidence has been attributed to male attitudes, whereby men are perceived to be more interested in proving their virility than in family planning.^{51,52} In addition, Nigerian men are afraid that vasectomy will hurt their sex drive, which they treasure for fertility reasons, especially in polygamous relationships.⁵⁰ For these reasons, very few men in Nigeria who know about this method would choose it as a contraceptive method.⁴⁹

Emergency contraception

Knowledge and attitudes towards the use of emergency contraception (EC) have been reported by a national cross-sectional survey of the Nigerian population. The various groups surveyed included unmarried women in the community,⁵³ female undergraduate students,⁵⁴ health care providers,⁵⁵ private medical practitioners,⁵⁶ and men.^{57,58} All studies concluded that there is very poor knowledge of EC in Nigeria, even among private medical practitioners. There are very few programs in Nigeria designed to increase the awareness of EC in spite of the very high maternal mortality rate associated with induced abortions which occur as a consequence of unwanted pregnancies.⁵⁹ In a cross-sectional sample of potential providers of EC conducted by the Society for Family Health,⁶⁰ 81% approved of EC. The reasons cited for disapproval of EC in this study included religion (5%), potential side effects (3%), and the belief that EC leads to permanent infertility (29%).⁶⁰ In the same Society for Family Health survey, only 8% of the providers had training in EC, only two providers knew both the correct dose and correct timing of EC, and no provider

knew both the correct dose and timing for Postinor®. Private medical practitioners provide a substantial proportion of family planning and reproductive health services in Nigeria, but the study by Okonofua et al⁵⁶ showed that while 79.9% of doctors correctly described EC methods, only 23% reported that they had EC products in their clinics, and only 13.8% used the correct brand and doses currently available in Nigeria. Similarly a large proportion of the doctors did not know the exact timing of EC in relation to sexual intercourse, while only a few gave correct names and dosages of administration. Traditional fertility methods for post-coital EC use in Nigeria include use of gin, codeine tablets, and potash mixed with blue and lime taken with pepper seeds.⁶⁰

Unwanted pregnancy, abortion and contraception

Many Nigerian women of reproductive age experience an unwanted pregnancy and resort to abortion.⁴ According to a DHS survey of women in southwestern and northern Nigeria, at least 20% reported having experienced an unwanted pregnancy.¹⁷ The 2003 DHS found that of the total live births reported in the three years prior to 2003, 15% were also reported to be unplanned.¹⁷ A community-based survey of 2,093 women aged 15–49 years about the factors associated with unwanted pregnancy was conducted in eight states of Nigeria in 2002–2003.⁶² The results indicated that 28% of women reported having an unwanted pregnancy and, of that 28%, half reported having attempted to end their last unwanted pregnancy. Forty-three percent of the women who sought an abortion did so because they were either not married, too young, or still in school. Of the women who were not practising contraception, 44% said they were unaware of family planning services, 22% stated that they did not have access to contraceptive services, contraceptive services were too expensive, or they were afraid of side effects. Therefore, at the time of that survey, 27% were at risk of unwanted pregnancy and almost 50% were unaware of contraceptive methods. Unwanted pregnancy is the leading cause of unsafe abortion in Nigeria. Abortions contribute to 20%–40% of all maternal deaths, constitute an economic drain on the Nigerian health system, are expensive for women,⁶³ especially for those who develop complications leading to pelvic inflammatory disease (PID), infertility and/or ectopic gestation.⁶³ It has also been noted that some women use abortion as a means of child spacing instead of using modern contraception.⁴ Fear of future infertility was the overriding factor in adolescents' decisions to rely on abortion rather than contraception.⁴ Many perceived the adverse effect of modern contraceptives on

fertility to be continuous and prolonged, while abortion was seen as an immediate solution to an unplanned pregnancy.⁴ Despite the legal restriction on abortion in Nigeria, 27% of physicians in private practice perform the procedure.⁶³ Indirect evidence from the 1990 and 2003 DHSs suggests that the number of abortions occurring in Nigeria is on the increase. For example, the percentage of women aged 21–24 years who had premarital sex before the age of 20 years, making them likely to be at risk of unwanted pregnancy during their adolescent years, increased from 27% in 1990 to 32% in 2003.¹⁷ In both surveys, contraceptive use remained low, with the 2003 DHS suggesting that only 13% of married women used any contraceptive method.

Incidental medical conditions and contraception

The World Health Organisation medical eligibility criteria for contraceptive use^{64,65} provide evidence-based recommendations on whether or not an individual can safely use a particular contraceptive method. A visit to a family planning clinic is important because it provides an opportunity for screening and diagnosis of incidental medical conditions in presumably otherwise healthy women.⁶⁴ For many apparently healthy young women in most parts of Nigeria, a visit to a family planning clinic may be their first contact with a health care facility. In a study done in Calabar,⁶⁶ incidental medical findings were diagnosed in 26.9% of women presenting for screening, and reproductive tract infections constituted 51.1% of the medical disorders. However, this study also showed that incidental medical conditions could be a barrier to contraceptive acceptance and use because of poverty, with low contraceptive use being more significant in women with high parity and low socioeconomic status.

The prevailing poverty in Nigeria works against the benefits of early diagnosis of incidental medical conditions at a family planning clinic, eg, malignancy of the female genital tract and heart disease. Early diagnosis and prompt treatment should be an advantage but, as a result of poverty, many of these women default and are lost to follow-up.⁶⁶

Nigeria population policy and contraception

The Federal Government of Nigeria adopted the National Policy on Population for Development, Unity, Progress, and Self-Reliance in 1988.⁶⁷ A revised policy in 2004 has included the aim of reduction of maternal deaths by 75% in 2015 in accordance with the Millennium Development Goal Number 5.⁵¹ The National Policy on Population back in

1988 encouraged open discussion and promotion of family planning. The goals of the policy were to improve the standard of living of Nigerians, promote health and welfare of the people through the reduction of deaths and disease among women and children, achieve a lower population growth rate through voluntary fertility regulation, and stem the population drift to urban areas.⁶⁷ The specific targets related to family planning were to:

- Reduce the number of pregnancies in women less than 18 years of age and above 35 years of age by 50% in 1995 and by 90% in 2000.
- Reduce by 50% the proportion of women bearing more than four children in 1995 and by 80% in 2000.
- Extend the coverage of family planning services to 50% of women of child-bearing age by 1995 and to 80% by 2000.
- Reduce total fertility rate to 4.0 by the year 2000 and reduce the population growth rate from about 3.0% per year to 2.5% by 1995 and 2.0 by the year 2000.

An evaluation of the policy and the specific targets of the Nigerian Population Policy (NPP) by Adekunle et al⁵² indicate a total failure of all set targets for the year 2000. The population has continued to grow at an annual rate of approximate 3.0% and is now estimated to be about 148 million. The contraceptive prevalence rate, currently at 11%–13%, is far from the estimated 80% expected in 2000. The total fertility rate, although decreased from 6.2 in the earlier half of the decade, is still far from the targeted 4.0.⁵² The reasons for the policy's failure are an underestimation of the huge financial resources required for its implementation, the lack of political will, poor and uncoordinated organizational strategies, "gender-divide" (reducing women's fertility to four children, while leaving men free to have as many as children as they wish), and Nigeria's prolonged political instability with frequent policy changes.⁵² In addition, the public sector and clinic-based, physician-controlled family planning programs carried out by the NPP cannot provide the needed coverage to satisfy the large unmet demand for family planning services, which is currently estimated at over 28%, involving over 4.76 million women, especially in the rural areas and northern part of Nigeria.⁵²

Discussion

This review has highlighted several important issues concerning contraception practices in Nigeria. First, contraceptive knowledge and awareness among women of reproductive age is high in Nigeria, although knowledge of emergency contraception and female sterilization is still relatively low and

male sterilization is very rare. Second, the high contraceptive knowledge and awareness is marred with very low contraceptive use. Third, the commonest source of information on contraceptives is from peer group/friends and mass media, not from health facilities, health care providers, or from school health education. Fourth, the patent medicine stores are the commonest place to purchase contraceptives instead of health facilities. Fifth, the most common reason for women (especially unmarried young women who are sexually active) not to use a modern contraceptive method is fear of side effects, although the male factor (husband), family objection, and religion also have a major effect. Sixth, unwanted pregnancy, especially among unmarried female students, is mostly often dealt with by illegal and clandestine abortion, instead of pregnancy prevention using modern contraceptive methods. Seventh, the NPP is very far from achieving its set goals and targets.

In addition to the above observations is the fact that most of the studies, carried out between 1999 and 2009 in the various geopolitical zones, were mainly retrospective, and analysed health facility data for women attending family planning clinics at the tertiary level. This underscores the concept and fact that the core of family planning activities is basically primary care. There have been very few programmatic and social science studies done in the rural communities where the majority of the population resides. In addition, it is significant to note that most of the studies were knowledge, attitude, and practice studies. There is a paucity of program evaluation and intervention studies that assess service delivery in terms of distribution, availability, and accessibility of modern contraceptives. There are also very few communication, health education, and information technology studies that assess the role of these modern tools in reproductive health. The relative paucity in diversity of studies is probably due to the public health sector's clinic-based, physician-controlled program approach set out in the NPP. The use of the private sector, nongovernment organizations, social marketing, and community-based distribution of contraceptives should have been adopted and supported more vigorously if the targets set out in the NPP were to be met.⁵² This, however, could have been made possible if there was strong political will and priority given to safe motherhood and fertility regulation programs in Nigeria.⁵² Family planning has had a major impact in countries like Indonesia and Mauritius, which has been attributed to early presidential support and the continued commitment of national and local leaders.^{29,52}

The Nigerian DHS results revealed that Nigerian women are now marrying later, are more interested in acquiring a formal education, and are more commonly having premarital sex.¹⁷ Several studies in Nigeria have corroborated the

DHS results, showing that more than 60% of women with unplanned pregnancies were not using contraception. The consequences of low contraceptive use among Nigerian women leads to an estimated 1.5 million unplanned pregnancies every year, with about half of these resulting in elective abortions.^{5,20–22} Serious maternal complications from unsafe abortions account for 20%–40% of about 60,000 maternal deaths occurring each year in Nigeria.^{5,20–22} Therefore, increasing the rate of contraceptive use should be the top priority in the primary prevention of unplanned pregnancies and maternal deaths in Nigeria. A strong and aggressive family planning program in Nigeria will not only reduce unplanned pregnancy but will lead to a significant reduction in maternal deaths. Nigeria currently has more maternal deaths in childbirth than any country except India.¹³ Maternal deaths are on the rise instead of on the decline, particularly in the rural areas and, more significantly, in the northeast and northwest geopolitical zones. This is strongly correlated with the lower contraceptive prevalence rate in the northern part of Nigeria compared with the southern part. A recent community strategy was initiated in 2006–2008 to increase family planning in northern Nigeria⁶⁸ where low female literacy, cultural barriers to family planning, high rates of polygamy, and early marriages have contributed to rising maternal death rates. DHS results show that the contraceptive prevalence rate was 27.8% compared with 7.7% in the same area in 2003. In addition, married men and women reported improved attitudes toward family planning, with 82% of men approving of family planning at the end of the study compared with 62% at baseline. The lesson from this project is that community-based strategies using different approaches and stakeholders can increase knowledge, acceptance, and use of family planning methods.⁶⁸ What is therefore needed in Nigeria is for such community-oriented strategies to be implemented on a grand scale at the national level.

Why is there no strong commitment to family planning and reproductive health issues in Nigeria in light of the magnitude of research information? The overall reason is lack of political prioritization and commitment to safe motherhood issues. Political priority and commitment in political science is the process of ensuring that political leaders consider an issue to be worthy of sustained attention, and support that attention with the provision of financial, human, and technical resources commensurate with the severity of the problem.⁶⁹ This was the story of the successful family planning and safe motherhood initiative in Indonesia that led to a substantial improvement in maternal health indicators. In Nigeria, the political will and commitment for family planning and safe

motherhood is grossly lacking. If the same level of political will and commitment that was given by the Nigerian federal government to changing the national capital from Lagos to Abuja is equally extended to family planning, there will be a significant reduction in unplanned pregnancies and the catastrophically high maternal death rate. Therefore, safe motherhood program activities and research have to focus not only on the sociocultural, medical, and technical dimensions as shown in this review, but also on the political dimension to bring about changes in maternal and child health indicators in Nigeria.⁶⁹

The investment in family planning in Indonesia has paid developmental dividends, because Indonesia achieved an impressive increase in contraceptive prevalence and a dramatic decline in fertility. Use of modern contraceptive methods increased in prevalence from below 5% for married women in 1967 at the start of the program to more than 60% in 2006. As a result, the total fertility rate fell by more than half, ie, from 6.0 children per woman to 2.6. In turn, this decline in fertility rate dramatically reduced population growth.²⁹ Improved acceptance of family planning has also correlated with striking improvements in maternal and child health.²⁹ Four main strategies were used to achieve these successes. They included reaching the rural areas with grass roots participation, promoting the norm of smaller families, building private sector self-reliance, and improving quality of care, all of which rely on huge human and financial resources.²⁹

The goals of the NPP are similar to those of the Indonesian government, therefore the Nigerian government needs to adopt the strategies that made the Indonesian family planning program a success. These include top-level political support, a stand-alone program, heavy investment in education and training, continuous and flexible funding, strong public-private partnership, research-based decision-making, and the long-term collaboration and effectiveness of an international external donor.²⁹

A significant component of any family planning program for Nigeria would have to be concentrated on community health education to reduce misconceptions about the side effects of modern contraceptives, which is the most common reason for nonuse of modern contraceptives in Nigeria. Another component would be the involvement of men in family planning. The NPP limits of allowing women to have up to four children and allowing males to have as many children as they wish should be looked into. Unfortunately, this “gender-divide” is deeply rooted in the polygamous nature of many traditional communities and in religion, especially in northern Nigeria. In Roman Catholic communities (more

concentrated in southern Nigeria) where the church doctrine forbids modern contraceptive methods, this religious factor and the strong male (husband) dominant factor can be dealt with by involving the clergy in the planning of mass media education programs. Door-to-door community contraceptive delivery, beginning at the village level, as was championed in Indonesia, would also be appropriate for the Nigerian program. If accessibility, availability, and, ultimately, the acceptance of modern contraceptives is to be increased significantly in the vast communities that make up the Nigerian federation, a significant investment in the education and training of more family planning providers and volunteers as well as retraining retired midwives and nurses, would have to be made. The design of an effective and sustained communication program aimed at increasing awareness of modern contraceptives to prevent unwanted pregnancies and abortions should also be an important component.³³

Research studies have provided adequate knowledge concerning the contributing factors of both supply and demand in regards to contraceptive use in Nigeria. However, no connection has been made between those involved with research at the universities and those involved with policy and governance. Research information must be shared to generate political priority with politicians and those in the halls of power so that they see and understand the need to take action. In this regard, health officials at the federal, state, and local government levels, medical associations (Society of Gynecology and Obstetricians of Nigeria, Nigerian Medical Association, Association of General and Private Medical Practitioners of Nigeria, Nigerian Nurses and Midwives Association, etc), university academics and researchers in reproductive health, influential persons, and community leaders should all contribute and work together to generate this political priority so that safe motherhood and family planning receive political attention. As a result, financial resources, sustainability, and continuity of family planning and reproductive health programs are assured.

There are a few limitations to this paper. It is possible that our review is biased because we were not able to guarantee inclusion of all the relevant published papers. Secondly, this review may miss many local studies from the 774 local government areas in Nigeria, especially those studies that are conducted by community nongovernment organizations in collaboration with local government public health departments. Thirdly, our paper might be biased because we were not able to review published documents in languages other than English. However, this is unlikely, given that Nigeria is an English-speaking country.

Summary

In summary, we have shown that there is abundant information that contraceptive knowledge and awareness is high among the Nigerian population, but this awareness has not translated into increased contraceptive use, with the end result being very low contraceptive prevalence in Nigeria. This low contraceptive prevalence correlates with high levels of unplanned pregnancies and abortions, leading to increases in the maternal mortality ratios especially in the rural areas and in northern Nigeria. The medical technology is known, and the sociocultural, religious, family, and male-dominant factors impeding contraceptive use in Nigerian societies have all been identified, but what is lacking is the generation of political priority for family planning and safe motherhood as well as the political will and commitment to make this change on a large scale, as occurred in Indonesia. With the commitment of financial and human resources as well as assistance from international organizations, public-private sector collaboration, community-oriented knowledge, acceptability, and availability of a wide range of modern contraceptive choices, the contraceptive prevalence rate will increase and should contribute to the reduction of the worst maternal health crisis in sub-Saharan Africa. This will ultimately lead to substantial reduction in population growth and poverty reduction.

Acknowledgment

The preparation of this manuscript was facilitated by National Institute of Mental Health grant number RO1 MH073361-02.

Disclosures

The authors report no conflicts of interest in this work.

References

1. Guttmacher Institute: *Sharing Responsibility: Women, Society and Abortion Worldwide*. New York, NY: The Alan Guttmacher Institute; 1999.
2. Singh S, Darroch JE, Vlassoff M, Nadeau J. *Adding it up: The benefits of investing in sexual and reproductive health*. New York, NY: The Alan Guttmacher Institute; 2003.
3. Carr D, Khan M. *The Unfinished Agenda: Meeting the needs for family planning in less developed countries*. Washington, DC: Population Reference Bureau; 2004.
4. Otoide VO, Oronsaye F, Okonofua FE. Why Nigerian adolescents seek abortion rather than contraception: Evidence from focus-group discussions. *Int Fam Plan Perspect*. 2001;27(2):77–81.
5. Abiodun OM, Balogun OR. Sexual activity and contraceptive use among young female students of tertiary educational institution in Ilorin, Nigeria. *Contraception*. 2009;79:146–149.
6. Oye-Adeniran BA, Adewole IF, Umoh AV, et al. Community-based survey of unwanted pregnancy in Southwestern Nigeria. *Afr J Reprod Health*. 2004;8(3):103–115.

7. Oriji VK, Jeremiah I, Kasso T. Induced abortion amongst undergraduate students of university of Port Harcourt. *Nig J Med.* 2009;18(2): 199–202.
8. Oye-Adeniran BA, Adewole IF, Odeyemi KA, Ekanem EE, Umoh AV. Contraceptive prevalence among young women in Nigeria. *J Obstet Gynaecol.* 2005;25:182–185.
9. Amazigo U, Silva N, Kaufman J, Obikeze DS. Sexual activity and contraceptive knowledge and use among in-school adolescents in Nigeria. *Int Fam Plan Persp.* 1997;23:28–33.
10. Okpani AOU, Okpani JU. Sexual activity and contraceptive use among female adolescents: A report from Port Harcourt. *Afr J Reprod Health.* 2000;4:40–47.
11. Bankole A, Sedgh G, Okonofua F, Imarhiagbe C, Hussain R, Wulf D. *Barriers to Safe Motherhood in Nigeria.* New York, NY: The Alan Guttmacher Institute; 2009.
12. Okonofua F. Need to intensify safe motherhood interventions in Africa. *Afr J Reprod Health.* 2003;7(3):7–12.
13. World Health Organization (WHO). Maternal mortality ratio in 2005: Estimates by UNICEF, WHO, UNFPA, World Bank. Geneva. WHO; 2005. Available from: http://www.who.int/reproductivehealth/publications/maternal_mortality_2005/index.html. Accessed on March 17, 2010.
14. World Health Organisation (WHO). Unsafe abortion. Global and regional estimates of the incidence of unsafe abortion and associated mortality in 2000. 4th ed. Geneva: WHO; 2004. Available from: <http://whqlibdoc.who.int/publications/2004/9241591803.pdf>. Accessed March 17, 2010.
15. Bartfan GY. Emergency contraception in clinical practice: Global perspective. *Int J Gynaecol Obstet.* 2000;70:49–58.
16. Bankole A, Oye-Adeniran BA, Singh S, et al. *Unwanted Pregnancy and Induced Abortion in Nigeria: Causes and consequences.* New York, NY: The Alan Guttmacher Institute; 2006.
17. National Population Commission. *Nigeria Demographic and Health Survey 2003.* Calverton, MD: National Population Commission and ORC Macro; 2004.
18. Abasiattai AM. Current concepts in contraception. *Nig J Med.* 2006;15(4):364–372.
19. D'Arcanques CM, Vogelsong K. Recent advances in family planning methods. *Archives of Ibadan Medicine.* 2002;3(1):6–9.
20. Oye-Adeniran BA, Adewole IF, Umoh AV, Fapohunda OR, Iwere N. Characteristics of abortion care seekers in South-Western Nigeria. *Afr J Reprod Health.* 2004;8:81–91.
21. Okonofua FE, Odimegwu C, Ajabor H, Daru PH, Johnson A. Assessing the prevalence and determinants of unwanted pregnancy and induced abortion in Nigeria. *Stud Fam Plann.* 1999;30(1):67–77.
22. Fawole AA, Aboyeji AP. Complications from unsafe abortion: Presentations at Ilorin. *Nig J Med.* 2002;2:77–80.
23. Abasiattai AM, Bassey EA, Udoma EJ. Profile of Intrauterine Contraceptive Device Acceptors at the University of Uyo Teaching Hospital, Uyo, Nigeria. *Ann Afr Med.* 2008;1:1–5.
24. *The Ghana Demographic and Health Survey 2003.* Calverton, MD: Ghana Population Commission and ORC Macro; 2004.
25. *The Kenyan Demographic and Health Survey 2003.* Calverton, MD: Kenya Population Commission and ORC Macro; 2004.
26. *The Zimbabwe Demographic and Health Survey 1999.* Calverton, MD: Zimbabwe Population Commission and ORC Macro; 2000.
27. Chen S, Guilkey DK. Determinants of contraceptive methods choice in rural Tanzania between 1991 and 1999. *Stud Fam Plann.* 2003;34(4):263–276.
28. Ramesh BM, Gulati SC, Retherford RD. *Contraceptive Use in India 1992–93. National Family Health Survey Subject Report No 2.* Mumbai, India: International Institute for Population Sciences Honolulu East-West Center; 1996.
29. Mize LS, Byrant R. *A 35 Years Commitment to Family Planning in Indonesia: BKKBN and USAID historic partnership.* Baltimore, MD: John Hopkins Bloomberg School of Public Health/Center for Communication Program; 2006.
30. Oye-Adeniran BA, Adewole IF, Umoh AV, et al. Sources of contraceptive commodities for users in Nigeria. *PLoS Med.* 2005;2(11):e306.
31. Askew I, Mensch B, Adewuyi A. Indicators for measuring the quality of family planning services in Nigeria. *Stud Fam Plann.* 1994;25(5): 268–283.
32. Feyisetan BJ, Ainsworth M. Contraceptive use and the quality, price and availability of family planning in Nigeria. *World Bank Economic Review.* 1996;10(1):159–187.
33. Babalola S, Folda L, Babayaro H. The effect of a communication program on contraceptive ideation and use among young women in Northern Nigeria. *Stud Fam Plann.* 2008;39(3):211–220.
34. Grubb GS. Women's perceptions of the safety of the pill: A survey in eight developing countries. *J Bio Sc.* 1987;19:313–321.
35. Odegbola O, Ogedengbe OK. The acceptance rate of intrauterine contraceptive device (IUCD) amongst family planning clinic in Lagos University Teaching Hospital (LUTH). *Nig Q J Hosp Med.* 2008;18(4):175–180.
36. Aisien AO. Intrauterine contraceptive device (IUCD): Acceptability and effectiveness in a tertiary institution. *Afr J Med Med Sci.* 2007;36(3):193–200.
37. Okunlola MA, Owonikoko KM, Roberts OA, Morhason-Bello IO. Discontinuation patterns among IUCD users at a family planning clinic, University College Hospital, Ibadan. *J Obstet Gynaecol.* 2006;26(2):152–156.
38. Olatinwo AW, Anate M, Balogun OR, Alao MO. Intrauterine contraceptive device (IUCD): Socio-demographic characteristics of acceptors, acceptability and effectiveness in a teaching hospital in Nigeria. *Niger J Med.* 2001;10(1):14–17.
39. Adegbola O, Okunowo A. Intended postpartum contraceptive use among pregnant and puerperal women at a university teaching hospital. *Arch Gynecol Obstet.* 2009;280(6):987–992.
40. Falase EA, Otolorin EO, Ladipo OA. Experience with the use of depo-medroxyprogesterone acetate in a Nigerian Population. *Afr J Med Med Sci.* 1988;17(4):209–213.
41. Ladipo OA, Akinso SA. Contraceptive implants. *Afr J Reprod Health.* 2005;9(1):16–23.
42. Aisien AO. Contraception with Levonorgestrel subdermal implants (Norplant) in Benin-city, Nigeria: A 12-year review. *Afr J Reprod Health.* 2007;11(1):90–97.
43. Haggi DN. The Norplant experience in Zaria: A ten-year review. *Afr J Reprod Health.* 2003;7(2):20–24.
44. Ekabua JE, Itam IH. The safety and complications of Norplant use in Calabar. *Trop Doct.* 2007;37(1):37–39.
45. Ezegwui HU, Oguano T, Nwogu-Ikojo EE. Prolonged use of Norplant contraceptive subdermal implants. *Int J Gynaecol Obstet.* 2005;88(2):162–163.
46. Adesiyun AG. Female sterilization by tubal ligation: A re-appraisal of factors influencing decision making in a tropical setting. *Arch Gynecol Obstet.* 2007;275(4):241–244.
47. Ezegwu HU, Nwogu-Ijogo EE. Sterilization at caesarian section in Nigeria. *Int J Gynaecol Obstet.* 2004;87:157–158.
48. Nnatu S. Female sterilization – experience in a Nigerian center. *J Obstet Gynaecol.* 1986;6(4):6262–6264.
49. Akinwuntan AL, Shittu OB. Voluntary vasectomy in a Nigerian: A rarity. *Afr J Med Med Sci.* 2008;37:289–290.
50. Mutihir JT, Ujah IAO, Ekwempu CC, Duru PH, Aisien OA. Acceptability of vasectomy in Jos, Northern Nigeria. *Trop J Obstet Gynaecol.* 2004;21(1):56–57.
51. Federal Republic of Nigeria. *National Policy on Population for Sustainable Development.* Abuja, Nigeria: Federal Government of Nigeria; 2004.
52. Adekunle AO, Otolorin EO. Evaluation of the Nigerian population policy – myth or reality? *Afr J Med Med Sci.* 2000;29:305–310.
53. Obi SN, Ozumba BC. Emergency contraceptive knowledge and practice among unmarried women in Enugu, Southeast Nigeria. *Nig J Clin Pract.* 2008;11(4):296–299.
54. Akani CI, Enyindah CE, Babatunde S. Emergency contraception: Knowledge and perception of female undergraduates in the Niger Delta of Nigeria. *Ghana Med J.* 2008;42(2):68–70.

55. Adekunle AO, Arowojolu AO, Adedimeji AA, Okunlola MA. Emergency contraception: Survey of knowledge, attitudes and practice of health care professionals in Ibadan. *J Obstet Gynaecology*. 2000;20(3):284–289.
56. Okonofua FE, Omo-Aghoja LO, Hamed AA, Osazee KA. A survey of the knowledge and practices of emergency contraception by private medical practitioners in Nigeria. *J Chinese Clin Med*. 2009;41(1):32–39.
57. Odu OO, Ijadunola KT, Komolafe JO, Adebimpe WT. Men's knowledge of and attitude with respect to family planning in a sub-urban Nigerian community. *Nig J Med*. 2006;15(3):260–265.
58. Lawoyin TO, Osinowo H, Babatunde M, et al. Family planning in rural Nigeria: A study among men. *Afr J Med Med Sci*. 2002;31(2):159–162.
59. Ellerton C, Shochet T, Blanchard K, Trussell J. Emergency contraception: A review of the programmatic and social science literature. *Contraception*. 2000;61(3):145–186.
60. Society for Family Health. *Emergency Contraception in Nigeria*. Lagos, Nigeria: Society for Family Health; 1998.
61. Glasier A, Ketting E, Palan VT, et al. Case studies in emergency contraception from six countries. *Int Fam Plan Perspect*. 1996;22:55–61.
62. Guttmacher Institute. *A Survey of Women Admitted to Public and Private Medical Facilities for Treatment of Complications of Abortion*. New York, NY: The Alan Guttmacher Institute; 2002–2003.
63. Henshaw SK, Adewole I, Singh S, Bankole A, Oye-Adenian B, Hussain R. Severity and cost of unsafe abortion complications treated in Nigerian Hospitals. *Int Fam Plan Perspect*. 2008;34(1):40–50.
64. World Health Organisation. *Improving Access to Quality care in Family Planning: Medical eligibility criteria for contraceptive use*. 3rd ed. Geneva, Switzerland: World Health Organization; 2004.
65. World Health Organisation. *Medical Eligibility Criteria for Contraceptive Use, 2008 update*; 2008.
66. Ekabua JE, Ekabua KJ, Ekanem EI, Iklaki CU. Is the process of diagnosing and treating incidental medical findings a barrier to contraceptive acceptance and use? *J Obstet Gynaecol*. 2009;29(3):237–239.
67. Federal Republic of Nigeria. *National Policy on population for Development, Unity, Progress and Self-reliance*. Lagos, Nigeria: Department of Population Activities, Federal Ministry of Health; 1988.
68. Center for Development and population activities (CEDPA): Community strategies to increase family planning in Nigeria. Abstract: 36th Annual International conference on Global Health, May 26–30 Washington DC, 2009. Available at: <http://my.globalhealth.org/ebusiness/GHCCConferenceAbstract.aspx?AbstractID=4784>. Accessed Sept 2009.
69. Shiffman J, Okonofua FE. The state of political priority for safe motherhood in Nigeria. *BJOG*. 2007;114:127–133.
70. Kubba A, Guillebaud J. Combined oral contraceptives: Acceptability and effective use. *Br Med Bull*. 1993;49:140–157.
71. Finger WR. Oral contraceptives are safe, very effective. *Network*. 1996;16(4):4–8.
72. Wright KL. Advances in hormonal contraception. *Network*. 2003;22(3):4–5.
73. Speroff L, Glass R, Kase NG. *Oral Contraception. Clinical Gynaecologic Endocrinology and Infertility*. 15th ed. Philadelphia, PA: Williams and Wilkins; 1994:715–764.
74. Sangthawan M, Taneepanichskul S. A comparative study of monophasic oral contraceptives containing either drospirone 3 mg or levonorgestrel 150 µg on premenstrual symptoms. *Contraception*. 2001;71(1):1–7.
75. Finger WR. Progestin-only injectables offer many advantages. *Network*. 1995;15(4):16–19.
76. World Health Organisation. A multi-centred phase III comparative clinical trial of depot-medroxyprogesterone acetate given three monthly at doses of 100 mg or 150 mg: Contraceptive efficacy and side effects. *Contraception*. 1986;34:223.
77. Szarewski A. What's new in contraception? *Prog Obstet Gynaecol*. 2000;14:142–145.
78. Hatcher RA, Rinehart W, Blackburn R, Geller JS, Shelton JD. *The Essentials of Contraceptive Technology*. Baltimore, MD: Johns Hopkins Bloomberg School of Public Health Population Information Program; 2003.
79. Ceulear K, Gruber C, Hayes R, et al. Medroxy-progesterone acetate and homozygous sickle cell disease. *Lancet*. 1982;2(8292):229–31.
80. Croxotto HB, Makarainen L. The pharmacodynamics and efficacy of Implanon, an overview of the data. *Contraception*. 1998;58(Suppl):915–995.
81. World Health Organization. Facts about once-a-month injectable contraceptives: *Bull World Health Organ*. 1995;71(6):677–689.
82. Kirkman R, Bigrigg A. Emergency contraception. *The Obstetrician and Gynaecologist*. 2002;4(2):60–63.
83. Population Reports. Contraceptive use. 2003; Series M. Number 17. Available from: <http://info.k4health.org/pr/m17/m17chap2.shtml>. Accessed March 19, 2010.
84. Audet MC, Moreau M, Koltun WD, et al. Evaluation of contraceptive efficacy and cycle control of a trans-dermal contraceptive patch versus an oral contraceptive: A randomized control trial. *JAMA*. 2001;285(128):2347–2354.
85. Naz RK, Rowan S. Update on male contraception. *Curr Opin Obstet Gynecol*. 2009;21:265–269.
86. Barnett B, Copper T IUD: Safe, effective, reversible. *Network*. 2000;20(1):4–5.
87. Gupta S, Kirkman R. Intra-uterine devices – update on clinical performance. *The Obstetrician and Gynaecologist*. 2002;4(1):37–43.
88. Cates W. The “ABC to Z” approach. *Network*. 2003;22(4):3–4.
89. Gallo MF, Grimes DA, Schulz KF. Non-Latex versus latex male condoms for contraception. *Cochrane Database Syst Rev*. 2003;(2):CD003550.
90. Beksinska M, Smit J. The global consultation on the female condom. Available from: www.cervicalbarriers.org. Accessed March 19, 2010.
91. Glasier A. Contraception. In: Edmonds DK, editor. *Dewhurst's Textbook of Obstetrics/Gynaecology for Postgraduates*. 15th ed. London: Blackwell Science; 1999:373–386.
92. Filshie GM. Sterilization. *The Obstetrician and Gynaecologist*. 1991;1(1):26–32.
93. Green LR, Laros RK. Postpartum sterilization. *Clin Obstet Gynecol*. 1980;28(2):647–657.
94. Population reports 2005. Transcervical female sterilization. Series M. Number 19. Available from: <http://info.k4health.org/pr/m19/m19chap10.shtml>. Accessed March 19, 2010.
95. Lohiya NK, Manivannan B, Mishra PK, Pathak N. Vas deferens, a site of male contraception: An overview. *Asian J Androl*. 2001;3:8–95.
96. Population Reports 2005: Fertility awareness-based methods. Series M. Number 19. Available from: <http://info.k4health.org/pr/m19/m19chap7.shtml>. Accessed March 19, 2010.
97. Arevalo M, Jennings V, Nikula M, Sinai I. Efficacy of the new two day method of family planning. *Fertil Steril*. 2004;82(4):885–892.

Open Access Journal of Contraception

Publish your work in this journal

Open Access Journal of Contraception is an international, peer-reviewed, open access, online journal, publishing original research, reports, reviews and commentaries on all areas of contraception. In addition to clinical research, demographics and health-related aspects, the journal welcomes new findings in animal and preclinical studies

Submit your manuscript here: <http://www.dovepress.com/open-access-journal-of-contraception-journal>

Dovepress

relating to understanding the biological mechanisms and practical development of new contraceptive agents. The manuscript management system is completely online and includes a very quick and fair peer-review system. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.