
A scoping review on the use of long-acting reversible contraceptives (LARCs) in Nigeria

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1.0 Background

Unplanned pregnancies and births are becoming prevalent in Nigeria [1]. In 2003, 14% of births in Nigeria were unplanned—mistimed (9%) or unwanted (5%) [2]. This is a higher proportion than in 1990, when 11% were unplanned [3]. Henshaw et al. [4] also estimated that 12% of all pregnancies in Nigeria (not including those that result in spontaneous abortion) end in induced abortion, and another 9% result in unplanned births. Unplanned pregnancies can reduce parents' educational attainment and earning potential [5], burden hospital systems, and government funds [1]. Hence, the need for increased use of contraceptives by Nigerian women.

A variety of contraceptive options are available. These can be grouped into three broad categories: short-acting contraceptives like pills and condoms, long-acting reversible contraceptives (LARCs) and permanent contraceptive methods (e.g. sterilization) [6].

LARCs refer to contraceptives that are reversible and require administration less than once per cycle (ie per month) [5]. They include copper and progestogen only intrauterine devices (IUDs), and progestogen-only methods of contraception (Injectables and Implants) [7,8].

LARCs have varied advantages and are among the foremost effective contraceptives. They can prevent pregnancy for 3 to 10 years independent of user action [1]. Their 'typical use' failure rates are less than 1% each year, which is about the same as their 'perfect use' failure rates [9]. When compared to other contraceptives, LARCs are statistically less likely to result in an unintended pregnancy than with short-acting reversible contraceptives and permanent contraceptive methods (e.g. vasectomy, tubal ligation) [10][11]. The primary benefit of LARCs is that their effectiveness is not dependent on client's daily adherence [12]. They are the ideal safe, long-acting, reversible, convenient contraceptives for most women including adolescents [12]. As a plus to the aforementioned advantages, they also provide benefits beyond contraception, by reducing heavy menstrual bleeding and menstrual pain [13].

Irrespective of their associated advantages, LARCs are still underutilized by Nigerian women as compared to other short-acting reversible contraceptives [2,3,14–16]. Studies in other African countries also documented deep-seated resistance to the use of modern contraceptives [17,18]. Political, religious, ethical, safety concerns, misconceptions, lack of knowledge or skills by healthcare provider, low awareness of the benefits of LARCs, and high upfront costs are major barriers to heightened use [12]. For instance, due to poor information on the use of LARCs, many healthcare providers were found reluctant to offer intrauterine contraceptive devices to women who have never had a live birth [19,20]. It is very crucial that misconceptions about LARCs are dispelled based on current evidence to increase the uptake especially among Nigerian women.

Although still under-utilized, the practice of Long-acting reversible contraception by Nigerian women have generally improved [2,3,14–16]. Currently, Injectables are the most commonly used LARC by Nigerian women [2,3,14–16].

Similar to other contraceptives, LARCs are not without side effects. Side effects/health concerns were the primary reason for discontinuing LARCs. Common side effects like changes in menstrual

cycle, irregular spotting of blood through the vagina and amenorrhea have been associated to the use of progestogen-only methods [12]. To reduce the occurrence of side-effects and promote use, LARCs should be selected based on Informed decisions. This is an important principle in the delivery of LARCs [2,3,14–16]. Women using LARCs should also be counseled, so they can cope easily with side effects, to avoid dissatisfactions and unnecessary discontinuations of the methods [2,3,14–16].

There are several challenges to the uptake of LARCs in Nigeria. The “2014 Nigeria Family Planning Blueprint” laid out the major challenges which need to be addressed systematically [21]. A range of programmatic approaches and policies in both the private and public sector emphasizing access and quality of LARCs in Nigeria have been launched to improve uptake [22]. For instance, the Marie Stopes Nigeria “BlueStar” and Society for Family Health’s Healthy Family Network social franchising programs have notably provided a large number of women with LARCs particularly, Implants and IUDs respectively [22]. Policy and advocacy are also essential tools in enhancing uptake of LARCs in Nigeria [22]. Advocacy is required at the federal level and the state level toward meaningful funding for family planning.

This study focuses on reviewing the practice of long-acting reversible contraception by Nigerian women. The aim is to discuss the trends over the years, identify the challenges to uptake of LARCs, provide policy reviews and make recommendations to address these identified barriers to uptake of LARCs by Nigerian women. The need for this review stems from the fact that available evidence has not yet been systematically appraised and condensed on the use of LARCs in Nigeria. Findings from this review will help policy makers and donors design and direct interventions that will increase LARC uptake in Nigeria.

2.0 Methodology

2.1 SEARCH STRATEGY

We systematically searched PUBMED and EMBASE, including available data from the Nigerian Demographic Health Surveys (NDHS). The search strategy included general as well as specific terms to capture the different types of LARCs such as contraceptive implants, intrauterine devices, and contraceptive injectables, including their synonyms, abbreviations, acronyms, and common brand names. We incorporated the term "Nigeria", and the names of all 36 Nigerian States, including the Federal Capital Territory (FCT), into the search strategy to retrieve studies conducted in Nigeria. There were no search restrictions placed on study intervention, comparator, or outcomes. However, appropriate filters were applied to limit the search results to human studies published in English. Each database was approached slightly differently according to its unique search configuration (see Appendix 1).

2.2 INCLUSION CRITERIA

We included original studies relating to LARCs, including but not limited to access, use, safety, efficacy, and policy issues.

2.3 EXCLUSION CRITERIA

2.3.1. Outcome: Studies assessing the effect of LARCs on non-pregnancy-related outcomes were excluded. For instance, we screened out papers investigating the impact of LARCs on electrolyte levels.

2.3.2. Study type: Abstract-only articles, reviews, and commentaries.

2.3.3. Region: Studies not conducted in Nigeria.

2.3.4. Language: Studies not published in English

2.4. STUDY SELECTION

The selection of articles was done in two phases. The initial phase involved a title and abstract screening of final search results after removal of duplicates. The second phase was a full-text assessment of papers retrieved after the initial screening to identify studies that met the eligibility criteria. The two-phased screening was conducted by two reviewers independently. Any disagreements on selected studies were discussed and resolved unanimously.

2.5 SEARCH RESULTS

The search strategy produced a total of 863 results, including five reports from DHS. After removing duplicates, 651 studies were left. Title and abstract screening retrieved 195 articles, eliminating 456 search results. Following the full-text screening, a total of 130 articles met the eligibility criteria and were included in the review. (Figure 1).

Figure 1: Prisma flow diagram showing search results.

3.0 Results

3.1 KNOWLEDGE, AWARENESS AND ATTITUDE TOWARDS LARCS:

The Knowledge of long-acting reversible contraception was relatively low in comparison with other Sub-Saharan African countries; nevertheless, there have been remarkable improvement. [2,14–16,21,23]. For instance, in 2003, only 27 percent of Nigerian women had heard of IUDs, 57 percent of Injectables and 10 percent of Implants. Nonetheless, by 2018, 46 percent of women had heard of IUDs, 82 percent of Injectables and 70 percent of Implants [2,16].

Awareness of LARCs varied with geographical location, wealth quintile and education levels. Women living in rural, and less literate North East and North West zones were least likely to be informed on any method of long-acting contraception [2,3,14–16]. In contrast, women residing in urban Southern regions, (especially South West) were well-educated on the different LARCs available to them [2,3,14–16]. Expectedly, low levels of education and household income led to reduced knowledge and awareness of LARCs [2,3,14–16].

Women obtained information on LARCs from various sources. Primarily, such information were from friends and family [24–31]. Other secondary sources include: radio/television/newspapers/magazines, school lectures/workshops/seminars and health workers [29–35]. This is interesting because first, it indicates the importance of ensuring that non-medical personnel have access to the right information on LARCs since most women are more likely to get their foremost information from informal sources [32]. Second, it also suggests that organizing community-directed outreaches centered on raising awareness and providing information on LARCs to community members may yield notable results since women are more inclined to learn about LARCs primarily from their immediate community[32].

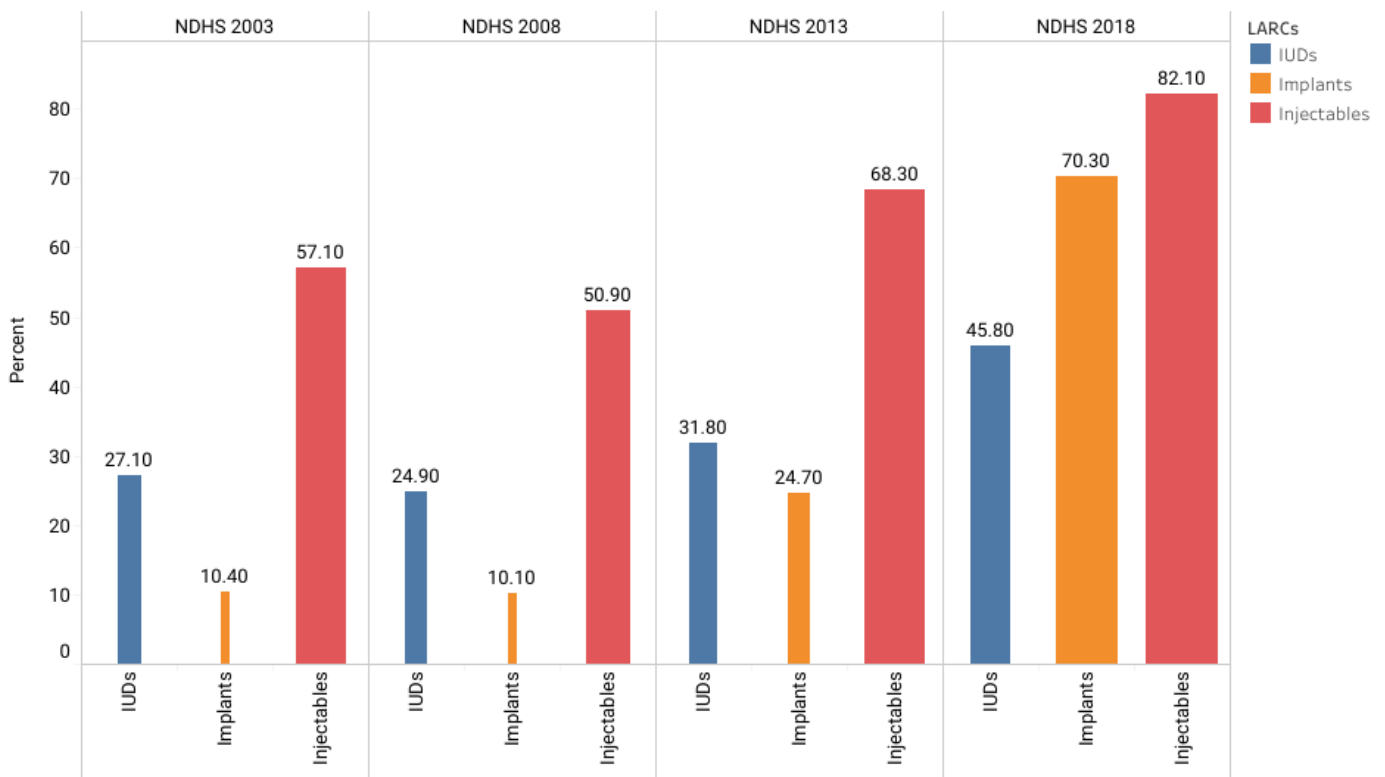
In a slightly different pattern, female students sourced their information on LARCs primarily from social media, lectures, seminars, friends, family and secondarily, from health workers [25,33,34]. This may probably be due to the academic environment [25]. The positive effect of this observation lies in the potential of increased awareness through seminar, workshops and social media adverts [25]. Copper T, Depo Provera®, Noristerat® and Implanon® were the most popular brands of LARCs [25] among female students. Female students who had previous induced abortion were significantly more knowledgeable about LARCs [25]. Their experience of an induced abortion may have triggered the quest to obtain information on more effective and reliable ways of preventing unplanned pregnancies [25]. Parents often feel uncomfortable communicating issues bothering sex or in some cases, lack adequate information on LARCs. As a result, young females are more reluctant to get information on LARCs from them [33].

Different studies had contrasting views on the influence of religion on the knowledge of LARCs. Some studies reported the effect of religious beliefs on the knowledge, awareness and subsequent use of LARCs. For instance, Christian women were reportedly more aware of LARCs than women belonging to other religions in Nigeria [27,28,35,35–39]. However, this maybe not be a true reflection nationally, as due cognizance must be taken of a possible confounding of Christianity

being the predominant religion in the regions of some of these studies [27,28,39,40]. In contrast, two studies conducted by Aduloju et al in 2021, and Orji and Odimegwu in 2002 [39,41] stated that religion, did not have any statistical significance ($P > 0.05$) on the knowledge and awareness of LARCs.

The gap between the Knowledge of LARCs and its actual usage was wide [25,39,42,43]. The implication of this is that awareness alone does not determine the utilization of LARCs by Nigerian women [25,39,42]. The common reasons for this gap include: lack of knowledge on provider centers, distance from the source of LARCs, adequate information on the benefits of LARCs, fear of possible side effects, fear of the procedure, husband disapproval, religion and culture [25,27,41].

Figure 2: Knowledge of LARC methods



Source: NDHS 2003, NDHS 2008, NDHS 2013 & NDHS 2018

The acceptance and use of LARCs was largely dependent on the attitude of women [41]. Women's attitude (positive or negative) towards LARCs was primarily determined by their level of education and number of surviving children (especially sons). Improvement in health, maintenance of a smaller family size and the fact that it made life more comfortable steered a positive attitude in women which made them four times more likely to use LARCs [41][38]. Some women frowned at LARCs because they viewed regulating their fertility as an unhealthy immoral behavior which is an affront to the God-given blessing of fertility [44–46].

Another contributing factor to the attitude of the women to LARCs was the viewpoint of health workers. For instance, although family planning and health workers may promote the use of LARCs like IUDs, some do so with reservations, advising women not to use IUDs if they have not had children before [44].

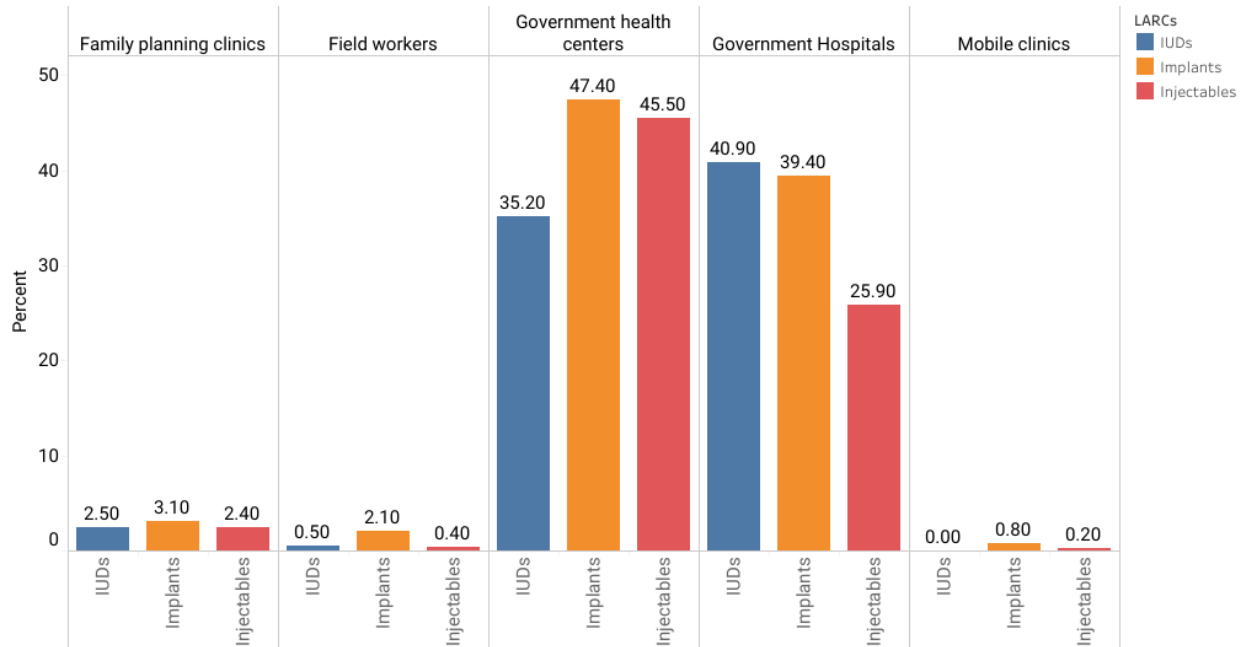
3.1 ACCESS TO LARCS

Nigerian women seek long-acting reversible contraception from both public and private sectors [2,14–16,21]. Government hospitals, government health centers and family planning clinics were major public health outlets for LARCs [2,14–16,38]. While family/private hospital/clinics and private pharmacies, popularly called “chemist shops” were popular private sector outlets [2,14–16,37]. LARCs such as IUDs, Implants, and Injectables were primarily sourced from the public sector because they require trained service delivery [2,14–16,21].

The ease of accessing LARCs, proximity of service providers and level of confidentiality offered by service providers were key considerations in choosing where to get LARCs, given that some women used LARCs without their husband’s knowledge or approval [38][47]. Patent medicine dealers and pharmacy shops being the most proximate and accessible providers were the major sources of LARCs that do not require trained medical services.

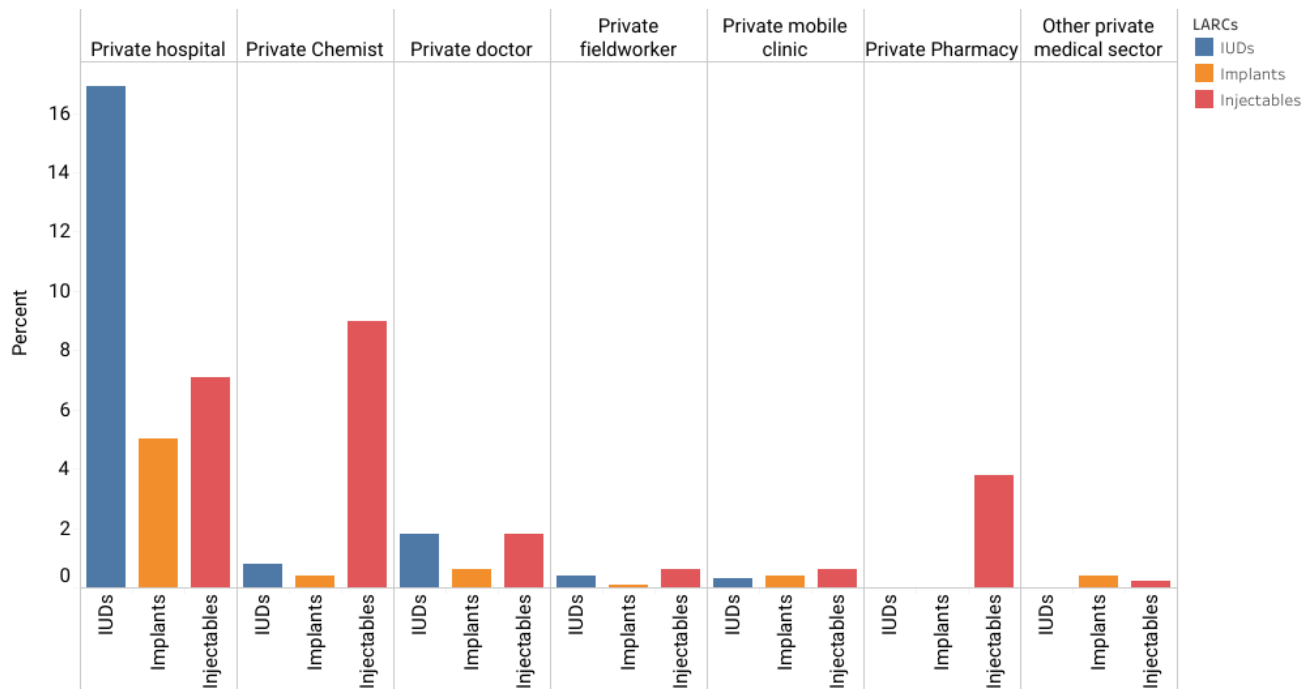
Religion and denomination also influenced the source of purchase. Oye-Adeniran et al [48] reported that while Roman Catholics purchase LARCs chiefly from patent medicine shops, the majority of other Christians procure theirs from general hospitals. The patronage of patent medicine shops by Catholics maybe associated with a religious objection to the use of modern contraceptive methods and the desire to keep their purchase of LARCs “confidential.” Similarly, Muslims patronized patent medicine shops more frequently, also due to reported high disapproval by of contraceptives [38,47,48].

Figure 3: Source of LARCs (Public Sector)



Source: NDHS 2018

Figure 4: Source of LARCs (Private Sector)



Source: NDHS, 2018

There were geographical differences in accessing LARCs. Urban dwellers procured LARCs from government hospitals, private clinics, and pharmacy shops with qualified pharmacists [47]. In contrast, rural dwellers got theirs mostly from patent medicine dealers [47], probably due to the proximity of these patent medicine shops and high cost transportation from rural to urban regions where bigger health facilities are located. This trend of the patent medicine shops being the most popular source of LARCs in rural regions is worrisome, since most of the patent medicine dealers are untrained [31].

Most women held the opinion that LARCs were not easily accessible [49]. However, the proportion of women who thought that LARCs were not readily accessible decreased consistently with increase in educational status and residence in urban areas [49]. Hence, one can infer that with exposure to education, women become well informed on the various means of accessing LARCs and are financially capable of purchasing them.

Although a good number of Nigerian women desire them [50], there are certain barriers to accessing the wide variety of LARCs available. First, is the reduced availability of LARCs in certain family planning clinics [48,50]. The RESPOND project, reported feedback by one of the service providers where she buttressed this challenge:

"..Sometimes we run out of stock but not too frequently; when that happens, I will go into the market to get some so that we will have the methods, because we are mindful of our clients' appointment dates.... I used to tell the community that the IUD is now costly because we used to get it from black market in Makurdi..." [50]

—Service provider, Adikpo, Benue State, Nigeria

The lack of basic supplies and equipment most often lead providers to charge unauthorized fees that some women cannot afford or request clients to purchase LARC supplies from the black market notorious for its uncertain quality [50]. Second, some family planning clinics are in a poor state of repair, and many had either no or only intermittent electricity all of which discourages women [50].

The third barrier to accessing LARCs is the shortage of skilled providers to deliver LARC services [21]. For instance, although the policy that permits Community Health Extension Workers (CHEWs) to deliver Injectables was approved in 2012, only few CHEWs have received formal training on how to deliver the method properly [21]. Regarding other LARCs, Implants were introduced on a larger scale in the public sector only in 2006, and it is plausible that many providers who received training are no longer practicing in the public system [21]. Many experienced Family Planning (FP) providers cited the lack of continuing education and training as the reason for the rather reduced skill set in administering LARCs, pointing to the 1980s as the last time that large-scale FP training efforts were in place [21].

3.2 UTILIZATION/GEOPOLITICAL PREVALENCE

The contraceptive prevalence (CPR) of LARCs remain low relative to other short-acting contraceptives. Nevertheless, the CPR of LARCs increased steadily from 2.7 percent in 2003 to 7.4

percent in 2018 among married women using contraceptives [2,16] . Nationally, about 14.8 percent of women currently using any method of contraception used LARCs [51]. The prevalence LARCs was highest among women aged 35 years and above and lowest among those aged 15-24 [2,14–16,28]. Injectables and IUDs were the most frequently used LARC [2,14–16,26,28,42,45,52–54].

Use of LARCs varied with residence, region, level of education, number of living children, and economic status of the household [2,14–16]. Married women residing in urban areas were more likely to use LARCs than their rural counterparts [2,14–16,26]. The limited use of LARCs in rural areas persists for various reasons ranging from unavailability of the LARC methods to lack of proficiency in administering LARCs by rural care providers [26]. The South-West zone had the highest proportion of women using LARCs, followed by the South-South zone [2,14–16,49]. The lowest proportion of married women using any LARC method were in the North-East [2,14–16,49]. LARC use increased with educational attainment across all geopolitical zones [2,14–16,40,55]. By wealth quintile, women in the lowest quintile were least likely to use long-acting reversible contraception and women in the highest quintile were most likely to use them [2,14–16].

Use of LARCs was relatively low among singles compared to married women [48,56,57]. This may be because single women are less likely to source for contraception openly because of cultural and religious prohibition of premarital sex in Nigeria [56].

The uptake of LARCs increased with parity; women do not begin to use LARCs until they have had at least one child [2,14–16,41,45,56,58]. An attribute pointing to the reproductive need of women with less than 3 children and the popular consideration of LARC methods as an alternative to the sterilization method [41,56].

The most common reasons for using any method of long-acting reversible contraception were safety, reversibility, effectiveness, long-term protection, convenience, husband's approval, understanding of the LARC method, personal choice, the desire to have good maternal health, satisfaction with information given on insertion procedure and services rendered by the healthcare provider recommendation by another woman who had used the method, affordability, approval by religion and duration of the desired LARC [30,38,41,50,59].

Lack of knowledge, not being married, fear of the procedure, dislike of foreign body, inability to access LARCs, husband's objection, fear of side effects/complications, fear of infertility, need for further counselling, high cost of LARCs, preference for natural methods, lack of knowledge on provider centers, inadequate information on the benefits of LARCs, conflicts with their religious and cultural beliefs were the major reasons given by the women for not using LARCs [26,28,30,34,35,38,39,41,43,45,46,49,58–61]. Some women stated that they had no need for LARCs [34,49]. In their study, Eke & Alabi-Isama [34] reported that most adolescent females thought that LARCs should not be used by unmarried women.

Most women thought that negotiating and deciding with their husbands prior the use of any LARC method was necessary [49,50]. But in reality, men alone played the dominant role in women's decision to adopt long-acting reversible contraception and in the choice of method [43,49,50]. The dominant role of men affected the use of LARCs because men generally demonstrated less

favorable attitudes toward family planning than women and were less knowledgeable about LARCs [50]. Hence, a woman's ability to control her fertility and her choice of long-acting reversible contraception were partly determined by her empowerment status and self-image [2,14–16]. A woman who is unable to control her life may be less likely to feel she can make and carry out decisions about her fertility [2,14–16].

Depo Provera® and Noristerat® were the most commonly used brands of Injectables [14,15]. Depo Provera® was largely used by women in the South-East and North-West zones, while Noristerat® was primarily used by women in the North-East [14,15]. Notably, Depo Provera was the brand of choice for women in the lowest, second and fourth wealth quintile, who had either secondary, primary or no education [14,15]. Conversely, the use of Noristerat® increased with educational attainment and wealth status [14,15].

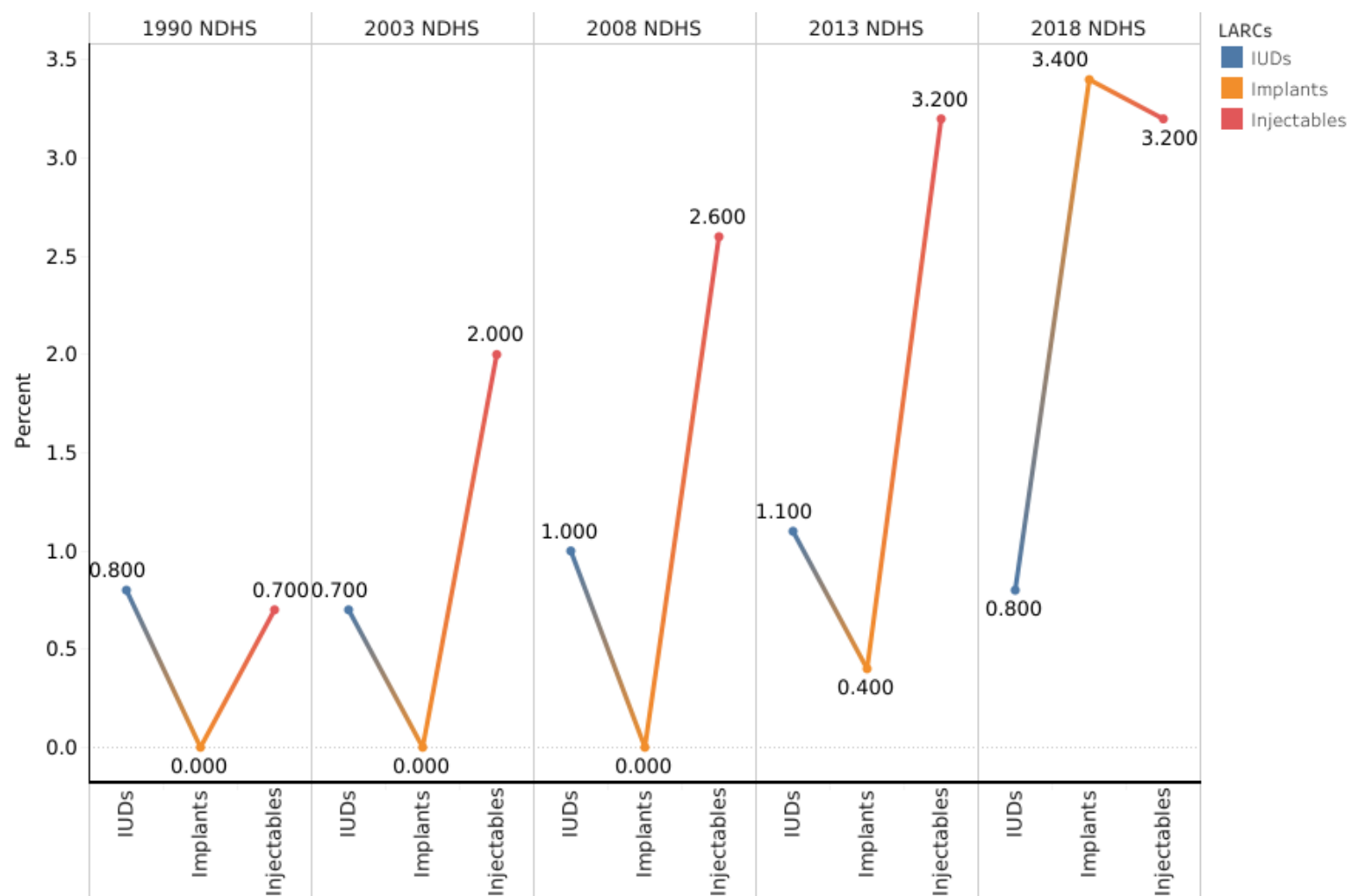
Overtime, the use of Implants, particularly Implanon® and Jadelle® became popular [2,14–16,62]. It even seems that Implants have slowly replaced IUDs which were commonly used earlier [2,14–16,62]. Highly educated women preferred Implants and had higher odds of using them the less educated counterparts. The plausible motive for this preference maybe the increased capacity to manage information correctly by educated women and awareness of the associated advantages of using Implants education provides [59]. Non-literate women appeared to be suspicious of new methods and therefore shunned the method [63]. Specifically, young Nigerian women with desire for future fertility formed significant proportion of Implanon® acceptors [64].

Figure 5: Percent distribution of LARC use by state (2018)



Source: NDHS 2018.

Figure 6: Trend of LARC use 1990-2013



Source: NDHS 1990, 2003, 2008, 2013 & 2018

IUDs are quite common and widely used in Nigeria, particularly by older married women aged 35 and above [2,14–16,48] but are gradually losing their appeal. They were least commonly used in Northern Nigeria. Religious constraints seem to be the major propeller behind this; Muslim women while not considering family planning as un-Islamic, often view the insertion of an external object into their body to be sacrilegious [35]. Although still used in other regions in Nigeria, IUDs are gradually losing favor in the South-Western region [2,14–16,24]. The need for their husband's consent maybe one of the primary reasons for the general decline in the application of IUDs. The thread from the IUDs often give women away when using them without their husband's consent [65]. The most common reason for discontinuation was a desire for pregnancy, especially among those younger than 35 years [48]. Married women were more likely to use IUDs than singles, as most singles opt for other forms of contraception [66].

Nigerian women are most often not aware or have misconceptions on the benefits and side effects of long-acting reversible contraception [21]. Hence, the need to heighten awareness, to enable women make informed decisions while choosing a LARC method. Women who used injectables and IUDs were more informed on the side effects of these methods, what to do if they experienced side effects and other methods of long-acting contraception available to them than women who opted for Implants [2,14–16]. LARC users were least likely to receive information about side effects or safety issues from a private medical facility than from a government hospital [2,14–16]. The same was true of information on what to do if they experienced side effects. [2,14–16]

Although some women were not current users, they indicated interest in using Injectables and IUDs in the future [14,50]. The proportion of Nigerian women who were non-users, but intend to use a modern method of contraception (such as LARCs) in the future was lowest in the North-East. This was the same for uneducated women living in rural areas [49]. Knowledge of this is crucial in order to meet the rising demand for LARCs by Nigerian women. These statistics confirm that demand generation will be a critical component of meeting the national contraceptive prevalence goal [21].

3.4 PROFILE OF WOMEN USING LARCS

LARCs were predominantly used by highly educated women aged 25 and above, residing in urban regions and married. Concerning the household wealth-index, women from poor households (lowest and second wealth quintiles) subscribed less to the different LARC methods compared to women from middle and wealthy households (middle, fourth and highest wealth quintiles) [2,14–16,28,45,51,56]. Women aged 25 years and above were more likely to use a LARC method compared to women aged 15–24 years [2,14–16,28,45,51,56]. Additionally, women who had 1–4 children subscribed further to LARC methods as opposed to women with no children [51]. [2,14–16,28,51].

3.5 EFFECTIVENESS

Generally, LARCs were found to be a highly effective method of birth control, with several studies reporting no accidental pregnancies (Pearl index= 0) [29,55,64,67–77]. While there were a few reports of unintended pregnancies, the failure rate was very minimal, ranging from 0.07 percent to 1.5 percent [65,78–84]. Although a relatively high failure rate of 3.7 percent was reported among

IUD users in Abia State [79], unexpected pregnancy was observed in just one out of the 27 IUD users. Larger studies, however, revealed that IUDs, particularly Copper T-380A, were effective in over 99 percent of users [69,70,72,74,78,84]. Similar high rates were found among users of progesterone-only injectables, notably Depot Medroxyprogesterone acetate (DMPA) [29,55,65,71,73,74,79,81] and Norethisterone enanthate (NET-EN), and contraceptive subdermal implants, such as Implanon® [64,68,75] Jadelle® [69] and Norplant® [67,77,82]. A study in Jos reported one failure (3.3 percent) among 30 women who requested for and had Implanon® rods removed [85]. However, this failure was due to inadvertent insertion of the implant during pregnancy.

3.6 SAFETY PROFILE AND COMPLICATIONS

While LARCs were generally reported to be safe, the chief complaints were menstrual abnormalities [53,55,64,65,67–71,78,79,81–84,86–88]. Secondary amenorrhea was the most prevalent menstrual disturbance among women using progesterone-only injectables [54,65,67,80,87,89] and reported to a lesser extent by users of IUDs [53,72,80] and subdermal implants [64,68,87]. One study in Enugu, however, reported amenorrhea as the main side effect experienced by Jadelle® users [69]. Other menstrual disturbances associated with the use of LARCs include irregular bleeding, heavy/prolonged bleeding, and dysmenorrhea. Also frequently reported complaints were lower abdominal pain [53,67,71–73,79–81] and vaginal discharge. Breast pain was also reported with the use of implants [67,68]. There were also considerable cases of weight gain [71,73,79,81] and a far lesser proportion of weight loss [79,81] among women using contraceptive injectables. Interestingly, there were a few reports of weight gain in users of IUDs and Implant, with one study in Jos reporting an average weight gain of 2.6kg among users of Copper T-380A [88]. Meanwhile, Sagay et al. suggested that Norplant tends to prolong PR and QRS electrocardiogram intervals [89]. Similarly, hypertension was associated with the use of injectables [29,81,83], though report. Expulsion and missing IUDs were also reported in a few studies [53,72,80,84].

3.7 BARRIERS TO USE OF LARCS

Shortage of skilled providers to deliver available LARC services is a major barrier to the uptake of LARCs. As stated earlier, only few approved CHEWs have actually received formal training on delivering injectables (i.e., providing the necessary counselling, screening for pregnancy, and delivering the actual injection) [29]. In the North, women rely on CHEWs with at least two years of post-secondary school education as the primary point of care [21]. In addition to their primary responsibility in delivering LARCs, these CHEWs often function as the sole staff members of Primary Health Care Centers, providing all the care in the community and sometimes delivering services for which they are not properly trained [21]. As at October 2018, 65 percent of Nigerian health facilities have a LARC-trained service provider [90]. But only 36 percent of these facilities provided LARCs to women at the same period. This shortage maybe because many providers who received training are no longer practicing in the public sector or that commodities, tool and job aids for delivering services are unavailable [21,91].

Some studies indicated that many service providers contributed to barriers to uptake by restricting access, based on their personal cultural/social norms or client's personal characteristics (i.e. age, parity, and marital status) [91–93]. A 2017 study which reviewed restrictions to contraceptive access imposed by service providers (nurses/midwives, patent and proprietary medicine vendors, CHEWs and pharmacists), showed that service preferences were given to clients who were married or older than 24yrs [94]. Similarly, the performance monitoring for action (PMA) 2020's Adolescents and Young Adults Health Brief indicated that unmarried individuals might be able to services for male condoms and emergency contraceptives – but are less likely to access same for LARCs [94]. As a result, unmarried individuals might choose not to use LARCs or opt for methods that are more likely accessible but less effective [94]. The unavailability of adequate youth-friendly Family Planning service points may be the biggest factor in preventing adolescents from accessing LARCs [91].

Another salient barrier to the uptake of LARCs which has most often been over-looked is the poor integration of family planning services (including LARCs) with maternal and new-born health, childhood immunization, nutrition programmes and prevention of mother-to-child transmission of HIV (PMTCT) services [91]. Although during pregnancy, women may not actively seek FP information or services, but they often engage proactively with the healthcare system during antenatal care, delivery, postnatal care, and first year infant immunizations [91]. These contact points offer valuable and reliable opportunities for healthcare providers to educate the women on LARC services. Some of the challenges of integration of FP with Maternal and Newborn & Child Health (MNCH) include resistance within the separate health programme responsible for FP and Maternal and Child Health services, facility or community-based workers who are not trained or have inadequate staff time to address both MNCH and FP needs [91].

Increased stock-outs of commodities due to unavailability or poor quality of actual consumption data to determine the true commodity need, delays in approving the supply plan to commence procurement, poorly implemented annual supply plans and irregular last mile distribution mostly due to lack of funding, limits the provision of quality LARC services [91].

Fear of side effects—real or perceived—is another key barrier hindering the use of LARCs. For example, some women fear that some methods cause excessive bleeding and infertility [45,50,61]. There were common beliefs that if a woman does not give birth to all the children in her womb, she may develop cancer [28,50]. Another commonly held opinion is that a couple should not use any family planning methods early in their childbearing years, to avoid infertility. Some men fear that women become promiscuous when they practice family planning [50].

Lack of support from the husband not only hinders initial contraceptive use but may also lead to pre- mature termination of use of a long-acting method [27,41,50,60]. To resolve this and achieve their birth-limiting goals, some women use contraceptive methods covertly, although such behavior may result in serious marital disharmony if the husband learns of it [50].

Other barriers to the use of LARCs include cultural bias (certain cultures are highly supportive of large family size), myths and misconceptions about LARCs, gender inequity, religious beliefs, fear of infection and reduction/loss of libido [27,28,30,41,46,50,61].

3.8 DISCONTINUATION

The discontinuation rate varied considerably across the different LARCs types and with the duration of usage. Unsurprisingly, there was an increase in discontinuation rates over time, particularly for injectables which typically require two-monthly or three-monthly administration. Moreover, the rate of discontinuation at 12 months of use was highest among women using DMPA injectables, ranging from 50 percent to 62 percent [74,79,81,95]. However, in Osogbo a slightly lower rate of 22.4 percent was observed [55]. Interestingly, an Enugu study documented a low discontinuation rate (12.8 percent) even at 36 months [55,65,71,83,86]. Compared to injectables, implants and IUDs had better continuity owing to their longer life span. The 12-month discontinuation rate for IUDs was 10%-22% [54,74,76,78,96], while those for implants were 1-8 percent for Implanon® [63,75] and 5.4-9.8% for Norplant® [67,74,87]. Jadelle®, a relatively new contraceptive implant in Nigeria, had no discontinuations among users in Rivers State [69]. Ogedengbe et al. [95], however, observed comparable discontinuation rates between IUDs (45.6%) and Injectables (50.2%). For Norplant®, after 36 months, approximately 11-18% of users had discontinued use [67,87,97].

3.8.1 Reasons for discontinuation

The most frequently reported reasons for discontinuing LARCs were the desire for pregnancy [54,67,68,78,80,82,85,87,89,95,96] and menstrual side effects [55,71,74–76,79,81,84–86,97]. Abnormal menstruation, particularly amenorrhea, was a commonly cited reason by users of contraceptive injectable [55,71,79,81,86]. Spousal factors such as husband's objection and husband's deaths were also linked with discontinuation [65]. Expulsion of contraceptive devices was also reported among IUD users [35,74,78,80,88,95].

3.9 POLICIES

The Federal Government of Nigeria (FGON) have made considerably good strides in creating an enabling environment for LARCs to thrive [49]. For instance, certain positive policy reforms have occurred, notably the Task Shifting and Sharing Policy which allows CHEWs to administer Injectables (they are still restricted from providing IUDs and implants) [21,91]. Additional reforms includes making LARCs free in public-sector clinics and reforming the nurse/midwife training curriculum to make it proficiency-based and supported by rigorous supervision [22,49]. These policy reforms yielded some success in the uptake of LARCs. For instance, between 2008 and 2013, the use of Implants increased from 0.4 to 3.4 percent [14,15]. Nigeria's Family Planning Effort (FPE) ratings in 2014 also indicate notable progress in Policies and Access [98]. Nevertheless, the country's FPE scores, are still very low compared to other countries in the region [98]. Hence, intensive efforts are needed to significantly improve Nigeria's FP policy and program environment [98].

Currently, there are at least four plans with Family Planning/Reproductive Health goals associated with them. These are the National LARC Strategy, the Reproductive Health Commodity Strategy, the National Strategic Health Development Plan, and the Maternal, Newborn, and Child Health (MNCH) Strategy [21]. Other important policies include the National Youth Policy (2009); Gender Policy (2008); National Policy on Health and Development of Adolescents and Young People in

Nigeria (2007) and the National School Health Policy (2006). The latter provides the framework for implementing the national school health program [99].

Additionally, the FGON committed to further creating an enabling environment for family planning activities (including LARCs). This commitment was buttressed in the following actions: revitalizing its commitment in the 2017 Summit on Family Planning, developing a national guideline to scale-up private providers' access to government's free FP commodities, reviewing the National Reproductive Health Policy and The Reproductive Health Strategic Framework and developing an accelerated introduction and scale-up plan for the Subcutaneous depot medroxyprogesterone acetate (DMPA-SC) to increase access to injectable contraceptives [91].

However, there are still some gaps in some of the policies, especially pertaining access to family planning services and rights to adolescents and youths [91]. Currently, reproductive health policies do not indicate unrestricted access to Family planning (including LARCs) services for youths, without provider discretion, parental or spousal consent [91]. Most policies and national documents are vague on the age of consent for youths (i.e. age of consent) [100]. These documents do not explicitly state the youth's legal right to freely and independently access a full range of contraceptive services, including LARCs [91]. Hence, health providers choosing to provide service to adolescents and youth are not protected by any policy statement that legally authorizes health providers to offer contraceptive services to this age group [91].

Furthermore, the Task Shifting and Sharing Policy does not adequately recognize the large resource pool of providers within the healthcare system that can offer some LARC services (e.g., injectables). These healthcare providers include; the Junior Community Health Extension Worker (JCHEWs), Community Pharmacists, Community Midwives and PPMVs. Inclusion of these providers in the Task Shifting and Sharing Policy is vital as these cadre could play important roles in providing LARCs to women since in a large proportion of rural facilities, they may be the only available healthcare providers [91].

Another policy challenge is the poor translation of existing policies to action [91]. There is a recurrent challenge of timely and effective implementation of most policies/guidelines [91]. This is especially so because the autonomy of adoption and implementation of policies made by the Federal Ministry of Health falls on the State Ministry of Health. For example, since the approval of the Task Shifting Policy in 2012, as at 2019, 13 states are yet to begin domestication [91]. Likewise, for the National FP Blueprint, 14 states are yet to domesticate the plan to state level costing implementation plans since its launch in 2014 [91].

Table 1: Summary of policy challenges

S/N	Policy Challenges
1.	Inadequate policies supporting Adolescent and Youth Family Planning
2.	Ambiguities in existing Family Planning policies (especially around adolescent and youth
3.	Poor translation of existing policies to action

Source: Nigeria Family Planning Blue Print (2020-2024), 2020.

4.0 PROGRAMS AND INITIATIVES

Several programs and initiatives have been launched to support the government's efforts to increase uptake of LARCs and ultimately achieve the national family planning goals of a modern contraceptive prevalence of 27 percent [91]. These programs have strikingly increased the provision of LARCs in Nigeria [22]. The most recent includes:

- The Marie Stopes Nigeria "BlueStar" social franchising program (2012): This supports more than 300 private-sector providers, particularly in the South, of whom about 70% are midwives. The midwives in turn provided a notably large number of women—more than 65,000—with contraception, especially implants, in 2015.
- The Society for Family Health's "Healthy Family Network social franchising program, with more than 300 service providers, has likewise been successful, although more with the IUDs.
- DKT International also launched a program that gives support to private providers, particularly in the South. Its model consists primarily of marketing contraceptive products to providers and distributors, without the networking and other components of social franchising. LARC sales in 2015 was at more than 100,000 which is striking.
- Marie Stopes Nigeria commenced a program focused on deploying "mobile outreach" teams in the North. These mobile outreaches typically occur in collaboration with the public sector and in public-sector sites. Remarkably, with only 8 outreach teams, they provided about 63,000 clients with LARCs in 2015, primarily implants
- Marie Stopes Nigeria also began the Family Health Plus initiative in 2014. It works with public-sector providers at the state level, now expanded to 20 states, emphasizing training, supportive supervision, and supply chain. Again, providing LARCs to more than 250,000 clients in 2015.

More than 550,000 women have received LARCs from just these 5 initiatives, representing over 2% of married women of reproductive age and 1.5% of all women of reproductive age in Nigeria [22].

LARCs engender high rates of satisfaction and continuation, the sustained cumulative effect of these programs over a period of time would be substantial. For instance, between 2014 and 2015, the share of overall modern contraceptive use for implants in Kaduna state (where Family Health Plus, Healthy Family Network, Marie Stopes Nigeria mobile outreach, and Nigerian Urban Reproductive Health Initiative as well as others) are all active, increased from 16 percent to 28 percent [101].

Furthermore, these programs have provided proof for many vague concepts about LARC uptake in Nigeria. First, it can now be firmly stated that LARCs are highly acceptable for Nigerian women desiring contraception [22]. Second, promoting equity by providing LARC services in very low-income as well as higher-income clients is highly efficient [22]. A precedent, indicates that 75 percent, 53 percent, and 49 percent of Marie Stopes Nigeria's mobile outreach, Family Health Plus, and social franchising clients, respectively, were from households living on less than US\$2.50 per day [22]. Third, success is attainable in every geographical zone in Nigeria. While it is generally held that the more conservative North is highly resistant to family planning, these projects—notably, mobile outreach and the Family Health Plus public-sector support project demonstrate that with

concerted efforts, success can be achieved in the North as well [22]. Fourth, the Family Health Plus program showed that despite the public sector's reputation as a weak service delivery platform, when the private sector works closely with the government, public-sector service delivery on LARCs can be successful [22].

Table 2: Provision of Long-Acting Reversible Contraceptive Methods by Selected Program Initiatives, Nigeria, 2015

Programs	Implants	IUDs	Total LARCs
Blue Star (Marie Stopes Nigeria)	51,643	13,811	65,454
Healthy Family Network (SFH)	20,273	53,900	74,173
DKT International Sales	15,967	87,600	103,567
Mobile Outreaches (Marie Stopes Nigeria)	53,786	9,200	62,986
Family Health Plus (Marie Stopes Nigeria)	222,705	29,686	252,391
Total	364,374	194,197	558,571

Source: For Marie Stopes Nigeria - personal communication with Anna Mackay; Deputy Director of SIFPO Project for Marie Stopes International; for SFH - personal communication with Peter Entonu, (Associate Director of Social Franchise Unit); for DKT, sales report from December 2015.

In addition to the programs described above, a number of other worthwhile initiatives are ongoing in Nigeria, including traditional social marketing and clinic-based public-sector and NGO service [22].

5.0 Discussion

Our review of 130 studies highlighted important issues bordering the practice of long-acting reversible contraception by Nigerian women. The reviewed studies provided evidence that the prevalence of LARCs in Nigeria have increased steadily over time. This progress maybe as a result of heightened knowledge and awareness on LARCs through intensified efforts on health education and media exposure [58,61,62]. However, as noted earlier, knowledge and awareness does not translate to use of LARCs - probably because general awareness about LARCs might be laced with mis-information and misconceptions which may reduce uptake [39,102,103].

Most of the studies reviewed reported the impact of education, income level and place of residence on the knowledge, awareness and subsequent use of LARCs by Nigerian women. Educated women who are high-income earners residing in urban regions are more likely to be aware and use LARCs than their counterparts. This maybe because first, well-educated women are able to manage information on LARCs more accurately and are aware of the benefits of using them [59]. Second, being financially independent gives women more autonomy over their body and empowers them to make better choices suitable for their well-being. Women with low income residing in rural areas have a rather high desire for a large family size since they often use children as a source of support in old age, help in the farms, shops and markets [45]. The fact that investments in women's education and autonomous employment can yield an increase in LARC uptake, is suggestive for the need of policies to act beyond the health sector alone.

From our review, the influence of friends, the media, family members and health workers on the choice of contraceptive method was very considerable. Women whose friends advised them to take LARCs made up their minds to choose the same methods as their friends [58]. Since their immediate community affects women's knowledge and use of LARCs, programs and initiatives on boosting the use of LARCs should focus on community integration. Studies have shown that involving village leaders, women's clubs, traditional midwives or local retailers can increase the use of family planning services [104,105].

Asides the fear of side effects, ignorance, cultural and religious bias were the major obstacles to using LARCs. Most women believe that the use of contraception (including LARCs) by unmarried women is associated with promiscuity [56,58]. This may explain the small number of single women using LARCs in Nigeria [56,58]. Family planning is most often not well-encouraged by Muslims for pronatalist reasons, they may accept family planning and support it, if only for health indications [59].

Several demographic factors were associated with the use of LARCs. Similar to our findings in this review, LARC uptake also increased with age in India [56,106], because in later ages most women would have probably achieved their desired family size and opt for long-acting contraception. This pattern reflects that Nigerian women often use LARCs to limit and not to space birth [106].

Interestingly, most Nigerian women did not use modern contraceptives like LARCs primarily because of their concern about certain side effects. In contrast, Pakistani women, did not use

modern contraceptives majorly due to fear of a negative perception by their in-laws, contrasting religious beliefs and lack of access to quality services in their areas [14]. On the other hand, women from more developed Western countries focus on the efficacy of any given method, nondaily usage or reversibility, and may not necessarily mind certain side effects, like changes in their menstrual pattern [107,108].

Even though there are positive gains in the increasing proportion of LARC use, there is still a significant number of women who are not covered in this progress. The FGON pledged at the London Summit on Family Planning to increase domestic funding for family planning [21]. This commitment if fully implanted will definitely yield positive returns in the use of LARCs.

The reduced discontinuation rate is reasonable, as women would rather not have to return after two/three months. However, to further reduce discontinuation rates, use of novel progestin-based contraceptives with nominal side effects which are known to be effective, and long-lasting should be encouraged. In cases where women opt for LARCs with shorter durations (i.e. LARCs), a strong communication network should be set in place to provide reminders for them. For instance, a study in Uganda showed that two thirds of the respondents felt that receiving messages on mobile phones helped them with contraceptive adherence or continuation decisions; in managing side effects; and in using the method more effectively [109]. This is because most contraceptive discontinuation is due to inconsistent use of the method. Consistent use of contraception is associated with previous knowledge [109].

Policy reforms such as allowing CHEWs to administer LARCs should be fully implemented especially in Northern Nigeria as they are the primary health care providers. The tremendous success from previous programs and initiatives are all pointers that LARCs can be successful in Nigeria, even in the most resistant areas with concerted efforts and strategic actions.

6.0 Recommendation and Conclusion

Our review indicated that irrespective of the various barriers to the uptake of LARCs by Nigerian women, progress has made. Nevertheless, more work needs to be done. Nigeria is a diverse and complex country and ultimate success in LARC uptake will require extensive resources, long-term attention, and a variability of approaches.

Filling the knowledge gaps about LARCs will require ongoing investments in awareness campaigns of various forms, such as mass media dissemination [110] or peer educational approaches [111]. This is a crucial step to uptake and continued use of LARCs. Since most women source their information primarily from friends and family, a community integrated approach should be employed as this may be more productive. Women should be given a wide range of information ranging from the various LARC services available to them, the side effects to what to do when they experience these side effects.

As noted in our review, religious belief systems tend to play a central role in the practice of long-acting reversible contraception. Hence, liaising with religious groups to support the promotion of LARCs might also prove highly effective. Furthermore, given the dominant roles husbands and other family members, such as mothers in law, seem to play in a woman's decision to use LARCs,

additional programmatic approaches need to be considered that involve and educate men more explicitly on LARCs and strengthen couples' and especially women's ability to decide about their individual reproductive needs [110].

Given the cultural role and social satisfaction that childbearing plays in our society, reproductive health programs need to be strategically tailored to address the specific cultural or traditional concerns that prevent Nigerian women from taking up LARCs. Health care providers should be trained to reduce cultural barriers and adequately address women's concerns on LARCs irrespective of age, social class, marital status and income level [112,113]. The first step towards providing these culturally sensitive services includes conveniently located, client-friendly, respectful, and confidential services [114], especially because some women take contraceptives without their husband's consent.

Furthermore, Integrating LARC services within the delivery of other maternal and child care services should be encouraged. Educating these women on LARCs during such period will prepare them for future use since they are more likely to become pregnant. Efforts aimed at improving the quality of LARC services should be directed not only towards attracting new clients, but also towards preventing LARC discontinuity [115]. It is important that LARC providers are sufficiently trained on the different LARC methods, their side effects, and their application to female clients. The assessment of FP service quality should include six elements: choice of method, information given to client, provider competence, provider relation with client, follow up mechanism, and appropriate constellation of services to make contraceptive use comfortable for couple [116].

Although a diversity of service delivery approaches and wide method choice should be supported, emphasis should be made in providing services through the private sector in the South and the public sector in the North. The private sector in South because of where of the wide distribution of private-sector providers and the entrepreneurial climate which is a sharp contrast to the North, where that private-sector infrastructure is currently thin. Hence, priority should be providing LARCs through the public and NGO sectors in Northern Nigeria. It also profitable to be opportunistic by working most with states that are willing to commit more of their own resources [22].

Expanded provision of LARCs and injectables by CHEWs, should be encouraged. Having CHEWs provide LARCs has been shown to be effective in research studies [117] and now presents a major opportunity for mainstream service delivery expansion, given the recent policy to permit it. To maximize this, CHEWs should be adequately trained first and supervised thoroughly in order to equip them in service provision. These well-trained CHEWs will go ahead to become mentors to new CHEWs that will join the health-system [22]. Provision of injectables by CHEWs should be a complementary priority, especially in the North where CHEWs are often the main or only clinical providers [118]. An additional opportunity yet to be harnessed is enabling provision of injectables through the many qualified proprietary patent medicine vendors (PPMVs) in both the North and the South. Currently, PPMVs are not permitted to provide injectables [22]. However, a recent PPMV census showed that over half in Northern states and about 30 percent in Southern states were trained by professionals including nurses, pharmacists, and CHEWs [119]. Since CHEWs are now

permitted to provide injectables (and implants) in the public sector, it will be highly beneficial that PPMVs trained as CHEWs or nurses should be permitted to administer injectables.

With respect to supply LARCs have the distinct advantage over shorter-acting methods in that they do not require frequent resupply [22]. However, they do require a modest amount of equipment and trained human resources. Hence, all staffers must be employed to ensure continued supply and distribution.

Policy and advocacy. Advocacy is needed at both the federal level and the state level toward meaningful funding for family planning. Again, key policy reforms, such as permitting trained pharmacists and PPMVs to provide injectables would make a considerable difference[22] in LARC uptake.

In order to implement all these, all hands must be on deck. LARCs have proven quite beneficial and safe. Hence, every effort must be set in place to ensure that every Nigerian woman is aware of LARCs, can readily access and use them at her disposition and free-will – a foremost reproductive right.

7.0 Appendix 1: Search Strategy

7.1 PUBMED

Date of search: 19th February 2021

Search hits: **392**

Search Number	Search Terms	Results
1.	"long acting reversible contracept*"	1,489
2.	iud or iuds	16,389
3.	iuc OR iucs	749
4.	"intrauterine device*"[tiab]	5,835
5.	"contraceptive implant*"[tiab]	1,362
6.	medroxyprogesterone[tiab]	6,700
7.	levonorgestrel[tiab]	5,137
8.	"intrauterine contracept*"[tiab]	2,537
9.	depo-provera	9,467
10.	Mirena	6,394
11.	larc or larcs	2,332
12.	nexplanon or implanon	965
13.	noristerat or norethindrone or norethisterone	5,423
14.	desogestrel[tiab]	1,157
15.	"contraceptive inject*"[tiab]	141
16.	(((((("long acting reversible contracept*") OR (iud or iuds)) OR (iuc OR iucs)) OR ("intrauterine device*"[tiab])) OR ("contraceptive implant*"[tiab])) OR (medroxyprogesterone[tiab])) OR (levonorgestrel[tiab])) OR ("intrauterine contracept*"[tiab])) OR (depo-provera)) OR (mirena)) OR (larc or larcs)) OR (nexplanon or implanon)) OR (noristerat or norethindrone or norethisterone)) OR (desogestrel[tiab])) OR ("contraceptive inject*"[tiab]))	38,233
17.	nigeria OR abia OR adamawa OR "akwa ibom" OR anambra OR bauchi OR bayelsa OR benue OR borno OR "cross river" OR delta OR ebonyi	394,915

	OR edo OR ekiti OR enugu OR gombe OR imo OR jigawa OR kaduna OR kano OR katsina OR kebbi OR kogei OR kwara OR lagos OR nasarawa OR niger OR ogun OR ondo OR osun OR oyo OR plateau OR rivers OR sokoto OR taraba OR yobe OR zamfara OR abuja OR fct or "federal capital territory"	
18.	((((((((("long acting reversible contraceptive") OR (iud or iuds)) OR (iuc OR iucs)) OR ("intrauterine device"[tiab])) OR ("contraceptive implant"[tiab])) OR (medroxyprogesterone[tiab])) OR (levonorgestrel[tiab])) OR ("intrauterine contraceptive"[tiab])) OR (depo-provera)) OR (mirena)) OR (larc or larcs)) OR (nexplanon or implanon)) OR (noristerat or norethindrone or norethisterone)) OR (desogestrel[tiab])) OR ("contraceptive inject"[tiab])) AND (nigeria OR abia OR adamawa OR "akwa ibom" OR anambra OR bauchi OR bayelsa OR benue OR borno OR "cross river" OR delta OR ebonyi OR edo OR ekiti OR enugu OR gombe OR imo OR jigawa OR kaduna OR kano OR katsina OR kebbi OR kogei OR kwara OR lagos OR nasarawa OR niger OR ogun OR ondo OR osun OR oyo OR plateau OR rivers OR sokoto OR taraba OR yobe OR zamfara OR abuja OR fct or "federal capital territory")	593

APPENDIX 7.1 (CONTINUED)

Search Number	Search Terms	Results
19.	((((((((((((("long acting reversible contracept*") OR (iud or iuds)) OR (iuc OR iucs)) OR ("intrauterine device*" [tiab])) OR ("contraceptive implant*" [tiab])) OR (medroxyprogesterone [tiab])) OR (levonorgestrel [tiab])) OR ("intrauterine contracept*" [tiab])) OR (depo-provera)) OR (mirena)) OR (larc or larcs)) OR (nexplanon or implanon)) OR (noristerat or norethindrone or norethisterone)) OR (desogestrel [tiab])) OR ("contraceptive inject*" [tiab])) AND (nigeria OR abia OR adamawa OR "akwa ibom" OR anambra OR bauchi OR bayelsa OR benue OR borno OR "cross river" OR delta OR ebonyi OR edo OR ekiti OR enugu OR gombe OR imo OR jigawa OR kaduna OR kano OR katsina OR kebbi OR kogi OR kwara OR lagos OR nasarawa OR niger OR ogun OR ondo OR osun OR oyo OR plateau OR rivers OR sokoto OR taraba OR yobe OR zamfara OR abuja OR fct or "federal capital territory") Filter: English	579
20.	((((((((((((("long acting reversible contracept*") OR (iud or iuds)) OR (iuc OR iucs)) OR ("intrauterine device*" [tiab])) OR ("contraceptive implant*" [tiab])) OR (medroxyprogesterone [tiab])) OR (levonorgestrel [tiab])) OR ("intrauterine contracept*" [tiab])) OR (depo-provera)) OR (mirena)) OR (larc or larcs)) OR (nexplanon or implanon)) OR (noristerat or norethindrone or norethisterone)) OR (desogestrel [tiab])) OR ("contraceptive inject*" [tiab])) AND (nigeria OR abia OR adamawa OR "akwa ibom" OR anambra OR bauchi OR bayelsa OR benue OR borno OR "cross river" OR delta OR ebonyi OR edo OR ekiti OR enugu OR gombe OR imo OR jigawa OR kaduna OR kano OR katsina OR kebbi OR kogi OR kwara OR lagos OR nasarawa OR niger OR ogun OR ondo OR osun OR oyo OR plateau OR rivers OR sokoto OR taraba OR yobe OR zamfara OR abuja OR fct or "federal capital territory") Filter: English, Humans	392

7.3 EMBASE

Date of search: 18th February 2021

Search hits: **466**

Search Number	Search Terms	Results
1.	'long acting reversible contracepti**'	2,434
2.	larc*	10,852
3.	'contraceptive implant*':ab,ti	1,117
4.	'contraceptive inject*':ti,ab	155
5.	'intrauterine device*':ab,ti	7,597
6.	levono\$gestrel:ab,ti	6,279
7.	desogestrel:ab,ti	1,313
8.	Mirena	1,994
9.	iud*	12,389
10.	'intrauterine system*':ab,ti	1,853
11.	medroxyprogesterone:ab,ti	7,670
12.	norethisterone:ab,ti	2,322
13.	'depo provera'	2124
14.	norethindrone:ab,ti	1,394
15.	Noristerat	87
16.	'sayana press'	36
17.	nexplanon OR implanon	1,232
18.	'intrauterine contracept*':ab,ti	3,208
19.	'long acting reversible birth control*'	1
20.	iuc*	7,748
21.	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20	53,892

22.	nigeria OR abia OR adamawa OR 'akwa ibom' OR anambra OR bauchi OR bayelsa OR benue OR borno OR 'cross river' OR delta OR ebonyi OR edo OR ekiti OR enugu OR gombe OR imo OR jigawa OR kaduna OR kano OR katsina OR kebbi OR kogi OR kwara OR lagos OR nasarawa OR niger OR ogun OR ondo OR osun OR oyo OR plateau OR rivers OR sokoto OR taraba OR yobe OR zamfara OR abuja OR fct OR 'federal capital territory'	348,835
23.	#21 AND #22	704
24.	#21 AND #22 AND [english]/lim	673
25.	#21 AND #22 AND [english]/lim AND [humans]/lim	466

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