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Exploring the Knowledge, Attitude and Practice Regarding Mosquito Borne Diseases among Migrants in Thrissur District and the Need for Implementing One Health Approach in the Control of Vector Borne Diseases; A Mixed Method Study

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Abstract: Background: In Nigeria, unmet need for family planning remains a major barrier to reproductive rights and maternal health, particularly in high-population states such as Kaduna and Kano. Frequent stock-outs of modern contraceptives at the last mile have historically limited clients' ability to access their preferred methods, contributing to dissatisfaction, discontinuation, and unmet fertility intentions. Methods: This article analyzes the impact of the Strengthening Integrated Last Mile Delivery and Supply Visibility (SILMD & SV) Pilot Project, implemented between April 2025 and February 2026 in Kaduna and Kano States in northern Nigeria. Using a mixed-methods approach, quantitative service delivery and commodity availability data were compared across pre- and post-rollout periods, and qualitative insights were obtained through interviews with service providers across 32 rural, semi-urban, and urban health facilities. Results: Family planning commodity availability increased substantially, rising from 24% to 70% in Kaduna State and from 18% to 78% in Kano State following project-supported last-mile distribution. This improvement coincided with marked increases in service uptake across nearly all contraceptive methods. New female acceptors increased by 56% in Kaduna State and 61% in Kano State, while male acceptors rose by 47% and 247%, respectively. Uptake of injectables and implants showed the most pronounced growth, reflecting client preferences for longer-acting methods. Qualitative findings attributed increased turnout to reliable availability, reduced client disappointment, and improved trust in health facilities, while also highlighting persistent challenges related to myths, misconceptions, and self-injection confidence. Conclusion: Strengthening last-mile supply chains is a critical enabler of contraceptive choice and service uptake. However, sustained gains require complementary demand-side interventions, provider engagement, and community sensitization to address misconceptions. The SILMD & SV Pilot Project demonstrates a scalable model for improving family planning access and advancing reproductive agency in Nigeria and similar settings.

Keywords: Family planning, Last-mile supply chain, Contraceptive availability, Mixed-methods, Northern Nigeria, Reproductive health access

INTRODUCTION

In Nigeria, the ability to practice child spacing as a fundamental reproductive right remains out of reach for many families. According to a UNFPA/YouGov survey, more than 1 in 10 Nigerian women and men have more children than they desire, often citing social pressures or limited access to reproductive health services, particularly family planning, as primary reasons[1]. Access to a variety of contraceptive methods is crucial for upholding this right and

offers significant health and socio-economic benefits[2]. It enables optimal child spacing of 2-3 years, reduces pregnancy-related health risks, and allows women to pursue education and employment[3]. Recognizing this need is particularly critical in regions with large populations of women of reproductive age, such as Kano and Kaduna States, which are among the three highest most populous states in Nigeria. According to the National Population Commission's 2022 projection[4], these states are home to over 4.7 million and 3 million women of reproductive age, respectively. Therefore, targeted interventions are essential to bridge the gap between fertility goals and reproductive reality by making different family planning commodities available at the right place and time.

THE INTERVENTION

To address the challenge of commodity availability, the Gates Foundation funded the Strengthening Integrated Last Mile Delivery and Supply Visibility (SILMD & SV) Pilot Project. This one-year pilot, implemented from April 2025 to February 2026 in Kaduna and Kano States, aimed to ensure a consistent supply of family planning commodities directly to health facilities. The project's core strategy was to guarantee that clients could access their method of choice at the right time and place.

The commodity distribution began with the initial cycle of last-mile deliveries to health facilities between April and May 2025 across both Kaduna and Kano States, followed by two additional distribution cycles throughout the year (July/August, and September/October 2025). A wide range of modern contraceptives was distributed across both states, including male and female condoms, various injectables (Depo-Provera, Noristerat, Sayana Press), oral pills (Exluton/Microlut/Ovrette/Microgynon), IUDs (Copper and Hormonal), Cycle Beads and implants (Implanon NXT, Jadelle, Levoplant). In total, over one million male condoms and hundreds of thousands of doses of injectables and implants were delivered, significantly boosting the stock available at the health facility and community level.

METHODOLOGY OF THE ANALYSIS

The analysis of the project's impact utilized both quantitative and qualitative data. Quantitative data was sourced from the national DHIS2 platform[5], comparing health facility service delivery data from two distinct periods: the seven months prior to the commodity roll-out (November 2024 to May 2025) and the seven months during the post-rollout period (June 2025 to December 2025). This pre and post-rollout comparison was used to measure changes in client turnout and service uptake.

Baseline commodity availability, sourced from national NHLMIS platform was measured using data from the January–February 2025 reporting period, while the average commodity availability during project-supported distribution was calculated as the mean of the remaining bi-monthly reporting periods of the year[6].

To augment and provide context to the numbers, qualitative data was gathered through interviews with family planning service providers. These interviews were conducted during monitoring visits to 32 health facilities across both states, representing rural (17), semi-urban (4), and urban (11) settings.

RESULTS: WHEN AVAILABILITY MEETS DEMAND

The project contributed to increased availability of family planning commodities in public health facilities in both states. In the January/February 2025 reporting period, prior to the first cycle of commodity deliveries to health facilities, family planning commodity availability at state level stood at just 24 percent in Kaduna Staate and 18 percent in Kano State. From April 2025 to December 2025, which corresponds to five subsequent NHLMIS reporting periods of the year, this surged to an average of 70 percent in Kaduna State and 78 percent in Kano State. This increase in stock contributed to increased client turnout and service uptake across all contraceptive methods in both states. The story behind the statistics, as told by family planning service providers, reveals how availability contributed to the transformation of the client experience.

ENDING DISAPPOINTMENT AND DRIVING DEMAND

Before the project, stock-outs were a common source of frustration. A family planning service provider at Kadawa Gate Primary Health Centre in Kano State described the scene: "*Before the commencement of the intervention, many key commodities, especially injections and implants, were not available even though clients preferred them. Often, women left the facility disappointed when told their choice wasn't in stock.*"

The quantitative data confirms that this scenario changed. With commodities available, clients who had previously left empty-handed could now receive services. An analysis of family planning acceptor data from both states reveals a strong positive impact following the roll-out period, marked by substantial growth across both sexes. In Kano State, total new female acceptors rose from 49,783 to 80,360, a 61 percent increase, demonstrating a significant expansion in service uptake among women. More notably, male acceptors experienced a dramatic surge from just 625 to 2,168, representing a 247 percent increase. Similarly, in Kaduna State, while total new female acceptors increased from 44,635 to 69,644, a 56 percent rise, reflecting a strong and consistent expansion in service uptake among women, male acceptors grew from 3,899 to 5,729, a 47 percent increase.

A provider from Yakasai Health Post in Kano State linked this increase in client turnout (including new acceptors) to commodity availability, stating that:

> *Client turnout has increased since the rollout, as more methods are now consistently available and in sufficient quantities. In some cases, husbands accompany their wives to access family planning services; this is a new trend compared to what was obtained in the past.*

GROWTH IN CONDOM DISTRIBUTION

Following the distribution of millions of condoms in the two states, there has been an increase in demand between the pre-rollout and post-rollout periods. In Kano State, the number of clients receiving male condoms increased from 786 to 5,865 (a 646 percent increase), while those receiving female condoms rose from 261 to 1,127 (an increase of 332 percent). The story was similar in Kaduna State, with male condom distribution increasing from 8,925 to 12,524 (a 40 percent increase), and female condoms increasing from 1,178 to 2,803 (an increase of 58 percent).

PREFERENCES MADE POSSIBLE: THE RISE OF INJECTABLES AND IMPLANTS

The data clearly shows a strong preference for long acting and longer-lasting methods. In Kano State, injectables saw massive gains, with Noristerat uptake increasing from 9,404 to 28,336, a 201 percent increase and *DMPA-IM,* otherwise known as Depo-Provera went up from 12,047 to 27,770, an increase of 131 percent. Kaduna State experienced a similar trend, with DMPA-IM more than doubling from 18,469 to 37,309, a 102 percent increase, and Noristerat rising by 31 percent, an increase from 18,242 to 23,936.

Service providers offered context for this popularity. A provider in Gwarzo General Hospital in Kano State noted that clients often refer to family planning simply as "*allura*" in Hausa Language (injection), indicating how deeply ingrained the method is because of its acceptance. In addition, the preference for Noristerat, according to a provider in Tarauni PHC in Kano State, is *"largely due to the perception that it has no side effects, unlike Depo Provera, which is reported to cause bleeding by some clients."*

For DMPA-SC (Sayana Press), a similar trend was observed. In Kaduna State, self-injection of DMPA-SC by women increased from 16,695 to 27,932, a 67 percent increase, while the provider administered DMPA-SC increased from 7,347 to 8,718, an increase of 19 percent. According to a service provider in Makera PHC in Kaduna State, "To most clients, Sayana Press serves as an alternative when Noristerat is out of stock." However, the data for Kano State tells a more nuanced story. While provider administered DMPA-SC remained stable in Kano from 17,922 to 18,058 (a one percent increase), the number of women opting for self-injection actually fell by 14 percent from 24,105 to 20,741, which may be attributed to low client confidence in self-injection as mentioned by a service providers across health facilities including the In Charge of the unit in Gwarzo General Hospital in Kano State who says *"clients prefer administration by service providers rather than self-administration"*. She continued, *"In some cases, clients who initially took the commodity home for self-administration later returned to the facility for provider administration due to lack of self-confidence"*, this calls for improved coaching technique from service providers.

Implants also saw an increase in uptake, with Implanon NXT insertions rising from 8,601 to 13,899, a 62 percent increase in Kano State, and from 12,679 to 18,617, an increase of 47 percent in Kaduna State. Jadelle insertions were up by 54 percent, from 5,220 to 8,054, and by 55 percent, from 7,518 to 11,676, in Kano and Kaduna State, respectively. A provider at Rigachukun PHC in Kaduna State confirmed their popularity, stating, *"Implants are preferred by clients due to their long duration."*

THE PERSISTENT CHALLENGE OF MYTHS AND MISCONCEPTIONS

IUDs remained the least preferred method, *although uptake still increased after the rollout compared with the pre-rollout period*. In Kano, comparing the two periods, the number of clients choosing the hormonal IUD rose from 1,237 to 1,426, a 15 percent increase. Copper IUD saw a much larger gain, increasing from 1,910 to 3,252, or 70 percent. In Kaduna, over the same two periods, the hormonal IUD rose from 304 to 506, a 66 percent increase, while the copper IUD increased from 955 to 1,599, a 68 percent rise. However, the qualitative data explains why it is the least preferred due to some resistance as a service provider in Tukur Tukur PHC in Zaria, Kaduna State, stated, *"IUDs remain least preferred due to clients'*

shyness due to the insertion method, and hygiene concerns." A provider in Makera PHC in Kaduna State added,

> *Infection due to poor hygiene in some women and the complaint of irritation affects acceptability of IUD. There are also myths linking it to cancer, a misinformation that caused many women to re-visit the health facility for its removal some months back.*

Similarly, while implants were popular, they faced their own barriers. A provider in Yakasai Health Post in Kano State noted the requirement of *"refraining from engaging in physically demanding activities for 4 to 5 days following insertion as a deterrent, alongside myths about implants "hiding" in the body or causing bleeding."* Despite the increased uptake of pills among clients in Kano State, rising from 4,855 to 10,637, a rise by 119 percent, and from 7,155 to 12,131, an increase by 70 percent, in Kaduna State, the method presents notable challenges that affect provider preference, as explained by a provider from Kundila PHC in Kano State who says, *"clients' difficulty in remembering to take them (pills) daily is affecting its acceptance."*

These challenges highlight the critical role of counselling. A provider in Lambu BHC in Kano State noted that, *"while some women visit the facility with a predetermined choice, others are convinced after receiving counselling from providers."* This underscores that availability is only one part of the equation. A service provider in Hayin Banki PHC in Kaduna State affirmed this, stating that, *"ongoing sensitization during health talks contributes to a gradual improvement in the acceptance of the methods."*

LESSONS LEARNED AND THE PATH FORWARD

The Strengthening Integrated Last Mile Delivery & Supply Visibility (SILMD & SV) Pilot Project *offers powerful lessons for family planning programming in Nigeria and beyond.*

First, supply matters. The dramatic increase in availability, from below 25 percent to over 70 percent, was the necessary foundation for everything that followed. Without commodities on the shelf, demand cannot be met, no matter how strong it is. Investments in last-mile supply chains are not merely logistical; they are investments in human rights and public health.

Second, supply alone is not enough. The persistent myths surrounding IUDs, the challenges with self-injection, and the need for ongoing counselling all point to the critical importance of demand-side interventions. Community sensitization, health talks, and one-on-one counselling are essential to dispel misconceptions and build confidence in less familiar methods.

Third, listen to providers. The insights from service providers were invaluable in explaining the data. They revealed why Noristerat is preferred, why self-injection numbers declined, and why IUDs remain underutilized. Any effort to improve family planning services must include the voices of those on the front lines.

Fourth, engage men. The increase in male acceptors, along with reports of husbands supporting their wives' choices, suggests that men are willing to be active partners in family planning. As a husband in a rural community in Kano State noted, *"I allowed my wife to access family planning services due to its health benefits, as well as the fact that if you do*

not plan your family, you may end up with too many children to care for, making it difficult to provide their basic needs." Therefore, programs should intentionally build on this momentum by designing interventions that actively engage men as allies in family planning.

CONCLUSION: A MODEL FOR TRANSFORMATION

The Strengthening Integrated Last Mile Delivery & Supply Visibility (SILMD & SV) Pilot Project in Kaduna and Kano States demonstrates that transforming family planning services is possible. *By strengthening the supply chain, the project enabled women and men to exercise real contraceptive choice*. By listening to providers, it gained insights that numbers alone could not provide. And by engaging communities, it began to shift deeply held norms.

The result is a model that can be replicated. From the disappointment of empty shelves to the empowerment of genuine choice, the journey of these two states offers a roadmap for others. When commodities are available, when counselling is effective, and when communities are engaged, family planning becomes not just a service, but a foundation for healthier, more prosperous lives.

As one provider in Lambu MPHC in Kano State summed it up: *"Due to the variety of methods since the rollout, clients are no longer asked to return on another date due to unavailability of their preferred choice."*

In that simple statement lies the project's greatest achievement: turning a system of frequent disappointment into one of reliable, respectful care. It is a transformation every woman deserves.

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