Understanding contraceptive uptake and usage in Sokoto state using a difference in difference approach

April 2024 - January 2025

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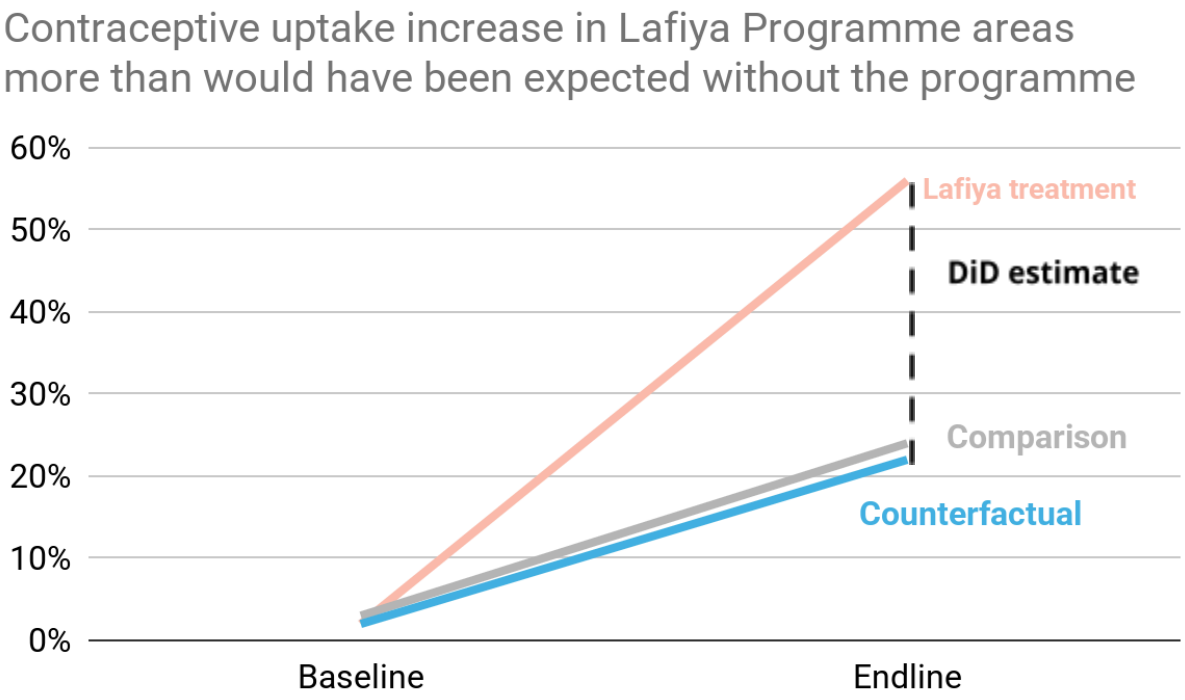
With thanks to Dr Bello, Habibat Salau, and Nasiru Fukai

Executive Summary

This study evaluates the Lafiya programme in Sokoto state between April 2024 and January 2025. Our primary objective was to estimate the counterfactual impact of the programme on contraceptive uptake in the treatment areas using a difference-in-differences design and a linear probability model, with data collected from 526 women at baseline and endline. In addition, we explored broader evaluation questions regarding demographics, method choice, self-injection, contraceptive rejection and discontinuation, and family planning advice, employing a combination of descriptive statistics and thematic analysis.



In Lafiya programme areas, contraceptive uptake increased from 2% to 56%, while in the comparison area it rose 3% to 24%, perhaps due to survey effects and government provision.

Using the comparison we modelled a counterfactual Lafiya scenario - an increase in contraceptive uptake from 2-22% . Thus the Lafiya programme resulted in **a statistically significant 34 percentage point counterfactual increase in contraceptive uptake.**

Other findings

Reach

- **Lafiya mostly reaches women in their reproductive prime**, aged 18-31, with 1-4 children. The majority of women have no or no formal schooling.
- Although Lafiya effectively reaches more poor and first-time users relative to the overall population, there is still **potential to increase outreach to these groups**.
- At the endline, most women reported obtaining contraception from a health facility, with the proportion being **10% higher in Lafiya areas** compared to the comparison areas. This suggests that **Lafiya's main channel was via health centre outreach.**

Methods and consistency

- At baseline, in Lafiya areas, pills and implants were most used. By endline, Sayana Press, injectables and implants were most used **- a shift to more effective and longer-lasting methods.**
- By endline, **87% of women in Lafiya areas reported using their contraceptive method consistently** (although consistency also increased in the comparison group). Only two Sayana Press users reported issues with consistency related to bleeding and missed periods.

Sayana Press and self-injection

- **77% of Sayana Press users self-injected,** which can enhance consistency if more home doses are received. However, self-injectors and non-self-injectors received a similar average number of doses, and 30% of self-injectors received only one dose. Recent policy changes now make it feasible to give more doses. Lafiya should ensure as many women as possible are being offered multiple doses.
- Reasons to not self-inject included preference for provider administration, lack of confidence in ability to self-inject, fear of injection, family member administration and fear of at-home discovery.

Pregnancy

- This study was not designed to analyse pregnancy outcomes, but we did notice intriguing results, with **only 6% of women becoming pregnant in Lafiya areas compared to 30% in comparison areas.** In future studies, pregnancy rates should be investigated to establish if a causal link exists.

Rejection and discontinuation

- The most common reasons for women never using contraception were not believing in contraception, desiring pregnancy, and side effects. Despite persistent stock-outs, few women in either group reported access or affordability as their main barrier. Social, personal and familial reasons dominated.
- There was an **18 percentage point increase in both areas of women reporting 'husband disapproves' as their main reason for forgoing contraception**. This may indicate potential backlash. Increased male engagement is important.
- For women who discontinued contraception, their main reasons were 'wanting to be pregnant' (53%) and 'side effects' (33%), emphasising the importance of counselling on side effects. **No user of Sayana Press reported method failure.**

Access and quality of contraceptive advice

- Access to contraceptive advice was initially high in both groups and remained steady or increased over the study. Increases in contraceptive satisfaction and actions taken after counselling increased in both groups but with stronger effects in the treatment group. Access to advice does not seem to be a large driver of Lafiya's impact, but quality advice is important for respectful care that is sensitive to personal, cultural and familial concerns.

Recommendations

Program

- Consider ways to reach more women from lower socioeconomic backgrounds and first time users.
- Continue to explain the benefits of birth spacing by linking this to social, cultural and personal barriers. Ensure women are properly counselled on side effects.
- Investigate the potential for male backlash and consider how to engage men better in contraceptive discussions.
- Review protocols and practices for taking home doses following self-injection.

Research

- Investigate and support improvements to government data collection practices.
- Undertake further longitudinal research to gather data on contraceptive use consistency and disposal of Sayana Press.
- Undertake research with endline-only groups to quantify potential survey effects.
- Conduct a future study to understand the causal linkages between increased contraceptive uptake and pregnancy outcomes.
- Review and refine future survey instruments, paying particular attention to consistent question wording and response options, and carefully explaining the term 'Lafiya Sister.'

Introduction

Samu Lafiya Initiative for Development (also known as Lafiya Nigeria) is a CAC-registered health organisation that aims to increase contraceptive uptake through the provision of contraceptive counselling and distribution of Sayana Press via a network of Lafiya-trained trained government-supported nurses called 'Lafiya Sisters'. As of January 2025, Lafiya Nigeria has successfully distributed over 106,000 doses of Sayana Press across four regions in northern Nigeria.

In early 2024, Lafiya began work in Sokoto state. This expansion provided a strategic opportunity to evaluate the organization's model, allowing for the collection of both baseline and endline measures of contraceptive uptake from a treatment and comparison group. This data can provide invaluable insights into the effectiveness of Lafiya's approach and its counterfactual impact, which can inform future scaling and programmatic decisions.

From April 2024 to January 6 2025, Lafiya trained 39 Lafiya Sisters (20 in treatment areas) on contraceptive counselling and Sayana Press use and gave them doses of Sayana Press for distribution at health facilities, homes and via community outreach events. During this period, Lafiya Sisters reported distributing 41,339 doses of Sayana Press in Sokoto state and 26,419 doses in the treatment area. A baseline evaluation took place before the first distributions in March 2024. The endline evaluation took place in January 2025 - eight months after initiation.

Aim

This evaluation answers the following evaluation questions:

1. Does Lafiya's program result in an increase in contraceptive uptake compared to similar comparison regions?
2. How did uptake vary amongst women of different ages, economic situations and family situations?
3. What contraceptive methods were women using, where did they get these methods, and how consistently were they using these methods?
4. For women who used Sayana Press, how many self-injected and why/why not?
5. Why did women reject family planning or stop using family planning?
6. Do women in a Lafiya Sister catchment have better access to family planning counselling than women in similar comparison areas?

7. Do women in Lafiya areas experience better quality counselling? Why do women not get family planning advice?

This evaluation was designed and overseen by an independent consultant with input from the Lafiya Nigeria senior management team and senior leadership from a local research firm. Data collection, validation and quality checks were completed by a local Nigerian firm.

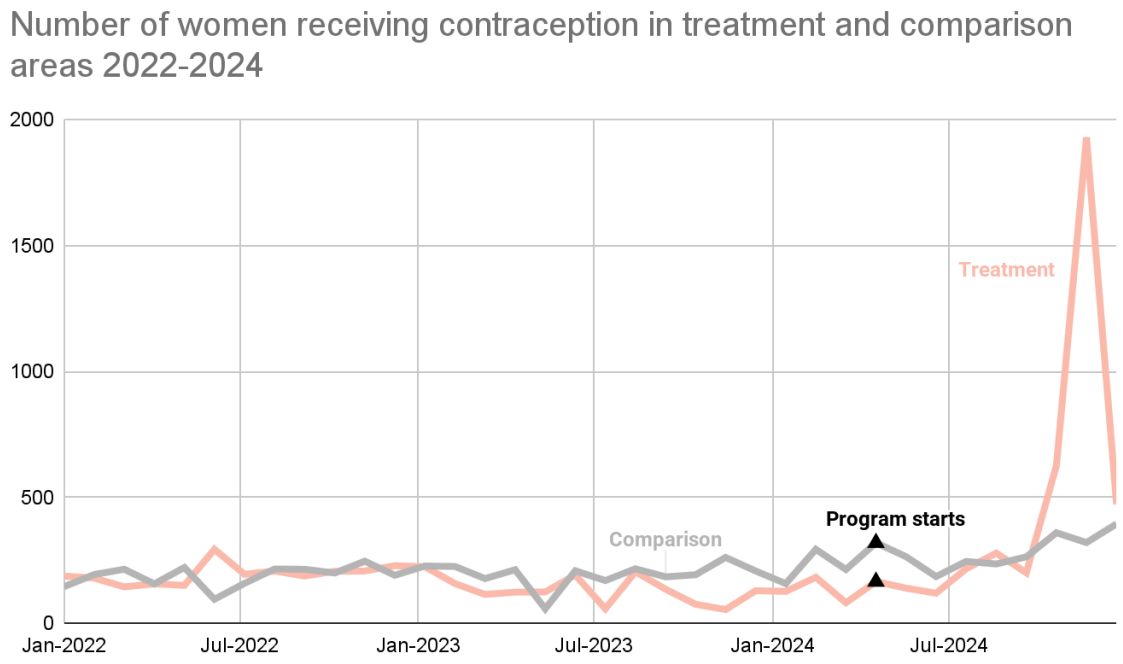
Design

A quasi-experimental design uses 'natural' experiments rather than randomisation to draw conclusions about causation. Given the practical challenges of randomisation for Lafiya, such as the logistical complexities of randomly assigning Lafiya Sisters to different areas, and considerations of safety, distance, and the willingness of government and health facilities to participate, this study used a quasi-experimental, difference in difference (DID) design. DiD uses pre and post longitudinal data to compare changes over time in treatment and comparison groups to obtain an appropriate counterfactual to estimate a causal effect. In this study, we took a baseline measure via a survey of uptake of counselling and contraception by women with an unmet need for contraception on selected and matched treatment and comparison areas. After eight months of implementation, we followed up with these same women via another survey. This enables us to understand not just the difference between the treatment and comparison group in contraceptive uptake after the intervention but also the difference between the treatment group and the unobserved counterfactual outcome that this treatment group would have experienced if it were not for the intervention, inferred from the comparison group.

The difference-in-difference method relies on four key assumptions:

- **Intervention allocation was not determined by outcome:** The two LGAs and the wards within these LGAs were selected based on their similar attributes (see Table 1 below). The treatment LGA was then randomly chosen from this subset.
- **Treatment/intervention and control groups have parallel trends in outcome:** Administration data from health facilities in 2023 and 2024 can help us review the parallel trends assumption. While this data is a bit noisy given variable reporting practices, these two areas generally had similar trends in contraceptive uptake before the program start date. The very large increase in November 2024 resulted from the manual checking of contraceptive provision by Lafiya staff at the health facility. This indicates there might be consistent undercounting of contraception

provision in administrative data. The state and facility-level M&E officers have been made aware of this issue and are updating data from October- December 2024 and improving their data collection practices.



- **The composition of the intervention and comparison groups is stable for repeated cross-sectional design.** Our final comparison and treatment groups were matched to ensure the same women were present at baseline and endline. Women who were absent at one or the other were excluded from the analysis.

- **No spillover effects**. Despite our best efforts, there was some spillover into the comparison group, with 18 respondents reporting they received Sayana Press from a Lafiya Sister. We removed these cases from the baseline and endline analysis and checked that this did not significantly impact the overall effect. However, there may be more spillover cases which we were unaware of. This has been noted in the limitations section.

Alongside a Difference-in-Difference estimate, we gathered data for descriptive and thematic analysis to answer questions relating to variations in contraception experiences, explore reasons for rejection or stoppage of contraceptive methods, and better understand self-injection practices.

Methodology

Treatment and Comparison Ward Selection

Treatment and comparison wards were selected and matched from LGAs in Sokoto state based on state-level government data on the following criteria:.

- Estimated population of women of reproductive age
- 2023 provision of family planning services, as a percentage of the reproductive population
- Number and level of health facilities present in the Ward
- Rural location
- Presence/absence of other family planning organisations
- Safety and Security
- Noncontiguous (to reduce the likelihood of spillover effects)
- Feasibility (e.g. close enough to travel between for implementation and evaluation purposes)

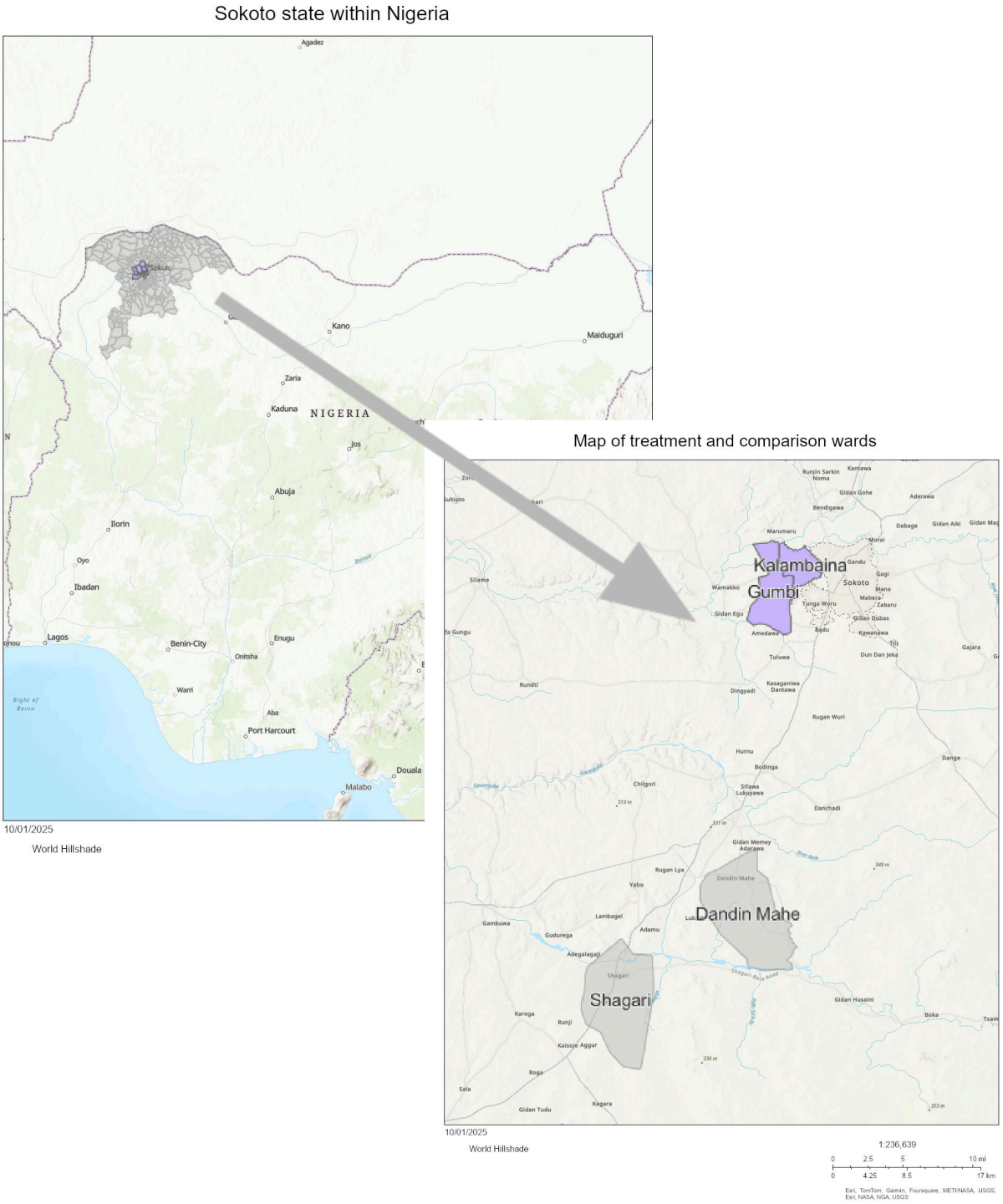
The final two treatment and two comparison wards were chosen in the LGAs of Wammako and Shagari. Ward details are outlined below.

Table 1: Selection criteria for treatment and comparison areas

Status	LGA	Wards	Rural/ Urban	Estimated reproductive population	Estimated contraceptive coverage	Number Ward health facilities
Treatment	Wammako	Kalambaina Girafshi	Rural	24,316	6.17%	3
		Gumbi Wajake	Rural	15,822	4.58%	3
Comparison	Shagari	Dandin Mahe	Rural	22,634	6.3%	3
		Shagari	Rural	16,856	3.6%	3

The maps below indicate the treatment and comparison wards in Sokoto state, Nigeria. The treatment wards are shaded purple, and the comparison wards grey.

Graphic 1: Maps of treatment and comparison areas



Sampling

The sample size was determined in G*Power. This difference-in-difference study has a binary outcome variable (uptake of contraception Y/N). As a result, we calculated a sample size (alpha = 0.05, power 0.8, odds ratio 1.5) that would enable a sufficiently powered binary logistic regression. This was based on minimum expected changes, as discussed within the Lafiya team, as we could not find literature that gave percentage increases or odds ratios on the uptake of Sayana Press in Nigeria or Africa. However, we did find a meta-analysis for contraceptive uptake programs in general in South Asia, which found odds ratios between 1.2-3.08 for a variety of programmes with a pooled estimate of 1.51.[1] This supported our initial estimate. This yielded a minimum sample size of 613. We added ~15% buffer for incomplete responses and loss to follow-up, yielding a sample of 700 individuals split evenly between the treatment and comparison groups.

Following the final data collection, we concluded the study with a sample of 544 individuals with baseline and endline readings, with a loss to follow-up of 15%. We subsequently cleaned this sample further to remove 18 cases of identified spillover into the comparison area, resulting in 526 individuals.

Table 2: Treatment and comparison sample sizes

Survey Respondent	Location	Total planned number	Total baseline	Total matched endline	Total cleaned endline
Women who have an unmet need for contraception	Wamakko (treatment)	350	316	266	266
	Shagari (comparison)	350	327	278	260
Total		**700**	**643**	**544**	**526**

Upon exploration of the data and analysis techniques, we chose to use a linear probability model rather than a logistic regression model, given the nature of our data and the straightforward interpretation of the marginal effects, especially when the focus is on differences between groups (see the analysis section for a more detailed explanation). As a

[1] Memon, Z.A., Tahmeena, Fazal, S.A. *et al.* Effective strategies for increasing the uptake of modern methods of family planning in South Asia: a systematic review and meta-analysis. *BMC Women's Health* 24, 13 (2024). https://doi.org/10.1186/s12905-023-02859-2

result, we computed the power for this statistical test based on a sample size of 526, an effect size f^2 of 0.38 (based on the change between the groups), three predictors and an α error probability of 0.05. This resulted in a power of 1 (highly powered). Our model remained highly powered with up to ten predictors. This high power, combined with our rigorous sample and matching processes, supports the validity of our counterfactual and the causal interpretation of our DiD estimates.

Survey design and deployment

To collect data, we distributed a short survey to women of reproductive age (18-45) who had an unmet need for contraception in the comparison and intervention wards in Wamakko and Shagari. The sampling started at a prominent point within each selected ward and then moved to the nearest household and interviewed all eligible participants. The survey team would then skip five households and move to the next household until the targeted sample size was reached. If women from a targeted household were unavailable, the team would return a second time to interview them. Households were geolocated and marked with chalk for follow-up at the endline.

The survey at baseline was designed to only select women who had an unmet need for contraception following an adapted definition of unmet need based on the WHO:

- **Women who are fecund** - Between 18-45, have recent menses and are not currently pregnant.
- **Sexually active women** - Given the cultural context, we used women who are married as a proxy for being sexually active.
- **Women who want to space their next birth** - Only 0.8% of all women surveyed reported they did not want any more children, but more than 87% said they did not want a child in the next two years.

We did not exclude women who were currently using contraception as we wanted to compare rates before and after the intervention and also check if there was a substitution effect when Sayana Press was introduced.

The survey was administered by a local team of women enumerators using SurveyCTO. Before data collection, all research team members received comprehensive training on research ethics, data collection instruments, interviewing techniques, and maintaining confidentiality. Informed consent was obtained from each participant before data

collection. The purpose of the study, voluntary participation, confidentiality, and the right to withdraw at any time were clearly explained.

The baseline and endline surveys can be viewed in Appendix 1.

At endline, the survey teams returned to the original households and interviewed the same women by matching their names and personal details to the existing master list of participants. If women were not there, the team followed up a day later to try and reach them and noted where women were no longer resident. The data was then cleaned to ensure only women who were present at baseline and endline were included in the analysis. Women who were lost to follow-up had often moved away from the area, sometimes due to divorce. We confirmed that the women lost to follow-up were not substantially different from those in the treatment and comparison groups to ensure there was no systematic sample bias (see Table 3 below).

Limitations

- **Timing of baseline survey:** The baseline survey was conducted at the end of Ramadan, a period during which women are less likely to travel. This may have reduced their opportunity to access contraception, potentially biasing baseline measures downward.
- **Non-randomization:** Due to logistical constraints, wards were not randomly assigned to treatment and comparison groups. Although we selected as similar wards as possible on multiple criteria, unmeasured differences may still exist between groups, limiting causal inference.
- **Survey-induced bias:** Surveying itself seems to have influenced behaviour, prompting more women to seek contraception. While this effect is present in both treatment and comparison areas (and controlled for in the analysis), it makes it difficult to separate the effect of Lafiya, from the survey effect and what would happen with no survey.
- **Spillover effects:** Despite efforts to choose wards that were geographically separate and keep Lafiya activities out of comparison areas, 18 known cases of spillover occurred, likely due to women travelling for family reasons, markets or for free contraception. We controlled for these cases by excluding them in the main analysis, however we also found our results robust even when they were included. There may be additional, unobserved spillover effects.

- **Interference from other programs:** Other family planning initiatives, such as a local radio programme (e.g Albishirin Ku Radio Drama Program) may have influenced contraceptive advice uptake and potential contraceptive uptake. Although we verified with Albishirin programme officers and MSI staff that there was minimal overlap of their interventions during the study period, the presence of other actors in the family planning space cannot be entirely ruled out.
- **Quality of government data:** The government data used to define and select treatment and comparison wards may be flawed. Low facility reporting and inconsistent administrative data may lead to either under or over-estimating true contraceptive uptake and can complicate assessing parallel trends.
- **Limited data on sustained usage:** With an eight-month study period, we have limited information on sustained and consistent contraceptive use. Future data collection is needed to assess long-term usage patterns and associated future outcomes, such as pregnancy rates. It would also be helpful to verify self-reported data where possible.
- **Intensive programme implementation:** The Lafiya programme was implemented more intensively in the study areas than its regular operational model in other states. Consequently, the observed effects may not generalize to areas where the programme is delivered at a lower intensity.
- **Social desirability:** Our model relies on self-reported data. Women may have been giving us socially desirable responses rather than true responses. However, the uptake reported by women is consistent with the upswings in contraceptive provision in government administrative data.
- **Survey instrument issues:** Our survey instrument had some issues like questions that needed more response options or inconsistent enumerator practice. While we did fix some of these issues at the endline, comparing baseline and endline data for some survey items can be difficult.

Analysis

Description of the data

The comparison and treatment groups were similar in key characteristics such as age, number of children, education levels, and baseline contraceptive uptake. However, women in the treatment group were in a better economic position, had higher employment rates, were almost 20% more likely to have received contraceptive advice, and had a 17% higher prevalence of ever using contraception compared to the comparison group. These differences were accounted for in our overall model. Additionally, no significant differences existed between participants lost to follow-up and those retained in the study.

Table 3: Description of the data

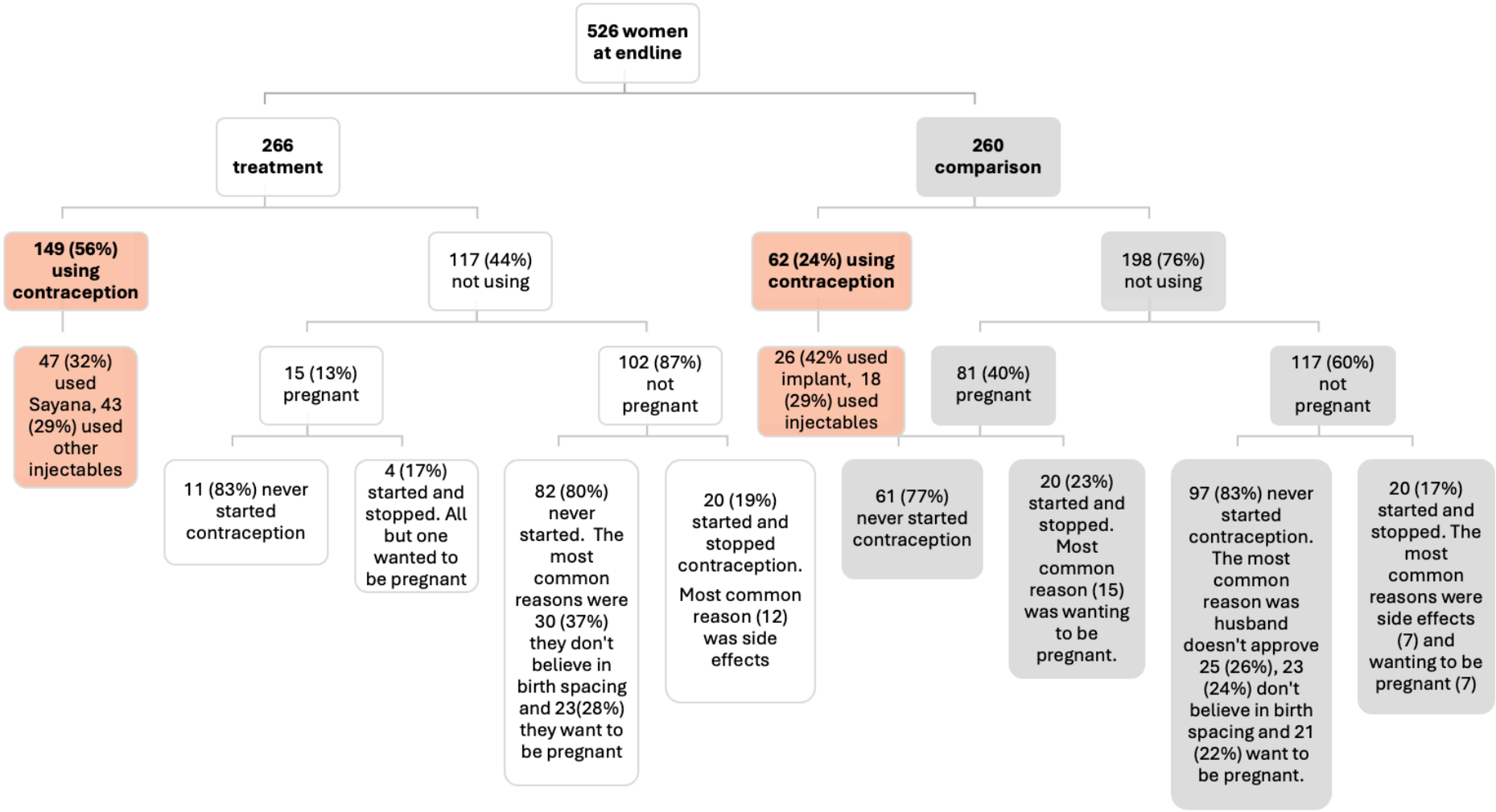
	Treatment	Comparison	Dropouts
Age (average)	29	29	29
Number of children (average)	3.92	4.04	3.7
Education No formal schooling (0) At least some primary schooling (1) At least some secondary schooling (2) At least some tertiary schooling (3)	0 - 58% 1 -12% 2- 24% 3 - 6%	0 - 66% 1- 8% 2 - 22% 3 - 4%	0 - 69% 1- 13% 2 - 15% 3 - 2%
Economic situation score % per category No money for food (1) Money for food and clothes only (2) Money for some savings (3) Money for some expensive goods (4)	1 - 2% 2 - 57% 3 - 19% 4 - 23%	1 - 4% 2 - 75% 3 - 19% 4 - 2%	1 - 4% 2 - 75% 3 - 19% 4 - 2%
% women working (endline)	85%	75%	-
% women who have ever used contraception (baseline)	37%	20%	28%
% women ever received advice (baseline)	94%	75%	78%

	(56% within the year, 84% in a health facility)	(26% within the year, 35% in a health facility)	
% uptake contraception (baseline)	2%	3%	3%
% want next child in over two years (baseline)	90%	84%	89%

Before considering our particular evaluation questions, we present a summarised event tree showing the outcome pathways for participants in both the treatment and comparison groups at the endline. This shows some interesting findings that the report will discuss further:

- Substantial differences between the treatment and comparison groups in contraceptive uptake
- Substantial differences between the groups in pregnancy rates
- Qualitative differences in reasons for not adopting or discontinuing contraceptive use.

Graphic 2: Event tree for respondents at endline



1. **Does Lafiya's program result in an increase in contraceptive uptake compared to similar comparison regions?**

At baseline, very few women in both the treatment and comparison areas were currently using contraception. By the endline, usage of contraception had risen in both groups but had risen more substantially in treatment areas, as shown in Table 4 below.

Table 4: Percent of women currently using contraception

Area	Baseline	Endline
Treatment	2%	56%
Comparison	3%	24%
Treatment (modelled counterfactual)	2%	22%

We then modelled the counterfactual case for the treatment group based on the results of the comparison group. The counterfactual endline is calculated using the following equation:

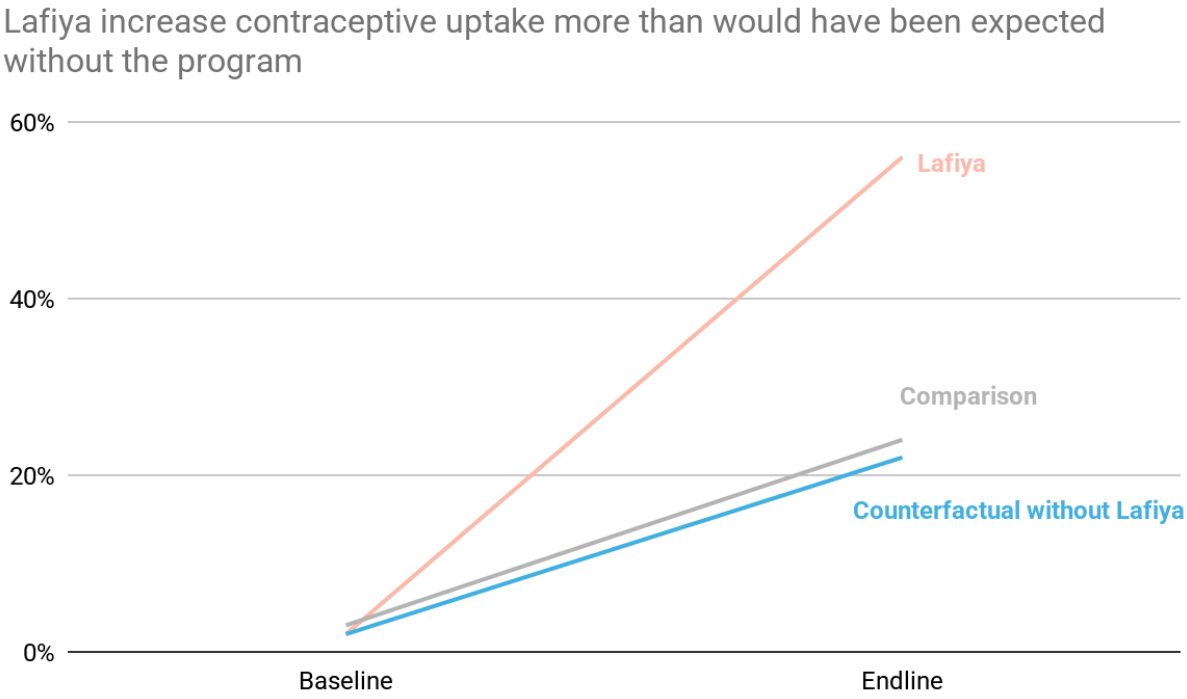
Treatment_counterfactual endline = (Treatment_baseline) - (Comparison_baseline-Comparison_endline)

Using this counterfactual case, we used the below equation to deduce the average treatment effect (ATT):

ATT = (Treatment_endline) - (Treatment_counterfactual endline)

This suggests that the Lafiya programme, on average, led to a 34% increase in the uptake of contraception for women in the treatment group, in addition to the increases that may have happened anyway without the programme.

The below graph illustrates the relationships between the treatment and comparison groups and the estimated treatment counterfactual. The difference we are most interested in is the difference between the treatment group's endline (pink line) and counterfactual endline (blue line) results - the difference between what happened and what would have happened without the Lafiya programme. This difference is 34%.



We then used a Linear Probability Model (LPM) to calculate a more precise DiD estimator (e.g. the average treatment effect above), alongside the statistical significance and the confidence intervals of this estimate and to control for additional variables that might contribute to contraceptive uptake.

An LPM applies ordinary least squares (OLS) regression to binary outcomes. Technically, a logistic regression model more correctly models the probabilities for binary data and this is what we prepared our sample for. However, logistic regression models have drawbacks - they are much harder to interpret and make other potentially problematic modelling assumptions on the behaviour of the error term. LPMs are much easier to compute and interpret; however, they also come with drawbacks. The main disadvantage of the LPM is that the true relationship between a binary outcome and a continuous explanatory variable is inherently nonlinear. This can result in two issues: 1) LPM probability estimates are not constrained to the unit interval (e.g. they can be below zero or above 1 and 2) the LPM imposes heteroskedasticity (uneven variance in the error terms) in the case of a binary response variable.

Based on the arguments laid out by Friedman (2012)[2], Deke (2014)[3], Von Hippel (2015)[4] and Timoneada (2021)[5], we have chosen to use an LPM in this case for its convenience, enhanced interpretability and because LPMs yield estimates of experimental impacts that are often just as accurate as those estimated by logistic regression. To further support this decision, we carried out the following tests:

1. We reviewed the predicted probabilities from the LPM and confirmed that no predicted probabilities in our data set were below zero or above 1.
2. We corrected for heteroskedasticity using the White test.

We first ran a basic LPM (model 1) to test if time (baseline to endline), membership in the comparison/treatment group, and the interaction between time and treatment group significantly predicted the binary outcome of current contraceptive uptake (1 = uptake, 0 = no uptake).

We then ran a more detailed model (model 2), controlling for a variety of variables that have been associated with increased contraceptive uptake in the literature:

- Level of education
- Socioeconomic status of the household
- Woman's working status
- Age
- Number of children
- If they have ever received advice on contraception
- If they have ever used contraception in the past

The results of both models are shown in the table below. This shows the regression coefficient, 95% confidence intervals in brackets and significance levels (*** p<0.001, ** p<0.01, * p<0.05, † p<0.1) as well as more broad model parameters.

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[2] Friedman, J. (2012, July 18). *Whether to probit or to probe it: In defense of the Linear Probability Model*. World Bank Blogs. https://blogs.worldbank.org/en/impactevaluations/whether-to-probit-or-to-probe-it-in-defense-of-the-linear-probability-model

[3] Deke, J. (n.d.). *Using the linear probability model to estimate impacts on binary outcomes in randomized controlled trials* (Mathematica Policy Research Reports No. 62a1477e274d429faf7e0c71b). Mathematica Policy Research; https://ideas.repec.org/p/mpr/mprres/62a1477e274d429faf7e0c71ba1204b2.html

[4] von Hippel, P. (2015, July 5). *Linear vs. logistic probability models: Which is better, and when?* Statistical Horizons. https://statisticalhorizons.com/linear-vs-logistic/

[5] Timoneda, O. C. (2021). *Estimating group fixed effects in panel data with a binary dependent variable: How the LPM outperforms logistic regression in rare events data*. Social Science Research, 93.

Table 5: Difference-in-difference estimates from models 1 and 2.

Variable	Model 1	Model 2
Time period	0.204, [0.144 - 0.264] ***	0.196, [0.137 - 0.255] ***
Treatment group	-0.015, [-0.08 - 0.044]	-0.096, [-0.157 - 0.036] **
Time period x treatment group	0.338, [0.253 - 0.421] ***	0.353, [0.271 - 0.434]***
Age	-	0.005, [0.001 - 0.009]*
Number of Children	-	-0.009, [-0.022 - 0.003]
Working status	-	0.023, [0.026 - 0.072]
Socioeconomic status of HH		0.028, [0.027 - 0.863]***
Education	-	0.004, [-0.004 - 0.013]
Ever Used FP at Baseline	-	0.147, [0.099 - 0.194]***
Received FP Advice	-	0.131, [0.068 - 0.194]***
N	1052	1052
R2	0.286	0.345
Adjusted R2	0.283	0.339
F	139.7***	54.87***

Both models were statistically significant (R^2 = 0.281, 0.340, F=(1030,1023) = value [133.9, 52.77 p = <0.001). This means the models explain approximately 28-33% of the variation. This lower explanatory power is typical in LPM models with binary data.

In model 1, both time (the transition from baseline to endline) and the interaction between time and the treatment group significantly predicted contraceptive uptake. Participants at endline had, on average, a 20% higher chance of using contraception compared to baseline (95% CI: 15% - 27%, p < 0.001). The interaction term between time and treatment group specifically captured the added benefit for the treatment group of the Lafiya programme. The interaction between time and the treatment group was greater at 0.34, indicating that

the Lafiya Programme, on average, **led to a 34% increase in contraceptive uptake for individuals in the treatment group at endline** (95% CI: 25% - 42%, $p < 0.001$). This suggests that the Lafiya programme had a substantial impact on the treatment group's likelihood of adopting contraception.

In model 2, we controlled for several variables that may also influence contraceptive uptake. Given our model is highly powered, we found several statistically significant relationships. However, those that are highly statistically significant and of the most practical significance include:

1. Being in a Lafiya treatment area at endline was the greatest predictor of contraceptive uptake in both models. This additionally increased, on average, the likelihood of taking up contraception by 34-35% on top of temporal and group effects. This aligns closely with model 1, showing the robustness of this estimate.
2. Temporal effects were the second largest predictor. This indicates that time passing increased the likelihood that participants would use contraception on average by 20%. This may indicate an increase in contraceptive provision over the year by the government and other actors or potential unintended and unaccounted-for spillover effects from the Lafiya programme.
3. Having ever used contraception at baseline increased the likelihood of taking up contraception at the endline by 15% on average.
4. Having ever received contraception counselling increased the likelihood of taking up contraception at the endline by 13% on average.
5. Being in the treatment group at baseline was associated with a 9.1% reduced likelihood of taking up contraception. However, the treatment group showed a much larger improvement over time, suggesting the Lafiya programme was particularly effective at addressing whatever barriers were causing the initial lower usage.

Government administrative data (see graph on page 7) also supports these findings, showing an increase in treatment and comparison groups across the programme time period but with greater increases in the treatment areas. However, this data must be read with the caveat that the government administrative data is vulnerable to gaps and delays and lower levels of contraceptive provision could result from underreporting.

To ensure robustness, we also ran the model with the additional 18 spillover cases and confirmed that their exclusion did not drive the observed effect. In model 3, compared to

models 1 and 2 above, the effect of the intervention decreases from an average 34% increase in the likelihood of taking up contraception for the treatment group relative to what would have been observed in the absence of the intervention to only a 29% increase. However, this shows that the Lafiya programme's effects remain practically and statistically significant even if spillovers are included.

Table 6: Difference-in-Difference model 3 robustness check

Variable	Model 3
Time period	0.248, [0.188- 0.308] ***
Treatment group	-0.021, [-0.080 - 0.039]
Time period x treatment group	0.293, [0.208 - 0.378] ***
N	1088
R2	0.273
Adjusted R2	0.271
F	136***

Pregnancy outcomes

Studying pregnancy outcomes was not a core aim of our study; however, it is noteworthy that large differences emerged between the treatment and comparison groups, which may be connected to increases in contraceptive uptake in the treatment area. No pregnancies were reported at baseline, as pregnant women were excluded from the study given they did not have an unmet need for contraception. At the endline, the treatment group had 15 reported pregnancies (6% of the sample population), compared to 81 reported pregnancies (30%) in the comparison group (see Table 7).

Table 7: Pregnancy outcomes in treatment and comparison areas over time

Area	Baseline	Endline
Treatment	0	15 (6%)
Comparison	0	81 (30%)

Despite these differences, we could not conduct a DiD analysis for pregnancy outcomes because we lacked baseline data for pregnancy rates in the respective areas necessary to establish pre-treatment differences and substantiate the parallel trends assumption. Although we collected data on the number of children (a proxy for past fertility), this measure does not capture current conception patterns. The fact that the comparison area had a slightly higher fertility rate might indicate a higher current conception rate relative to the treatment area.

Furthermore, our study was designed to measure the uptake of contraception and was not designed to disentangle the complex, reciprocal relationship between contraceptive uptake and pregnancy—where contraception prevents pregnancy, yet pregnancy can also render contraception unnecessary. Without precise data on the timing of pregnancies and medical confirmations of pregnancy, the nature of this relationship remains unclear.

In future research, we plan to examine pregnancy outcomes over a longer period using robust baseline and administrative data on pregnancy rates.

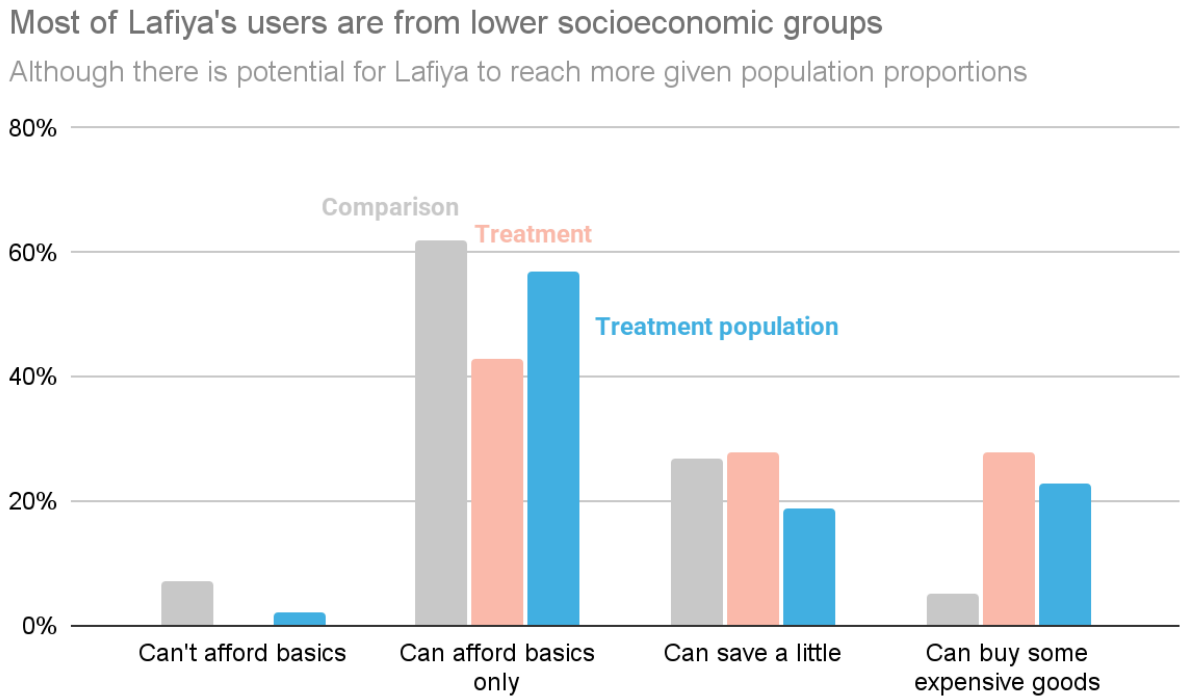
2. How does uptake vary amongst women of different ages, economic situations and family situations?

In general, Lafiya programming mostly reaches women aged 18-31, a similar proportion of age groups that are reached in comparison areas. Lafiya reaches slightly more women with 0-2 children, but on the whole, Lafiya mostly reaches women with 3-6 kids, which is similar to the comparison areas.

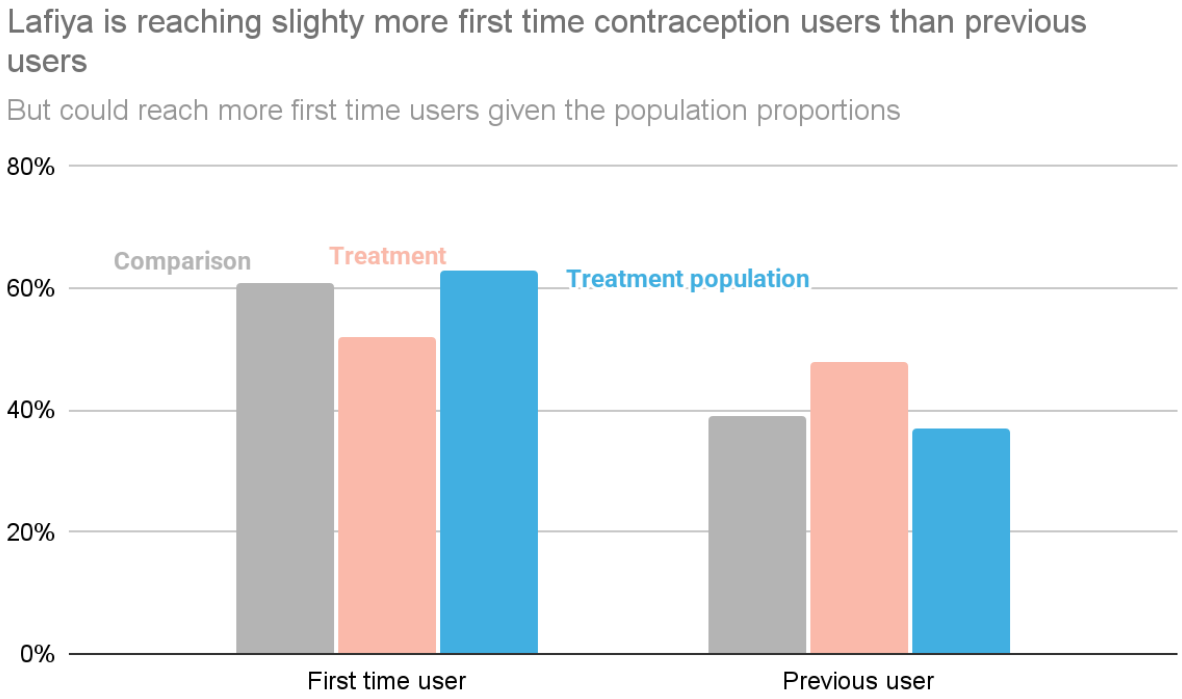
When we consider education and economic factors, we find that Lafiya is reaching the same proportions of women from different educational backgrounds as those in the comparison area, with most women having no formal education. When it comes to economic circumstances, we do find some interesting differences. In Sokoto, where both the treatment and comparison areas are situated, 90% of families live in multidimensional poverty.[6] We asked families to rate their level of income sufficiency on a 1-4 scale, 1 indicating they did not have the means to buy food and clothes (basics), to 4, which indicates they have the means to buy certain expensive goods like TVs. We did find some differences between the treatment and comparison areas, with 21% more people in the treatment group in the top income sufficiency group versus the comparison area. However, even accounting for these LGA differences, the breakdown of Lafiya users tends to favour

[6] Nigeria Multidimensional Poverty Index. (2022). *Nigeria multidimensional poverty index* [Report]. https://ophi.org.uk/sites/default/files/2024-05/Nigeria_MPI_2022_report.pdfpdf

higher socioeconomic groups, indicating that more could be done to reach lower socioeconomic users. In both comparison and treatment areas the majority of women who took up contraception were working, in line with population proportions.



Another consideration is whether Lafiya is reaching women who are first-time users of contraception or reaching women who are previous users. Both groups are important, but previous users may have been more likely to take up contraception without Lafiya, given their previous experience compared to first-time users. Lafiya reaches similar proportions of first-time and previous users. In the comparison areas, more first-time users took up contraception, which may be the result of the difference in the treatment and comparison groups at the outset, with 17% more people in the comparison area having never used contraception. However, when we look at the treatment population proportions, we can see that Lafiya's users do skew to previous users compared to the population proportions, indicating there may be room to improve targeting to new users.



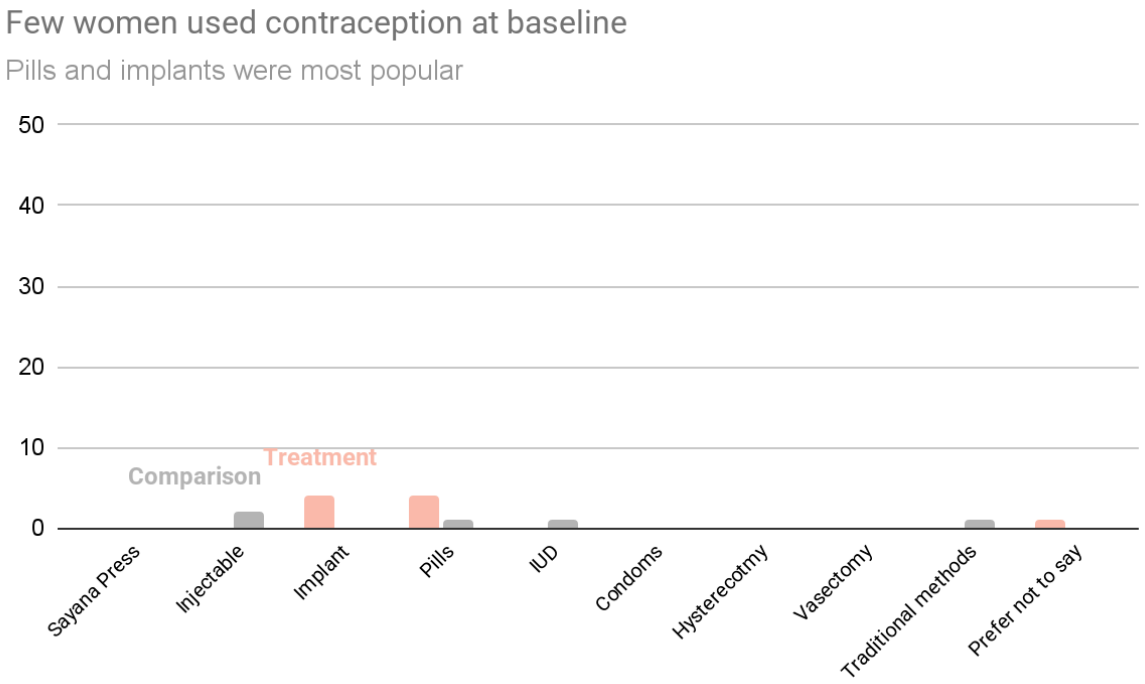
It must be acknowledged, though, that this is difficult in the cultural context. Women who are new users are often younger and have fewer children, and while Lafiya is doing well at reaching these women, there are cultural expectations that women should not be using contraception when they are young or recently married so they can bear children. Contraception is often spoken more about as birth or child spacing methods. In addition, too much focus on new users can obfuscate important gains in helping improve the sustainability and consistency of contraceptive use in previously lapsed users, which is also very important for reducing unwanted pregnancies, especially given the very low contraceptive use at baseline.[7]

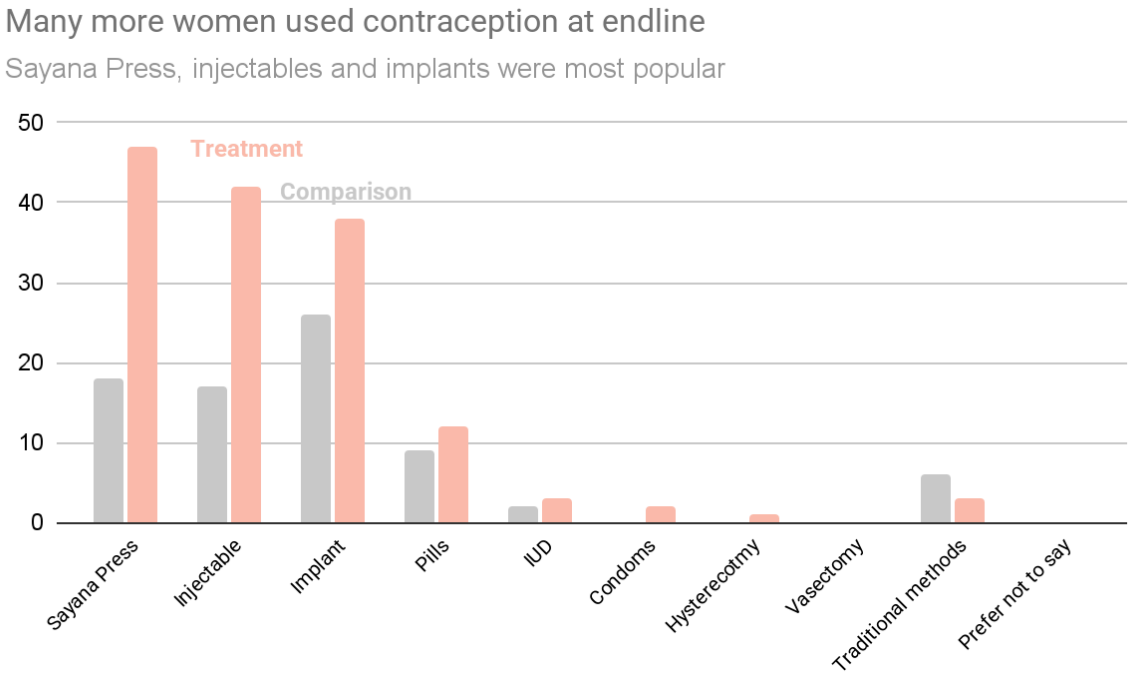
3. **What contraceptive methods were women using, where did they get these methods, and how consistently were they using these methods?**

When we compared contraceptive method usage at baseline and endline we can see that very few women were using contraception at baseline and those tended to prefer pills and implants. There was no reported usage of Sayana Press. By endline, many more women

[7] Reichwein, Barbara, Michelle Weinberger, kenzo fry, and Olivia Nuccio. *Meeting Family Planning 2020 Commitments – the Importance of Moving beyond First Time Users*, 2013. https://doi.org/10.13140/RG.2.1.3366.5761.

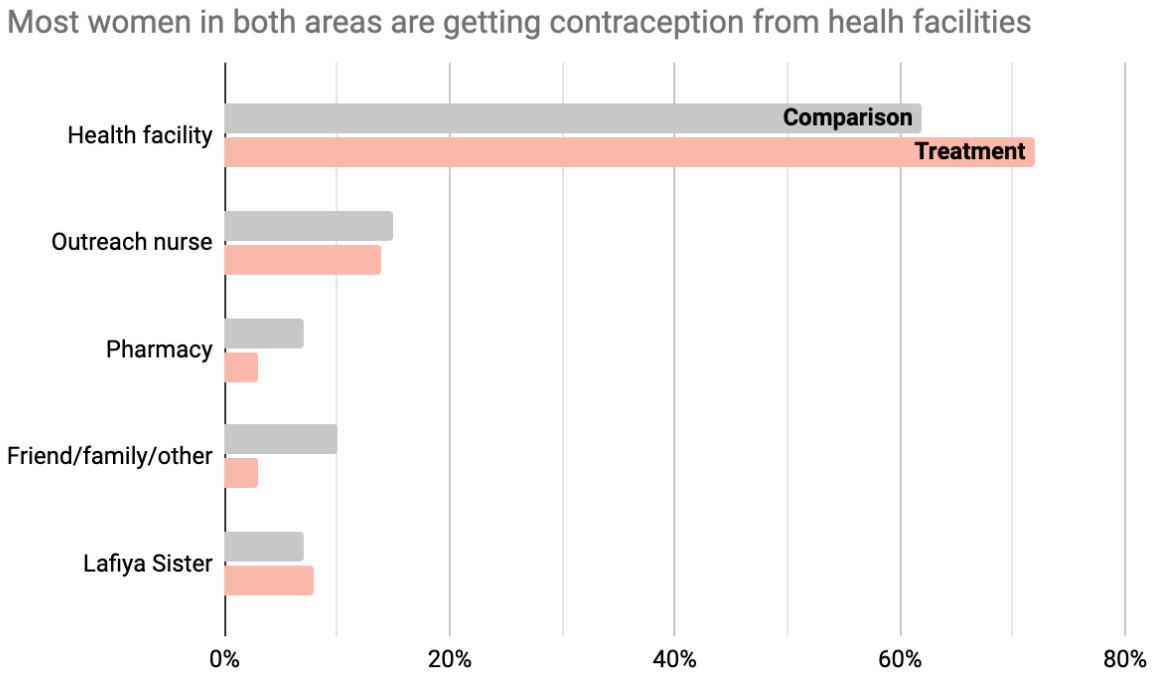
were using contraception, with Sayana Press, injectables and implants much more common across both groups, although more so in treatment areas.[8]





[8] Here we have included the 18 cases of Sayana press in the comparison area for completeness.

We asked women at the endline where they received their contraceptive method, and their answers surprised us. We would have expected more women in treatment areas to report getting contraceptives from an outreach nurse or Lafiya Sister, given the programme ran outreach and house-to-house visits alongside health centre outreach. However, most women reported getting contraception from a health facility (72% in treatment areas, 62% in comparison areas), with few reporting contraception from other sources. Given that the Lafiya Sisters are registered nurses with their local health facility, it is likely that women are receiving contraception from a Lafiya-trained nurse, but they do not know it.



There were some instances (4 cases) of women in comparison areas reporting they got contraception from a Lafiya Sister. It is unclear if these women were additional spillover cases or if they simply did not understand the term 'Lafiya Sister' given that in the local language (Hausa) this would translate to 'Health Sister.' This may indicate we need to be more precise in future surveys when asking about Lafiya Sisters. Lafiya may also want to increase its brand salience, although this could detract from government and local ownership, which is vital for sustainability.

Self-reported consistency of contraceptive use

We asked women who were using contraception at baseline and endline if they had been able to use the methods without breaks to assess the consistency of use. We found that

both groups reported much better contraceptive consistency at the endline, but admittedly from a very low baseline with few cases.

Table 8: Percent of women who reported using contraception without breaks in treatment and comparison areas

Area	Baseline	Endline
Treatment	2 (40%)	130 (87%)
Comparison	1 (11%)	52 (84%)

Consistency was fairly similar in comparison and treatment areas, likely because longer-acting methods like Sayana Press, injectables and implants predominated over daily dose methods like pills which were more common at baseline. As we do not know exactly when women first received contraception in the study period, it is hard to know how many of these women would have needed to administer another 'dose' of contraceptives like Sayana Press or injectables. This makes it hard to judge whether this high level of consistency is over multiple doses or just one. We also know that it can often take time for women to stop using contraceptives due to side effects. This promising result requires further follow-up research to ascertain a better consistency estimate.

The most common contraceptive methods used by women who reported using contraception inconsistently were injectables (10 cases), implants (9), followed by pills, traditional methods and Sayana Press (3 cases). In the three cases where women used Sayana Press inconsistently, the reasons given were bleeding and missing their period. It is very positive that there were few issues with inconsistency reported by Sayana Press compared to other contraceptive methods. This further underlines the importance of discussing side effects and helping women self-inject to overcome consistency barriers.

Table 11: Reasons why women struggled with consistent use of different methods

Method	Reasons given
Sayana Press	Bleeding (2)
	Because I miss my period
Other injectables	I tried injection method but it did not work as I had a miscarriage
	Because I want to be pregnant/have children (3)
	Bleeding (2)
	I used for 2 months but the effect lasted for 6 months, I was not happy I also used implant but experienced excess bleeding

	Because my husband does not approve and he travels a lot
	I skipped some days and then became pregnant (2)
Implant (2)	Because it was not available at the due time
	Because I want to get pregnant (3)
	Because I experienced problem (4)
	Because I am afraid of side effects
Pills (3)	Because I experience bleeding (2)
	Because my husband travels a lot
	I skipped my pills and got pregnant that is the reason I stopped until I deliver
	I want to be pregnant (2)
Other non-modern methods (8)	Because I heard the pills lasts for 3 years
	It doesn't work (2)
	Because if I give birth it takes time before I get pregnant again
	Because I experiences side effect which include dizziness and bleeding

For other contraceptives, common barriers to consistent use were side effects or problems, particularly bleeding, husband travelling a lot (which in the cultural context can make contraception more difficult as it can raise suspicions of infidelity) and method failure.

3. For women who used Sayana Press, how many self-injected and why/why not?

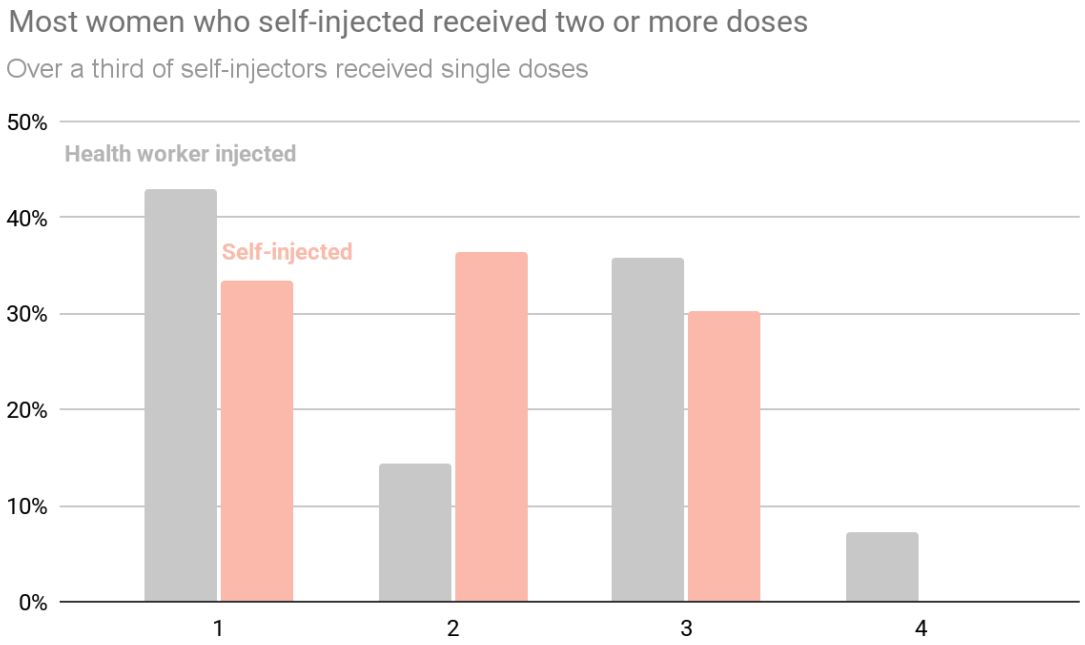
We observed high self-injection rates for women who used Sayana Press in the treatment area and the 18 spillover cases of Sayana Press in the comparison group. We believe self-injection rates may have been higher in the comparison area firstly because there are less cases and secondly because women seeking contraception may have been more proactive and travelled farther to procure contraception given this was not being offered in their LGA and so had greater incentive to learn to self-inject and take doses home.

Table 9: Self-injection rates

	Comparison	Treatment
Self-injection (endline)	83% (18 cases)	70% (47 cases)

The idea behind teaching women to self-inject is that they can take Sayana Press doses home to administer themselves, which should improve consistency and contribute to longer-term contraceptive protection. We would hope to see more women who self-injected receiving more doses of Sayana Press. In the survey, we asked women how many doses of Sayana Press they had received, including those given by a health worker

and/or doses they took home. Women who did and did not self-inject reported a similar mean number of doses received (1.9, 2.17), and over 30% of women who self-injected only received one dose. This may be due to not wanting to receive additional doses due to lack of confidence or fear, or partly due to government regulations during the study. Initially, women were only allowed to receive one additional dose (two total) upon self-injection. This subsequently changed to three additional doses (four total). Lafiya monitoring data shows that 86% of Sokoto self-injectors were offered two doses and 14% were offered one. There were no instances of three doses offered. This could indicate three and four doses in the graph below show repeat visits, which is positive.



It is recommended that Lafiya conduct more research to ascertain the standard and actual operating procedures for Lafiya Sisters when they teach women to self-inject, how many Sayana Press doses self-injectors get, and why women who self-inject are not always receiving or accepting more doses. This is important for improved contraceptive consistency and the long-term sustainability of the Lafiya programme.

At endline 21 respondents who reported current Sayana Press use stated that they did not administer the method via self-injection, 15 of which were from a Lafiya area, while 5 were from a non-Lafiya area (spillover cases). We asked women who did not self-inject why they did not self-inject. The most common responses were preferring a provider administration (8), lacking confidence in their ability to do so (5), fear of self-injection, and having a relative at home to do it for them. One woman reported fear of being discovered by her husband.

Table 10: Qualitative reasons for not self-injecting

Reason	Quotes
Preference for provider administration (8)	'I prefer to get it from a healthcare provider'
Lack of confidence (5)	'Because I don't want to do it myself to avoid complication'
Fear	'I am afraid of doing it by myself'
Relative assistance (1)	'I have a relative that is a healthcare provider at home'
Husband disapproval (1)	'I don't want my husband to know'

The most common reason for not self-injecting among users was a preference for provider administration (9, 45% of all responses). These responses included clear statements on favouroing provider administration (e.g. "I prefer to get it from a healthcare provider") as well as responses simply indicating that provider administration is the mode of injection that they use (e.g. "I receive the dosage from a healthcare provider"). Reasons for the preference for provider administration could include underlying fears or anxieties related to self-injection, an affinity for visiting health facilities to receive family planning care or a lack of awareness that Sayana Press can be self-injected.

The second most common reason for not self-injecting Sayana Press was a lack of confidence in the ability to self-inject (5). These responses included statements on the perceived inability to self-inject (e.g. "I cannot do it", "Because I don't want to do it myself to avoid complication"). Some expressed reasons for low confidence in their ability to correctly self-inject (e.g. "Because I don't want to do it myself to avoid complication". 4 out of 5 of these responses were among participants that had only received one dose of Sayana Press, among which 1 response indicated intention to try to self-inject the next time they require a new dose. This suggests that that the self-injection adoption of Sayana Press could be a gradual process in which users build confidence to self-inject as they receive more doses.

Three responses indicated fear as the reason for not self-injecting (e.g. "I am afraid of doing it by myself"). Two respondents indicated that their husband or relative administered Sayana Press, while 1 respondent (the only respondent who had received 4 doses of Sayana Press and reported not self-injecting) stated that they opt for provider administration due to husband disapproval and fear of being discovered at home ("I don't want my husband to know").

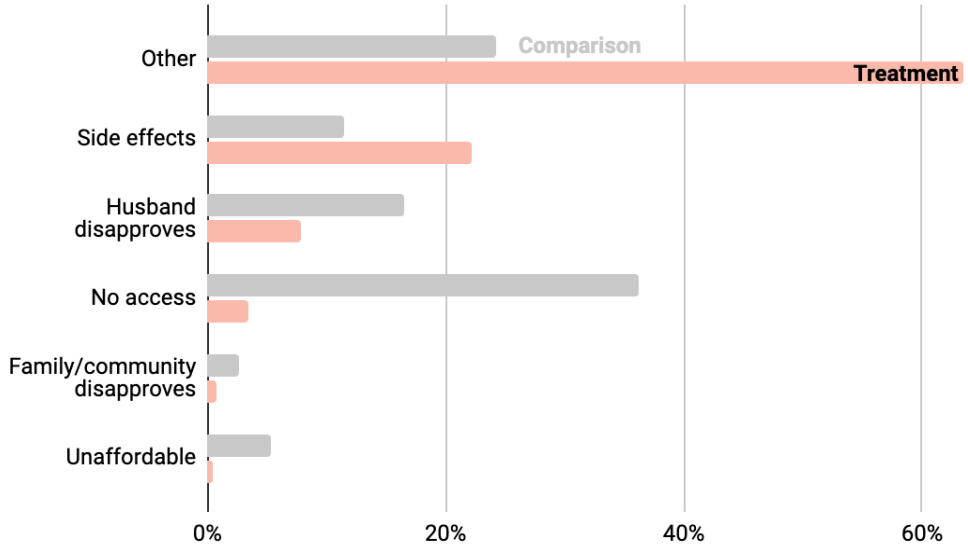
4. Why did women not take up family planning or stop using family planning?

We asked women their main reason for not currently using contraception. There were large discrepancies between the answers given at baseline and endline and because of this we have low confidence in the comparability of these results. At baseline, we had a lot of 'other' responses. We made efforts to reduce this by updating the options in our survey to cover more response items (including, for example, a desire to be pregnant and holding an anti-contraception belief) and improving the training for enumerators who, in some cases, were miscoding answers as 'other.'

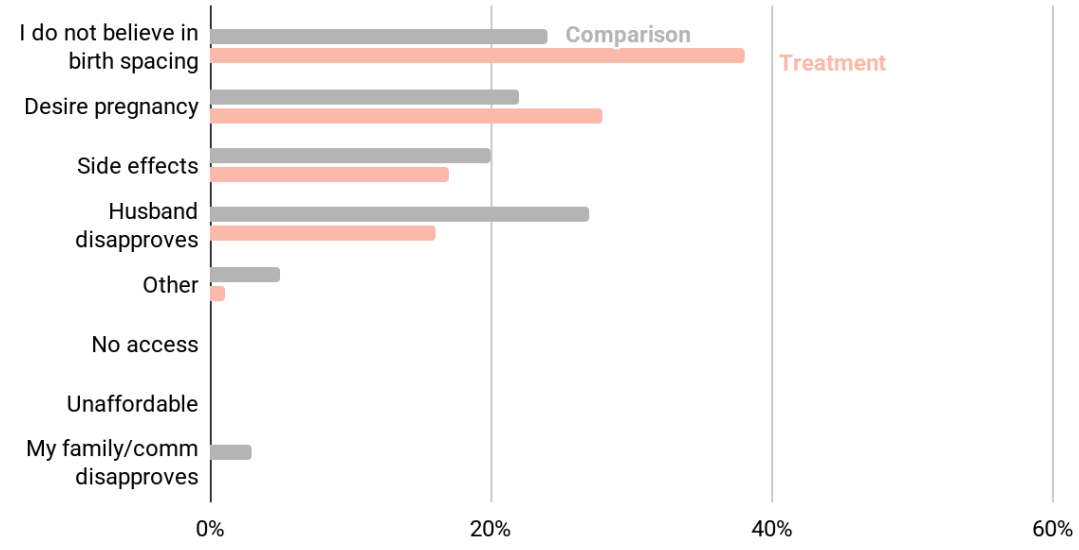
At baseline, for women in our treatment areas, the main reasons reported for not using contraception were 'other' followed by 'side-effects'. There were not many concerns about lack of access or affordability, which is interesting given the acute stockouts and access barriers in rural areas. In the comparison area, the main reasons reported at baseline for not using contraception were 'lack of access' and 'other'.

By endline, the main reasons reported by women in Lafiya treatment areas for not using contraception were 'not believing in birth spacing', 'wanting to be pregnant,' and 'side effects.' This indicates that the lack of these first two response options at baseline drove many 'other' responses. In the comparison area, the main reasons reported were 'husband disapproves', 'not believing in birth spacing', and 'wanting to be pregnant'. Interestingly, access barriers were cited less or not at all at the endline as a reason not to use contraception. This may be due to increases in contraceptive advice and provision, perhaps triggered by our survey or other programs, that made women realise that access was not their foremost barrier. It may also be that access is *a* reason not to use contraception but not the *primary* reason - social, cultural, familial, and personal preferences come first.

At baseline 'other', no access and side effects were the main reasons not to use contraception



At endline, no belief in birth spacing and a desire for pregnancy were most common reasons to forego contraception

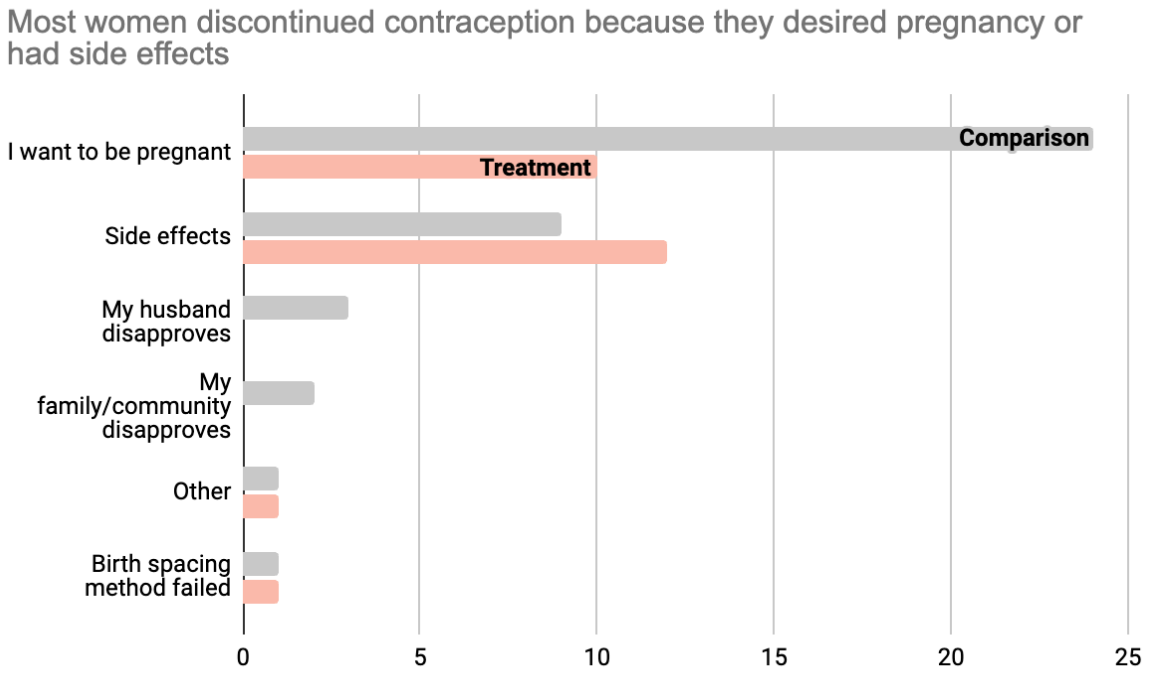


It is also interesting that in both treatment and comparison areas, the percentage of women reporting that their reason for not using contraception was husband disapproval increased over the programme period. This may indicate some backlash in families without outreach to husbands.

While we do not have high confidence in these findings given the survey changes, it seems that access and affordability were not primary reasons to forego contraception, especially at the endline, despite what we know about stock out and accessibility challenges. It seems there may be a disconnect between the normative need (what we know is a need from research and experts) and the felt need (what women report as their own needs and barriers based on their lived experience). This could be due to cultural bias in admitting women don't have access or sufficient resources, or could be that for women personal, cultural and familial reasons dominate their way of thinking and access and affordability challenges are secondary issues that come up once they have surmounted other barriers. This may indicate that for Lafiya, there continues to be value in explaining the benefits of birth spacing and how this fits in with cultural and religious beliefs, working with husbands to improve their knowledge and approval of contraception, and ensuring women are properly counselled and understand potential side effects of contraceptive options and mitigation measures.

Reasons for discontinuation

Throughout the programme, 64 women started and then stopped contraception - 24 in the treatment area and 40 in the comparison area. The below graph illustrates their reasons for stopping.



Positively, the reason most women gave for stopping contraception was wanting to be pregnant. Again, while we included options of unaffordability or access difficulties in the survey, these were not selected by any participant as reasons to stop contraception by endline. After desiring pregnancy, the next most common reasons to stop were side effects, followed in the comparison area by husband and familial disapproval. Looking specifically at the treatment area, we see that for women who stopped using contraceptives because of side effects, most were using injectables like Depo-Provera. One case of method failure was also reported using injectables. Women using Sayana Press who subsequently stopped all wanted to be pregnant.

This data again emphasises the importance of engaging with women to teach them about side effects and mitigation, helping women maintain consistency of use, and engaging husbands in contraceptive discussions.

5. Do women in a Lafiya Sister catchment area have improved access to family planning counselling than women in similar comparison areas?

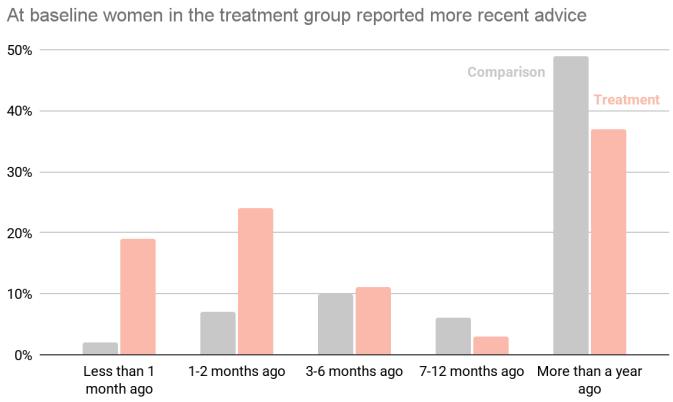
At the baseline, rates of contraceptive advice were already very high across both comparison and treatment areas. Women were receiving advice mostly from. By endline, the percentage of women who had received advice remained unchanged in the treatment area, but did increase in the comparison area, potentially indicating that the act of speaking with women about contraception may have prompted them to get advice or that other government or non-government programmes were running.

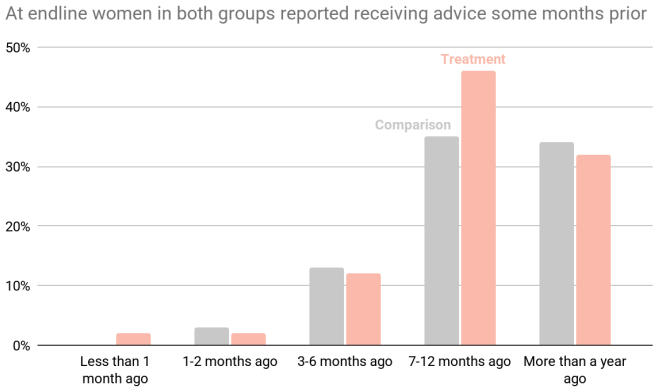
Table 12: Percentage of women who report they received contraceptive advice

Ever received advice	Comparison BL	Comparison EL	Treatment BL	Treatment EL
Yes	76%	85%	93%	93%

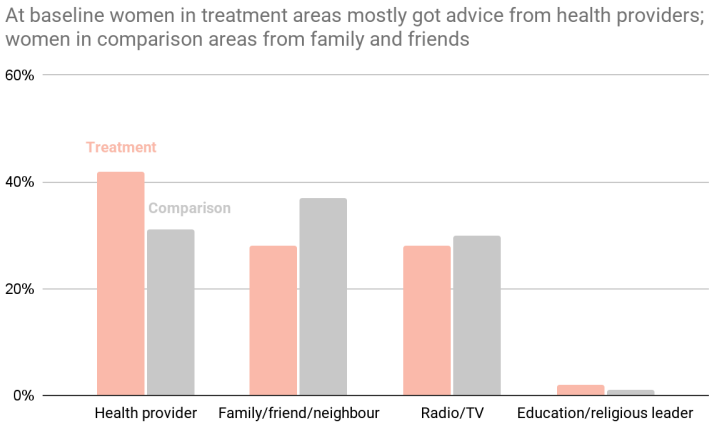
When we asked women when they last received contraceptive advice the results were counterintuitive. We would have expected to see more women reporting advice within the last six months. Instead, we saw that more women reported receiving advice 7-12 months plus. This could indicate that speaking with women encouraged them to get advice early on in the programme period. Alternatively, it could indicate that another program providing contraceptive advice was running with a push just before our baseline, which increased

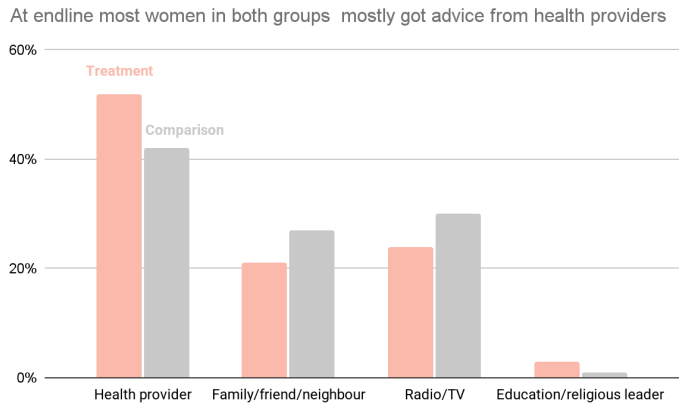
reporting, especially in our treatment areas. We know the [Albishirin Ku Radio Drama Program] ran in both areas but stopped broadcasting by April 2024.





To consider these theories further, we explored where women reported getting advice from and how this changed over the programme period. Women could select different sources of advice, which we collapsed into four key categories: health provider (including Lafiya Sister), family/friend/neighbour, Radio/TV and education/religious leader.





At baseline, most women in the treatment areas sought contraceptive advice from healthcare providers, whereas women in the comparison areas were more likely to rely on friends, family, and neighbours. By endline, both groups saw a ~10 percentage point increase in the proportion of women reporting they received contraceptive advice from a healthcare provider, making it the most common reported source. Notably, the comparison group saw a shift in where they sought advice. This suggests that the survey itself may have

motivated women in these areas to seek advice, potentially providing them with information on where to access it. The Lafiya programme did not appear to be more successful than the comparison area at improving access to advice.

6. Do women in Lafiya areas have better quality counselling?

To understand quality, we looked at both satisfaction with counselling and the reported outcome of the counselling. We asked women to score their counselling satisfaction on a 0-5 point Likert scale. We found that satisfaction with contraceptive advice increased across both comparison and treatment groups from baseline to endline, with an average increase of 0.63 points in the treatment group and 0.4 points in the comparison group. However, a difference-in-difference regression model revealed that there was no significant relationship between the intervention and changes in satisfaction scores over time, likely given the significant differences at baseline, with our treatment group already receiving more counselling and reporting higher satisfaction levels. Satisfaction among women in the comparison group may have increased due to survey bias, because the advice was proactively sought, or because the survey gave women more information or confidence to enter these discussions, which may have influenced their perceived satisfaction.

Table 13: Average advice satisfaction scores

	Treatment BL	Treatment EL	Comparison BL	Comparison EL
Advice satisfaction (average 0-5)	3.76	4.39	3.51	3.91

We also asked women what happened as a result of the contraceptive advice they received. Women could select between four options - took no action, started contraception, changed contraception or stopped contraception. Table 10 below shows the percentage of women selecting each option at baseline and endline.

Table 10: Result of advice

	Treatment BL	Treatment EL	Comparison BL	Comparison EL
Started	**25%**	**56%**	**21%**	**32%**
Changed	7%	2%	2%	3%

Took no action	**66%**	**42%**	**76%**	**64%**
Stopped	3%	0%	1%	0.5%

Table 10 demonstrates improvements across both groups over time. In the treatment group, 31% more women reported starting contraception following advice, while 24% fewer reported taking no action. In contrast, the comparison group saw an 11% increase in contraceptive uptake and a 12% decrease in taking no action. We performed a Stuart–Maxwell test of marginal homogeneity on the paired baseline and endline data for each group, finding statistically significant shifts in both groups—with a stronger significance in the treatment group ($p < 0.001$) compared to the comparison group ($p = 0.007$). Effect size analysis based on odds ratios further revealed that the most substantial changes were driven by transitions between the 'took no action' and 'started contraception' categories, with the treatment group exhibiting a larger odds ratio (3.7) than the comparison group (2.8).

Overall, quality contraceptive advice from health providers is an important part of the Lafiya programme, ensuring women are empowered to select contraception that best meets their needs. However, improving access to contraception advice from health providers alone was not a strong driver of Lafiya's impact in this study. The reported quality of counselling and the result of counselling improved in both treatment and comparison areas, although slightly more so in treatment areas.

Summary and recommendations

The Lafiya programme significantly increased contraceptive uptake over the study period. In the treatment group, uptake rose from 2% at baseline to 56% at endline compared to an increase from 3% to 24% in the comparison group—an additional net increase of 34 percentage points attributable to the intervention. Intriguingly, only 6% of women in treatment became pregnant versus 30% in the comparison group, a finding that warrants further investigation to explore potential causal links.

Lafiya primarily reaches women in their reproductive prime (aged 18–31 with 1–4 children). Most users have little formal education and are in lower socioeconomic groups. Given population demographics, there is room for Lafiya to expand outreach to more poor and first-time users.

From this study, it appears that the Lafiya programme's main causal mechanism is not simply increasing access to contraceptive advice from reputable sources—access to advice was already high at baseline, and advice from health professionals increased similarly in both groups by endline—but rather enhancing the quality of counselling to address women's felt needs and then promptly overcoming access and affordability barriers by providing free and easy contraception. While many women have a theoretical unmet need for contraception given their preferences and circumstances, this does not always translate into an expressed felt need; most women indicated that they do not use contraception because they either do not believe in it, desire pregnancy, worry about side effects, or face husband disapproval, findings that have also been validated in the literature.[9] However, we also know that access and affordability barriers persist.[10]

For the Lafiya programme, the key appears to be in delivering high-quality, accessible counselling that effectively communicates the benefits of contraception (or birth spacing) and alleviates personal, social, cultural, and familial barriers, and then ensuring immediate access to effective, affordable and easy to use contraceptive products. In our study, we saw that the quality of counselling and resultant positive actions improved more in the treatment group than in the comparison group. Methods used in the treatment group shifted from pills and implants at baseline to Sayana Press, injectables, and implants at endline, with 87% of Sayana Press users reporting consistent use and only three users discontinuing. No users reported method failure. 77% of users opted to self-inject, and most received at least two doses, increasing the likelihood of prolonged use.

Based on these findings and to encourage further improvement, this study recommends the following:

Program

- Consider ways to reach more women from lower socioeconomic backgrounds and first-time users.
- Continue to explain the benefits of birth spacing by linking this to social, cultural and personal barriers. Ensure women are properly counselled on side effects.

[9]Durowade KA, Omokanye LO, Elegbede OE, Adetokunbo S, Olomofe CO, Ajiboye AD, Adeniyi MA, Sanni TA. Barriers to Contraceptive Uptake among Women of Reproductive Age in a Semi-Urban Community of Ekiti State, Southwest Nigeria. Ethiop J Health Sci. 2017 Mar;27(2):121-128. doi: 10.4314/ejhs.v27i2.4. PMID: 28579707; PMCID: PMC5440826.

[10] Sinai, I., Omoluabi, E., Jimoh, A., & Jurczynska, K. (2019). Unmet need for family planning and barriers to contraceptive use in Kaduna, Nigeria: culture, myths and perceptions. Culture, Health & Sexuality, 22(11), 1253–1268. https://doi.org/10.1080/13691058.2019.1672894.

- Investigate the potential for male backlash and consider how to engage men better in contraceptive discussions.
- Review protocols and practices for taking home doses following self-injection to ensure as many doses as possible are being provided to self-injectors.

Research

- Investigate and support improvements to government data collection practices.
- Undertake further longitudinal research to gather better data on the consistency of contraceptive use and disposal.
- Undertake additional research with endline only groups to quantify the survey effects.
- Conduct a future study to understand the causal linkages between increased contraceptive uptake and pregnancy outcomes.
- Review and refine future survey instruments, paying particular attention to consistent question wording and response options, and carefully explaining the term 'Lafiya Sister.'

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Appendices

Appendix 1: Baseline and Endline Survey

Baseline survey eval 2024

Field	Question	Answer
enumerator *(required)*	Please select the unique name for enumerator field. (Edit this label to meet your needs...)	
Date_survey *(required)*	Date of survey	
LGA *(required)*	What LGA are you completing this survey in?	
		0 Shagari
		1 Wamako
Ward_wam *(required)*	What Ward are you completing this survey in?	
		1 Gumbi Wajake
		2 Kalambaina Girafshi
Ward_shag *(required)*	What Ward are you completing this survey in?	
		1 Shagari
		2 Dandin Mahe

Consent_exp	Hello. My name is_____ from _____. I would like to invite you to take part in this survey about birth spacing in Nigeria sponsored by a local Nigerian family health organisation. If you take part this will help us better understand how we can improve access to family planning. The first part of this survey will check if you are eligible to participate in this survey which will take up to 10 minutes. The rest of the survey will take 20 minutes. Some of the questions in this survey are personal and may make you feel uncomfortable. You are free to skip a question and continue. The information you provided will be protected in a secure place and will not show your name. Any answers included in the final report will not have your name on it. If you choose not to take part in this survey, this will not affect your access to birth spacing services. You are free to change your mind at any time and stop taking part in the survey. Please let me know if you have any questions and I can answer these now.	
Consent *(required)*	Do you agree to do the survey? 'YES' means that you agree to do the survey 'NO' means that you will NOT do the survey.	1 Yes 0 No

If there is consent

What is your full name?

Name_ppt *(required)*

What is your age?

Age_ppt *(required)*

If there is consent > If within

the age group

How many children do you have?

children_pt *(required)*

When did you most recently give birth?

birth_date *(required)*

0 Less than 1 year ago
1 Less than two years ago
2 More than two years ago

When was the last time you menstruated?

mense_date *(required)*

1 Within the last month
2 Within the last 6 months
3 Over 6 months ago
4 Never
9 Prefer not to say
9

If there is consent > If within the age group > screenout mense

Are you currently pregnant?

Preg_now *(required)*

1 Yes
2 No
3 Don't Know

		9 Prefer not to say 9

If there is consent > If within the age group > screenoutmense > screenoutpregnancy		

FP_now *(required)*	Are you currently doing something or using any method to delay or avoid getting pregnant?	1 Yes 0 No

FPNO_conds *(required)*	Do any of the following apply to you?	1 Currently experiencing the menopause 2 Had a hysterectomy 3 Unable to fall pregnant/infertile 4 None of the above 9 9Prefer not to say 9

If there is consent > If within the age group > screenoutmense > screenoutpregnancy > screenout_conditions		

child_future *(required)*	Do you plan to have children in the future?	1 Yes 0 No

childnext_when *(required)*

How long would you like to wait from now before the birth of (a/another) child?

1 Immediately/now
2 Within the next year
3 Within the next 1-2 years
4 In over 2 years

If there is consent > If within the age group > screenoutmense > screenoutpregnancy > screenout_conditions > screenout_nextchild

Village *(required)*

Now we have finished the screening I would like to know a bit more about you. What village do you live in?

edu *(required)*

What is the highest level of education you have completed?

7 No formal education
0 No schooling
1 Some primary school (didn't finish)
2 Primary school
3 Some secondary school (didn't finish)
4 Secondary school
5 Some university (didn't finish)
6 University

 marital *(required)*	What is your marital status?	0 Married 1 Single 2 Divorced 3 Widowed 4 Prefer not to say
 work *(required)*	Some women work for a pay in cash or in kind like for food. Others sell things, have small businesses, or work family land or in family businesses. Are you currently doing any of these jobs?	1 Yes 0 No
 everFP *(required)*	Have you ever in your life done something or used any method to delay or avoid getting pregnant?	1 Yes 0 No
 Fpmethodever	What type(s) of birth spacing methods have you ever used? Select all that apply	0 Sayana Press 1 Injection/other injectable (e.g. Depoprovera, noristerat) 2 Implant 3 Pills 4 Interuterine device (IUD) 5 Condoms 6 Hysterectomy 7 Male sterilisation/vasectomy 8 Other non-modern method (e.g. herbs, timing method) 9 Prefer not to say 9

Fpnowmethod *(required)*	Earlier in the survey you said you were currently using birth spacing. What birth spacing method are you using right now?	0 Sayana Press 1 Injection/other injectable (e.g. Depoprovera, noristerat) 2 Implant 3 Pills 4 Interuterine device (IUD) 5 Condoms 6 Hysterectomy 7 Male sterilisation/vasectomy 8 Other non-modern method (e.g. herbs, timing method) 9 Prefer not to say 9
Where_FP *(required)*	Who or where did you get this method from?	0 Health centre/post/facility 1 Outreach nurse 2 Pharmacy/shop 3 Other (e.g. friends/family etc)
FP_break	Have you been able to use this method without pauses or breaks?	1 Yes 0 No

Why_no_FP *(required)*	Earlier in the survey you said you were not using birth spacing methods currently. Why are you not using birth spacing methods now?	0 I do not have access to birth spacing products. 1 Birth spacing products are too expensive 2 Side effects 3 My husband disapproves 4 My family other than my husband or community disapproves 6 Other
Advise_YN *(required)*	Have you ever received any advice or information on birth spacing?	1 Yes 0 No
Advice_where *(required)*	Who or where did you receive this advice or information from? Please select all that apply.	0 Health centre/ health facility 1 Outreach nurse/ CHW 2 Family member 3 Friend/neighbour 4 TV/radio 5 School/education facility 6 Religious or community leader 8 Private practitioner 7 Other
Advise_when *(required)*	When did you most recently receive advice or information on birth spacing?	0 Less than 1 month ago 1 1-2 months ago 2 3-6 months ago 3 7-12 months ago 4 More than a year ago

 Advice_result *(required)*	After receiving this advice did you make any changes related to birth spacing?	0 I made no changes 1 I started birth spacing methods 2 I changed birth spacing methods 3 I stopped birth spacing methods
 satisfaction_advice	How satisfied or dissatisfied were you with the quality of this birth spacing advice?	5 Very Satisfied 4 Satisfied 3 Neither satisfied or dissatisfied 2 Dissatisfied 1 Very dissatisfied
 Why_satisfaction	Please tell me more about why you were satisfied or dissatisfied with this advice?	
 Advice_no_why *(required)*	Why have you not received any advice or information on birth spacing?	0 There is no place/no one from who I can get this advice 1 I don't have time to get birth spacing advice 2 I am not interested in birth spacing advice 3 I already know about birth spacing 4 My husband disapproves of me getting advice 5 My family (other than my husband) or community disapprove of me getting this advice

	What is your level of interest in the following product:	
 **Interest_Laf** ***(required)***	**An injectable birth spacing method that you can use yourself in your home every 3 months delivered by a trained outreach nurse.**	**5 Very interested** **4 Interested** **3 Neutral** **2 Not interested** **1 Not at all interested**
 **GPS**	**Geo** ***This is for the enumerator only***	
End_no_consent	**Thank you for your time. These are all the questions we had for you today.** ***Please end the survey now.***	

Endline survey eval 2024

Field	Question	Answer
enumerator *(required)*	Please select the unique name for the enumerator field. (Edit this label to meet your needs...)	
Date_survey *(required)*	Date of survey	
LGA *(required)*	What LGA are you completing this survey in?	
		0 Shagari
		1 Wamako
Ward_wam *(required)*	What Ward are you completing this survey in?	
		1 Gumbi Wajake
		2 Kalambaina Girafshi
Ward_shag *(required)*	What Ward are you completing this survey in?	
		1 Shagari
		2 Dandin Mahe
Note_enumerator	NOTE TO ENUMERATOR: Please ensure before commencing the interview that the woman in the household you are speaking to is on the list of households from the baseline.	

Consent_exp	**Hello. My name is_____ from _____. I would like to invite you to take part in this survey about birth spacing in Nigeria sponsored by a local Nigerian family health organisation. If you take part this will help us better understand how we can improve access to family planning.** **The survey will take 10 minutes.** **Some of the questions in this survey are personal and may make you feel uncomfortable. You are free to skip a question and continue. The information you provided will be protected in a secure place and will not show your name. Any answers included in the final report will not have your name on it.** **If you choose not to take part in this survey, this will not affect your access to birth spacing services.** **You are free to change your mind at any time and stop taking part in the survey.** **Please let me know if you have any questions and I can answer these now.**	
Consent *(required)*	**Do you agree to do the survey? 'YES' means that you agree to do the survey 'NO' means that you will NOT do the survey.**	**1 Yes** **0 No**

If there is consent

	What is your full name?
Name_ppt *(required)*	
	What is your age?
Age_ppt *(required)*	
	What village do you live in?
Village *(required)*	
	How many children do you have?

children_ppt *(required)*		
FP_now *(required)*	Are you currently doing something or using any method to delay or avoid getting pregnant?	1 Yes 0 No
Preg_now *(required)*	Are you currently pregnant?	1 Yes 2 No 3 Don't Know 9 Prefer not to say 9
FP_ever *(required)*	Over the past year, before becoming pregnant, did you use any method to space births?	1 Yes 0 No
FP_ever_method *(required)*	What method(s) did you use?	0 Sayana Press 1 Injection/other injectable (e.g. Depo Provera, Noristerat) 2 Implant 3 Pills 4 Intrauterine device (IUD) 5 Condoms 6 Hysterectomy 7 Male sterilisation/vasectomy 8 Other non-modern method (e.g.

herbs, timing method)

9 Prefer not to say

9

Why did you stop using this method?

Why_no_FP_preg
(required)

7 I do not believe in birth spacing

3 My husband disapproves

4 My family other than my husband or community disapproves

0 I do not have access to birth spacing products

1 I cannot afford birth spacing products

2 Side effects

8 I want to be pregnant

9 Birth spacing method failed

6 Other

If there is consent > Not pregnant

If there is consent > Not pregnant > Modern FP

What birth spacing method are you using right now?

Fpnowmethod *(required)*

0 Sayana Press
1 Injection/other injectable (e.g. Depo Provera, Noristerat)
2 Implant
3 Pills
4 Intrauterine device (IUD)
5 Condoms
6 Hysterectomy
7 Male sterilisation/vasectomy
8 Other non-modern method (e.g. herbs, timing method)
9 Prefer not to say
9

Who or where did you get this method from?

Where_FP *(required)*

0 Health centre/post/facility
1 Outreach nurse
2 Pharmacy/shop
3 Other (e.g. friends/family etc)
4 Lafiya Sister

Have you been able to use this method without pauses or breaks?

FP_break

1 Yes
0 No

Why have you not been able to use this method consistently?

consistency
(required)

If there is consent > Not pregnant > Modern FP > Sayana

How many doses of Sayana Press have you received? This includes doses injected and taken home.

sayana_press
(required)

1	1
2	2
3	3
4	4
9	Don't know
9	

Did you self-inject Sayana Press?

selfinject
(required)

1	Yes
0	No

Why did you choose not to self inject?

not_inject
(required)

Do you plan to have children in the future?

child_future
(required)

1	Yes
0	No

How long would you like to wait from now before the birth of (a/another) child?

childnext_when
(required)

1	Immediately/now
2	Within the next year

		3 Within the next 1-2 years 4 In over 2 years
ever_this_year *(required)*	Have you used any birth spacing methods this past year? This includes if you started a method and then stopped.	1 Yes 0 No
Fpnowmethod_copy *(required)*	What birth spacing methods did you use?	0 Sayana Press 1 Injection/other injectable (e.g. Depo Provera, Noristerat) 2 Implant 3 Pills 4 Intrauterine device (IUD) 5 Condoms 6 Hysterectomy 7 Male sterilisation/vasectomy 8 Other non-modern method (e.g. herbs, timing method) 9 Prefer not to say 9

Why did you stop using this method?

Why_stop_FP
(required)

- 7 I do not believe in birth spacing
- 3 My husband disapproves
- 4 My family other than my husband or community disapproves
- 0 I do not have access to birth spacing products
- 1 I cannot afford birth spacing products
- 2 Side effects
- 8 I want to be pregnant
- 9 Birth spacing method failed
- 6 Other

Why did you choose to not use birth spacing methods?

why_no_fp
(required)

- 0 I do not have access to birth spacing products.
- 1 I cannot afford birth spacing products
- 2 Side effects
- 3 My husband disapproves
- 4 My family other than my husband or community disapproves
- 7 I do not believe in birth spacing
- 8 I want to be pregnant

		6 Other
Advise_YN *(required)*	In the past year have you received any advice or information on birth spacing?	1 Yes 0 No
Advise_when *(required)*	When did you most recently receive advice or information on birth spacing?	0 Less than 1 month ago 1 1-2 months ago 2 3-6 months ago 3 7-12 months ago 4 More than a year ago
Advice_where *(required)*	Who or where did you receive this advice or information from? Please select all that apply.	0 Health centre/ health facility 1 Outreach nurse/ CHW 9 Lafiya Sister 2 Family member 3 Friend/neighbour 4 TV/radio 5 School/education facility 6 Religious or community leader 8 Private practitioner 7 Other

Advice_result *(required)*	After receiving this advice did you make any changes related to birth spacing?	0 I made no changes 1 I started birth spacing methods 2 I changed birth spacing methods 3 I stopped birth spacing methods
satisfaction_advice	How satisfied or dissatisfied were you with the quality of this birth spacing advice?	5 Very Satisfied 4 Satisfied 3 Neither satisfied or dissatisfied 2 Dissatisfied 1 Very dissatisfied
Why_satisfaction	Please tell me more about why you were satisfied or dissatisfied with this advice?	
Advice_no_why *(required)*	Why have you not received any advice or information on birth spacing?	0 There is no place/no one from who I can get this advice 1 I don't have time to get birth spacing advice 2 I am not interested in birth spacing advice 3 I already know about birth spacing 4 My husband disapproves of

		me getting advice
		5 My family (other than my husband) or community disapprove of me getting this advice
heard_orgs *(required)*	Which, if any, of the following women's health organisations are you familiar with? Remember we want to know whether you have heard of these particular organisations and not just if you recognise the words that they are made from.	1 Samu Lafiya/ Lafiya Sister 2 Albishirin Ku Radio show 3 MSI 4 None of the above
work *(required)*	I will now ask you a couple of questions about you and your family. Some women work for a pay in cash or in kind like for food. Others sell things, have small businesses, or work family land or in family businesses. Are you currently doing any of these jobs?	1 Yes 0 No

Income_sufficiency *(required)*	Which of the following best describes your family's money situation?	1 We don't have enough money for food 2 We have enough money for food and clothes only 3 We have enough money for food and clothes and can save a bit, but not enough to buy expensive goods such as a TV set or a refrigerator 4 We can afford to buy certain expensive goods such as a TV or a refrigerator 9 Don't know/ 9 prefer not to say
GPS	Geo *This is for the enumerator only*	
End_no_consent	Thank you for your time. These are all the questions we had for you today. *Please end the survey now.*	

Appendix 2: Full results of qualitative coding

SP doses	Why did you choose not to self inject?	Fear	Lack of confidence in ability to SI	Preference for provider administration	Family / spouse provided injection	Interest in SI next time	Fear of discovery
3	I cannot do it		X				
1	I prefer to get it from a healthcare provider			X			
3	I am afraid of doing it by myself	X					
2	I am afraid	X					
3	I receive my dosage in a hospital			X			
1	I prefer to get it from a healthcare provider in a hospital			X			
2	I told her that I will visit her for the injection			X			
1	Because my husband does it for me				X		
1	Because I cannot do it		X				
1	I prefer to get it from a healthcare provider			X			
1	Because I cannot do it, but I think I will try it by myself next time		X			X	
1	Because I don't want to do it myself to avoid complication		X				
1	Because I received the injection at the hospital						
3	I told her that I will be visiting her for the injection			X			
4	I don't want my husband to know						X
2	I have a relative that is a healthcare provider at home				X		
3	Nothing						
2	I receive the dosage from a healthcare provider			X			
3	I am afraid of doing it by myself	X					
1	Because I can not do it		X				
1	The healthcare provider visit me to give the dose			X			
		3	**5**	**8**	**2**	**1**	**1**