



## RESEARCH ARTICLE

**REVISED** **How do fertility intentions lead to contraceptive continuation among a cohort of family planning users who received services from the private sector in Nigeria [version 2; peer review: 2 approved]**

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**Abstract**

**Background:** The Federal Ministry of Health of Nigeria is exploring task sharing family planning (FP) services to Community Pharmacists (CPs) and Patent and Proprietary Medicine Vendors (PPMVs). Yet few studies have explored contraceptive continuation of clients who received FP services from pharmacies and drug shops. This paper uses longitudinal data and looks at women's contraceptive continuation approximately nine months after they received FP services from CPs and PPMVs in Kaduna and Lagos states.

**Methods:** Longitudinal data for this analysis come from an evaluation of the IntegratE project. 491 women were interviewed within 10 days after receiving a FP service from an IntegratE CP or PPMV and approximately nine months later. The dependent variable is contraceptive continuation at the follow-up interview and the independent variable is fertility intentions as reported at enrollment. Multivariate logistic regression models were used to assess the association between fertility intentions and contraceptive continuation.

**Results:** 89% of women continued using contraception approximately 9 months after the enrollment interview. Women who intended to have a child in more than two years were significantly more likely to continue using contraception compared to women who intended to have a child within two-years (AOR 2.6; 95% CI 1.1-6.1). Among women who were asked about the quality of care received, 93% said the CP/PPMV asked whether they wanted to have a/another child in the future and 85% said they were asked when they would like to have that child.

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Any reports and responses or comments on the article can be found at the end of the article.

**Conclusion:** The fertility intentions of women who seek FP services from CPs and PPMVs in Nigeria can predict contraceptive continuation. As Nigeria task shares FP services to CPs and PPMVs, training on comprehensive FP counseling will be essential for scale-up. Since many women continued using FP, CPs and PPMVs have the potential to expand access to, and support women's continued use of, FP.

## Keywords

Family planning, fertility intentions, drug shops, pharmacies, task sharing, private sector, Nigeria

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**REVISED Amendments from Version 1**

Based on the thoughtful comments shared by the reviewers, we added details to clarify the methods used and to provide more nuance to the results within the context of existing literature. We also removed Figure 3 which was not directly related to the objective of the paper but the implementation of the project. Lastly, we have updated the author order to reflect Aparna Jain as second author. We welcome any additional feedback reviewers may have.

**Any further responses from the reviewers can be found at the end of the article**

**Introduction**

Contraception allows women and couples to plan for their families by spacing or limiting births. Avoiding unintended pregnancies also contributes to improvements in maternal and newborn health outcomes<sup>1</sup>. In Nigeria, about 15% of all women of reproductive age (15–49) have an unmet need for family planning (FP)- 10% for spacing and 5% for limiting pregnancies<sup>2</sup>. Yet as of 2018, 14% of women were using any method and 11% were using a modern contraceptive<sup>2</sup>. In addition to the barriers facing women in initiating contraception, discontinuation has been found to contribute to approximately one-third of unmet need globally<sup>3</sup>. About 41% of Nigerian women who begin using a contraceptive method discontinue that method within 12-months<sup>2</sup>. The main reasons Nigerian women reported discontinuing their method include desire to become pregnant, side effects/health concerns and infrequent sex<sup>2</sup>.

Previous studies have documented factors associated with contraceptive discontinuation while in need (i.e. wanting to delay or prevent pregnancy). Method-related factors include experience of side effects<sup>4–8</sup>, the type of method selected (for example, short-acting versus long-acting or hormonal versus nonhormonal methods)<sup>5,9,10</sup>, and women's satisfaction with the method<sup>11</sup>. Experience of side effects is the most commonly cited reason for method discontinuation while in need<sup>4–8,11</sup>, although some studies have found that the effect of side effects on discontinuation may be overestimated<sup>9,12,13</sup>.

Individuals' characteristics, intimate relationships, and social factors can also influence whether a woman continues to use her method. Non-method related factors associated with contraceptive continuation include: a previous unintended pregnancy, partner support, age, number of desired children, number of living children, number of male children, being in school or working, and discussing FP with a friend<sup>8,9,11,13</sup>. Studies have also shown that a woman's motivation to prevent pregnancy and intent to use contraception are associated with method selection<sup>14</sup> and contraceptive continuation<sup>9,15</sup>.

Fertility intentions, that is the desire for a certain number of children and the intended timing of a first birth and subsequent spacing between births<sup>16</sup>, are also associated with contraceptive continuation. A longitudinal study in Indonesia found that women who wanted to wait at least two years before their next pregnancy were more likely to continue using a modern

contraceptive than those who wanted a birth within two years<sup>17</sup>. Fertility intentions also play important roles in women's decision to use contraception and can predict birth outcomes<sup>16,18</sup>. For example, a study in Senegal demonstrated that women who did not want additional children were less likely to become pregnant, especially if they were also using a modern method<sup>18</sup>. Previous studies have found that factors including age, parity, perception of a partner's desire for additional children, pregnancy attitudes, and a previous negative birth experience are associated with women's fertility intentions<sup>16,19,20</sup>. Yet for most women, fertility intentions often fluctuate and can even change within a short period of time<sup>18,19,21</sup>. For example, Jones *et al.* found that while 39% of women who were interviewed three times over the course of a year reported being uncertain if they wanted more children, only 9% consistently reported uncertainty at all three interviews. In longitudinal study in India, among women who reported wanting a child in two or more years during an enrollment interview, only 5% of those women consistently reported that preference during subsequent follow-up interviews within a 12-month period<sup>21</sup>. Similarly, 14% of those who reported wanting children within two years did so consistently during follow-up interviews<sup>21</sup>.

Given that fertility intentions can influence contraceptive use and continuation, and often fluctuate, researchers have highlighted the importance of discussing fertility intentions during FP counseling and general healthcare visits<sup>17,19,21–23</sup>. Quality counseling, in itself, has been shown to improve uptake and continuation of FP. For example, higher levels of quality of care received during FP counseling was significantly associated with contraceptive continuation in a study conducted in Indonesia<sup>17</sup> and in India<sup>22</sup>. Jain *et al.* found that the method selection domain of quality of care, which includes two items related to the provider's conversation around their client's fertility intentions, was significantly associated with contraceptive continuation three months later<sup>22</sup>.

To date, few studies have explored contraceptive continuation of clients who received FP services from private sector pharmacies and drug shops. This paper uses longitudinal data from Nigeria and looks women's contraceptive continuation approximately nine months after they received FP services from private sector Community Pharmacists (CPs) and Patent and Proprietary Medicine Vendors (PPMVs) in Kaduna and Lagos states. Specifically, this paper aimed to assess the fertility intentions of women seeking services from CPs and PPMVs and whether their fertility intentions lead to continued contraceptive use nine months later.

**Expanding family planning access in Nigeria through the private sector, the IntegratE Project**

As part of their strategy to expand access to FP in Nigeria, the Federal Ministry of Health is exploring task sharing certain FP services to CPs and PPMVs. Task sharing involves delegating or distributing specific tasks among healthcare teams and, where appropriate, from high-skilled health care workers to those with fewer qualifications<sup>24</sup>. Task sharing within public sector

is common, especially the provision of oral and injectable contraceptive by community health workers<sup>25,26</sup>. Task sharing FP to private sector pharmacies and drug shops, however, has been limited in many countries despite being identified a promising high impact practice to expand access to FP<sup>27</sup> and that drug shop owners generally similar education qualifications as community health workers and pharmacists hold higher education degrees<sup>28</sup>.

In Nigeria, while CPs and PPMVs are not formally recognized as FP service providers, they are important sources for primary health care<sup>29,30</sup> and for FP: 22% of modern contraceptive users' report receiving their last method from a PPMV and 12% from a private pharmacy<sup>2</sup>. PPMVs are not required to receive a standard training or a degree for licensure and are currently authorized to provide over the counter medications only<sup>30,31</sup>. To become a CP, you must complete a five-year degree in Pharmacy by a university recognized by the Pharmacists Council of Nigeria.

Previous studies have shown that while many PPMVs provide FP services, that they do not have the required knowledge to provide FP services such as oral and injectable contraceptives<sup>32,33</sup>. One study found that knowledge to provide injectable contraceptives increased with training however<sup>34,35</sup> and other studies have found clients are generally satisfied with the FP services received from these providers<sup>32,34</sup>.

In collaboration with the Federal Ministry of Health, IntegratE, a four-year project (2017–2021), is piloting a three-tiered accreditation system. This system seeks to stratify PPMVs in accordance with their prior health training. Those without health qualifications are categorized as Tier one, those with qualifications in Nursing and Midwifery, Community Health Extension and Community Health Officers are categorized as Tier two and those with pharmacy technician's certificate are categorized as Tier three. Under the pilot accreditation system, Tier one PPMVs participated in a three-day training on FP counseling, provision of condoms, cycle beads and oral contraceptive refills, referrals for all other FP methods, and documenting FP services. Tier two and Tier three PPMVs received the same training as Tier one PPMVs plus an additional three-day training on injectable administration, and implant insertion and removal. As CPs already participate in a formal pharmacy program, they function outside of the pilot accreditation system but received the same training as Tier two and Tier three PPMVs.

Between July 2018 and September 2019, 894 CPs and PPMVs enrolled in the project and were trained in FP based on their tier. All trainings were classroom-based and then CPs, Tier two and Tier three PPMVs also participated in clinical sessions at nearby public health facilities. During the clinical sessions, they were required to competently complete 12 implant insertions and three removals before providing these services at their businesses. The IntegratE project and state teams (Pharmacy Council of Nigeria, National Association of Patent and Proprietary Medicine Dealers, State Ministry of Health and State Primary Health Care Development Agency)

provided supportive supervision approximately three months after the training.

### Study sites

As of 2020, the IntegratE project is implemented in Lagos and Kaduna. Lagos state, with a population of 9,013,534, is in the southern part of Nigeria while Kaduna state, with population of 6,113,503, is in northern part of the country<sup>36</sup>. According to the 2018 Nigeria Demographic and Health Survey, the total fertility rate is relatively low in Lagos state (3.4 births per woman) compared to Kaduna state (5.9 births per woman). In terms of fertility intentions, 23% of women interviewed in Lagos state reported desiring no additional children, 10% were unsure, and 66% wanted additional children (18% within two years, 14% in more than two years, and 34% were unsure of the timing)<sup>2</sup>. In Kaduna, 18% of women reported desiring no additional children, 80% wanted additional children (37% within two years, 23% in more than two years, and 20% were unsure of the timing)<sup>2</sup>. Less than 1% of women in Kaduna were unsure whether or not they wanted additional children<sup>2</sup>. The modern contraceptive prevalence rate among married women of reproductive age varies across the two states from 29% in Lagos to 14% percent in Kaduna<sup>2</sup>. About 33% of women in Lagos and 34% in Kaduna who begin using a contraceptive method discontinue that method within 12-months<sup>2</sup>.

## Methods

### Data source

Longitudinal data used for this analysis come from an on-going evaluation of the IntegratE project (2018–2021). The IntegratE project is funded by the Bill & Melinda Gates Foundation and MSD for Mothers. As part of this evaluation, women who received FP services (counseling, referral, condoms, and/or oral, injectable and implant contraceptives) from an IntegratE-trained CP or PPMV were interviewed over the phone within 10 days after receiving the service and approximately nine months later. Women were interviewed within 10 days of their visit to reduce recall bias related to women's experiences with the services received from the CP and PPMV. Verbal informed consent was received before the beginning enrollment and follow-up interview. Written consent was not obtained as interviews were conducted over the phone. The research protocol, including informed consent procedures, received ethical approval from the Population Council's Institutional Review Board (Protocol 878) and Nigeria's National Health Research Ethic Committee.

From June to November 2019, IntegratE CPs and PPMVs in Kaduna and Lagos states provided female FP clients between the ages of 16–49 with basic information about the study and requested their permission to collect and share their contact details with the interviewers part of the research team. All interviewers participated in a training on research ethics, the study's design and objectives, procedures for implementing informed consent forms, and conducting telephone interviews. Interviewers called clients who agreed to share their information

with the research team to confirm their eligibility. Eligible respondents were between 16–49 (women 16–17 had to be married to be considered an emancipated minor), received a FP service from a trained CP or PPMV, and owned their own cell phone. Respondents could be continuing FP users, method switchers, or new to FP altogether. If eligible, trained data collectors provided potential respondents with details of the study including the objectives, what was expected of them as a respondent, and potential risks and benefits to participating. Those who agreed were interviewed over the phone and compensated 500 Naira (Approximately 1.39 USD) in phone credit. Interviewers also requested to re-contact participants.

Interviewers used tablets to administer a quantitative client enrollment interview that included questions on socio-demographic characteristics, current and previous contraceptive use, quality of care received, and general perceptions on their experiences receiving services from the CP or PPMV. The same respondents were interviewed by phone approximately 8–11 months after that initial interview and were asked questions related to their current contraceptive use, experience of side effects, continued use of FP services from CPs and PPMVs, and COVID-19. A total of 596 women were interviewed at an enrollment and 517 at 9–11 months later, (13% lost to follow-up).

#### Dependent variable

The dependent variable is contraceptive continuation at the follow-up interview. Respondents who received a method or referral from a IntegratE CP or PPMV were asked if they were currently using the same, different, or no method to avoid or delay pregnancy. We dichotomized the dependent variable where respondents who reported using the same method and or those who switched to a different FP method are considered FP continuers and coded as one. This includes methods they purchased directly from the CP or PPMV or received because of a referral. Respondents who stopped using FP altogether are considered discontinuers and coded as 0.

#### Independent variable

The main independent variable is fertility intentions as reported at enrollment. A categorical variable was created from two questions: “*do you want to have any (more) children*” and those who said yes were then asked, “*when would you like to have your first/next child.*” The independent variable is coded as follows: 1= respondents who reported they want a child within the 2 years of the interview; 2= respondents who reported they want a child two years or more from the interview; 3= respondents who want a child but do not know when; and 4= respondents who do not want any/more children.

Additional covariates explored and included in the multivariate model include age, education, marital status, number of living children, employment status, past contraceptive use, experience of side effects at follow-up and state. Ten observations were missing from the question “*what is the highest level of education that you have attained.*” For the education variable, missing observations included in the category for did not

achieve a secondary education or higher/did not respond. For experience of side effects, we created a categorical variable. At follow-up, contraceptive users of the pill, injectable or implant were asked if they were currently experiencing side effects, and if they responded No, they were then asked if they had experience side effects since the enrollment interview. Those who responded Yes to currently experiencing side effects or experience of side effects since enrollment were coded as 1 and those who said No were coded as 0. Those who did not respond or were skipped from this question because they were using another method (for example, cycle beads or condoms) were coded as 2 No Response. All women who discontinued their method were also asked whether they experience side effects as a result of their method. Those who said Yes were coded as 1, those who said No were coded as 0 and anyone who did not responded were coded as 2.

#### Data analysis

The analytical sample was limited to respondents who were interviewed at enrollment and follow-up, were 16–49 years of age, and either who began to use or continued to use a FP method as a result of their visit to a CP or PPMV (n=491). Respondents who were pregnant at the time of the follow-up interview (n=17), those who were 50 or older (n=5), those who did not receive a method from a CP/PPMV or their referral (n=3), and who did not answer the fertility intentions questions (n=1) were excluded. Descriptive statistics were calculated for respondent characteristics, FP use, fertility intentions at enrollment, and experience of side effects as reported at follow-up. Multivariate models that accounted for the longitudinal nature of the data were conducted but the likelihood ratio test showed that most of variance in the random intercept was accounted for by the covariates. Multivariate logistic regression models were used to assess the association between fertility intentions and contraceptive continuation. Descriptive statistics were also calculated for two quality of care indicators related to fertility intentions among those who were asked about the quality of care received.

We conducted three sensitivity analyses. First, we conducted Pearson chi2 tests to compare respondent characteristics of all women interviewed at enrollment versus those included in the analytical sample and there were no significant differences between the two samples in the characteristics reported. We then ran the multivariate logistic regression model including pregnant women in the sample, and then with women age 16–53. The results were similar to the final model in both sensitivity analyses. The analyses were conducted in STATA.SE, Version 16.

#### Results

**Table 1** presents the demographic profile of women who received FP services from CPs and PPMVs at the enrollment interview. Just under half of the women were 25–34 years of age (47%). Many (75%) had attained at least a secondary education and 72% were employed at the time of the enrollment interview. Most women were married (95%) and had two or more living children (86%). A little over half (56%) had previously used FP in the past and expressed a desire for a/additional

**Table 1. Respondent characteristics at enrollment, and experience of side effects and contraceptive continuation and at follow-up (n=491).**

	%
<b>Age</b>	
16–24	13.9
25–34	46.8
35–49	39.3
<b>Education</b>	
Did not complete a secondary school education/no response	25.3
Completed secondary education or higher degree	75.7
<b>Currently employed</b>	
Yes	72.3
No	27.7
<b>Marital status</b>	
Never married/single	4.3
Married/in-union	94.7
Separated/widowed	1.0
<b>Number of living children</b>	
None	3.5
1	10.6
2	18.7
3	28.1
4+	39.1
<b>Has used FP in the past</b>	
Yes	55.6
No	44.4
<b>Fertility intentions</b>	
Wants a child within 2 years	17.5
Wants a child in 2 or more years	34.6
Wants a child, don't know when	3.7
Does not want (more) children	44.2
<b>Experienced of side effects as reported at follow-up</b>	
Yes	33.0
No	62.7
Did not say	4.3
<b>Continued using contraception at follow-up</b>	
Yes	89.4
No	10.6
<b>State</b>	
Kaduna	50.1
Lagos	49.9

children (56%): 18% wanted a child within the next two years, 35% wanted a child in two or more years and 4% were unsure of the timing. Half of the women were from Kaduna and half from Lagos. At follow-up, one-third (33%) reported experiencing side effects and approximately 89% of women continued to use contraception (82% reported using the same method and 7% reported switching to another method, data not shown).

Figure 1 shows the distribution of current method use as reported at the enrollment interview. Two-fifths (40%) of women were using the injectable, 33% were using an implant and 24% were using the pill. Two percent reported using another method such as condoms, cycle beads, and or an IUD (as a results of a referral).

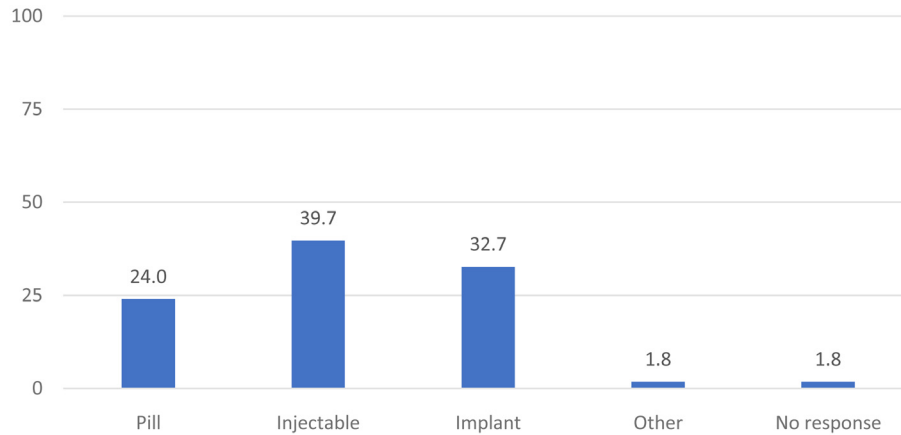
Figure 2 shows the distribution of continuers and discontinuers at follow-up by their fertility intentions as reported at enrollment. Among women who wanted to have a child within two years, 81% continued using contraception approximately nine months later compared to 93% of women who reported wanting a child in more than two years and 91% of women who did not want any more children. About 78% of women who were unsure when they wanted their next child continued using their contraceptive method approximately nine months later.

Unadjusted and adjusted odds ratios of contraceptive continuation are presented in Table 2. Women who wanted their next child more than two years after enrollment were three times more likely to continue using contraception compared to those who wanted a child within two years (OR=3.0; 95% CI 1.4-6.7). Women who did not want any/more children were two times more likely to continue using contraception compared to those who wanted a child within two years (OR=2.3; 95% CI 1.1-4.6). When accounting for covariates in the multivariate model, women who intended to have a child in more than two years remained significantly more likely to continue using contraception compared to women who intended to have a child within two-years, although the odds ratio decreased slightly (AOR 2.6; 95% CI 1.1-6.1). Not wanting any/more children was no longer significant in the multivariate model but the OR remained in the expected direction.

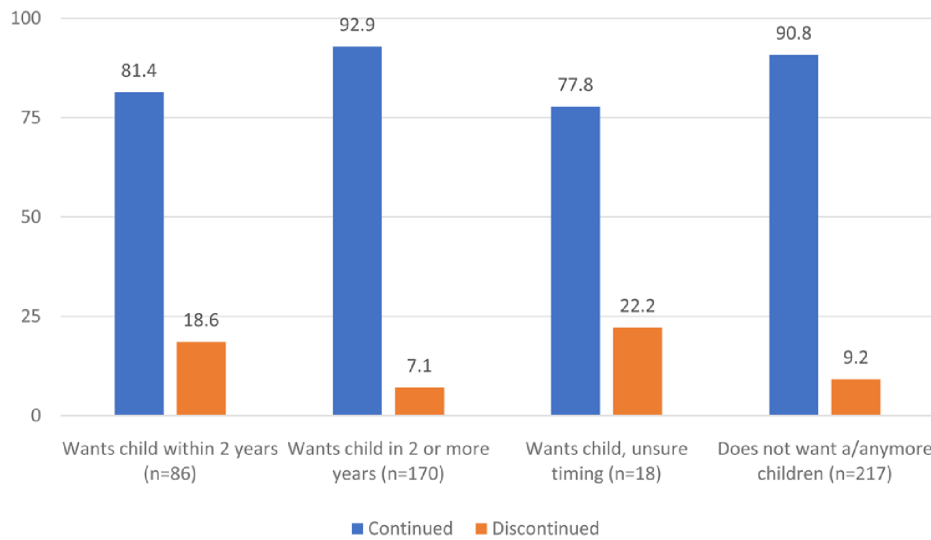
Women who had no children were 80% less likely to be using contraception compared to women with 4 or more child (OR 0.20; 95% CI 0.06-0.65) and this association remained significant in the multivariate model (AOR 0.16; 95% CI 0.03-0.97). Women who reported that they did not experience side effects at follow-up were two times more likely to be using contraception compared to women who did in both the univariate model (OR 2.1; 95% CI 1.2-4.0) and multivariate model (AOR 2.1; 95% CI 1.1-4.0).

## Discussion

Results from this analysis suggest that among women who received services from CPs and PPMVs in Nigeria, fertility intentions are associated with their contraceptive continuation. Specifically, the respondents in this study were more likely



**Figure 1.** Distribution of current method use as reported at enrollment (N=491).



**Figure 2.** Distribution of continuers and discontinuers at follow-up by their fertility intentions as reported at enrollment (N=491).

to continue using contraception if they reported wanting a child in two or more years compared to women who wanted a child within two years. These results are consistent with previous studies that have found associations between fertility intentions and contraceptive use and continuation<sup>17,37,38</sup>. We also found that experience side effects and number of living children were also associated with contraceptive continuation for the women in this study, consistent with existing literature<sup>4–8,11,20</sup>.

The contraceptive users in this study were similar in age to contraceptive users broadly in Nigeria, although were slightly more educated: 75% of women in this study completed at least a secondary education compared to 60% nationally<sup>2</sup>. As FP services are task shared to CPs and PPMVs, the results from this study underscore the importance of discussing fertility intentions during FP counseling between CPs/PPMVs and

their clients in order to help women choose a method that best suits their needs and to continue using FP. As fertility intentions change over time<sup>15,19</sup>, and stronger or more precise fertility intentions have been shown to be associated with the actualization of those intentions<sup>39</sup>, CPs and PPMVs should also discuss fertility intentions with their clients often, consistent with recommendations from studies in Sweden<sup>23</sup>, and the U.S.<sup>19</sup>.

The association between fertility intentions and continuation remained significant even when accounting for experience of side effects. This suggests that understanding a woman’s fertility intentions, in addition to providing information about side effects, is essential for comprehensive FP counseling and quality of care<sup>17,22</sup>. Many of the women in this study who were asked about the quality of care received from the CP or PPMV that they saw reported that the CP or PPMV asked about their fertility intentions (93% said they were asked whether

**Table 2. Univariate and multivariate logistic regression models of fertility intentions on contraceptive continuation among women who received family planning services from Community Pharmacists and Patent and Proprietary Medicine Vendors (n=491).**

	Univariate Model		Multivariate Model	
	OR	95% CI	OR	95% CI
<b>Fertility intentions</b>				
Want a child within 2 years from now	ref	-	ref	-
Want a child 2 or more years from now	3.00**	1.35-6.70	3.00**	1.35-6.70
Want a/another child but don't know when	0.64	0.20-2.03	0.64	0.20-2.03
Do not want a/ additional children	2.25*	1.11-4.59	2.25*	1.11-4.59
<b>Age</b>				
16-24	ref	-	ref	-
25-34	0.95	0.39-2.29	0.95	0.39-2.29
35-49	0.94	0.38-2.32	0.94	0.38-2.32
<b>Education</b>				
Did not complete a secondary school education/no response	ref	-	ref	-
Completed secondary education or higher degree	0.59	0.28-1.25	0.59	0.28-1.25
<b>Currently employed</b>				
Yes	1.04	0.55-1.95	1.04	0.55-1.95
No	ref	-	ref	-
<b>Marital status</b>				
Never married/single	ref	-	ref	-
Married/in-union	1.42	0.40-5.00	1.42	0.40-5.00
Separated/widowed	0.67	0.54-8.20	0.67	0.54-8.20
<b>Number of living children</b>				
None	0.20**	0.06-0.65	0.20**	0.06-0.65
1	0.56	0.21-1.45	0.56	0.21-1.45
2	0.56	0.25-1.26	0.56	0.25-1.26
3	0.75	0.35-1.61	0.75	0.35-1.61
4+	ref	-	ref	-
<b>Have ever used family planning</b>				
Yes	1.14	0.64-2.01	1.14	0.64-2.01
No	ref	-	ref	-
<b>Experience of side effects</b>				
Yes	ref	-	ref	-
No	2.14*	1.15-3.96	2.14*	1.15-3.96
Did not respond	0.27**	0.10-0.71	0.27**	0.10-0.71
<b>State</b>				
Lagos	ref	-	ref	-
Kaduna	1.59	0.89-2.83	1.59	0.89-2.83

\* p-value  $\geq$  0.05; \*\* p-value  $\geq$  0.01



they wanted to have a or another child in the future and 85% were asked when they would like to have a or another child, data not shown). This suggests that when CPs and PPMVs are trained in FP counseling, they can provide quality counseling and facilitate a dialogue around fertility intentions with their clients, despite the additional time it may take to discuss fertility intentions with their clients. As the method selection domain of quality of care has also been shown to be significantly associated with continuation<sup>22</sup>, emphasizing the importance of comprehensive FP counseling when task sharing FP service provision to CPs and PPMVs will be essential. Understanding other aspects in a woman's life, such as number of living children, will also be important for these new FP providers in aiding their clients in choosing an appropriate method. It is important to note, however, that many women chose CPs and PPMVs for the perceived discretion and privacy<sup>29,34</sup>. Ensuring women are comfortable discussing these issues with these private sector outlets, is also an important consideration.

Another important finding from this study is that 89% of women in need who received a FP method as a result of a visit from CPs and PPMVs continued to use their method about nine months later. These results suggest that when CPs and PPMVs are properly trained, they have potential to support their clients who wish to continue using contraception, even as about two-thirds of the women interviewed were using short acting methods such as the pill, injectable, or condom. Previous studies have documented proximity and flexible operating hours as reasons why women prefer PPMVs for FP and other primary health care services<sup>40,41</sup>. Therefore, the accessibility of CPs and PPMVs may also facilitate women's continued use FP.

### Limitations

Data for this analysis came from a specific population. All women interviewed sought FP services from the private sector and therefore the results are not representative of the broader population of Nigerian women of reproductive age. The women in this study may also have been more motivated to use contraception since they sought FP services. Our results, however, are consistent with other studies that have found an association between fertility intentions and contraceptive continuation. The results from this study, therefore, add a unique perspective of women who seek services from private sector pharmacies and drug shops.

Another limitation is that respondents had to own a phone to be eligible to participate, which may have introduced a potential source of selection bias. This criterion was included to reduce the proportion of respondents lost to follow-up since we used phone interviews.

### Conclusion

The fertility intentions of women who seek FP services from private sector pharmacies and drug shops (PPMVs) in Nigeria

can predict contraceptive continuation. With training, CPs and PPMVs can discuss fertility intentions with their clients and many women who seek services from these providers continue using FP, even short acting methods like the pill or injectable. As task sharing FP services to these private sector cadres is scaled in Nigeria and in similar settings, supporting CPs and PPMVs to provide comprehensive FP counseling, emphasizing the importance of discussing fertility intentions with women often, will be essential.

### Data availability

#### Underlying data

Harvard Dataverse. How do fertility intentions lead to contraceptive continuation among a cohort of family planning users who received services from the private sector in Nigeria. The dataset analyzed during the current study will be available on the Population Council's site: <https://dataverse.harvard.edu/dataset/popcouncil> in January 2022 as data for this paper came from a larger evaluation and data collection is ongoing. They will also be available from the corresponding author on reasonable request.

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### Author's contributions

SCD managed the overall preparation of the manuscript including conceptualizing and drafting the manuscript and conducting the analysis and contributed the development of the overall study's methodology. SB supervised the implementation of the research activities and contributed to drafting the manuscript. EO led the funding acquisition for the Integrate project, including the study, and reviewed drafts of the manuscript. UO and DBO managed the coordination of data collection and data management. AJ was the principal investigator and led the development of the overall study's methodology, and also guided the conceptualization of the manuscript and analysis. All authors have read and approved this version of the manuscript.

### Acknowledgements

The study was conducted in collaboration with the Federal Ministry of Health of Nigeria, Pharmacists Council of Nigeria, National Association of Patent and Proprietary Medicine Dealers, State Ministries of Health in Kaduna and Lagos and the IntegratE consortium partners Society for Family Health, Marie Stopes International, Planned Parenthood Federation of Nigeria, and PharmAccess. We thank Rodio Diallo at the Bill & Melinda Gates Foundation who reviewed this manuscript. The successful completion of these studies would not have been possible without the dedication of the research team and data collectors. We further acknowledge all the women who volunteered their time and provided valuable information during this study.

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## Open Peer Review

Current Peer Review Status:  

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### Version 2

Reviewer Report 09 May 2022

<https://doi.org/10.21956/gatesopenres.14897.r32036>

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**Jill Peterson** 

FHI 360, Washington, DC, USA

Thank you for addressing the previous comments. Two final comments from me:

1. There is a typo in the new sentence in the discussion related to age and education - "The contraceptive users in this study were similar in age to contraceptive users broadly in Nigeria, although **were slightly more education:..**" - should be "were slightly more educated", or "had slightly more education".
2. It would be important to note which results were not statistically significant and therefore removed from the model. You could then say that those variables were then analyzed descriptively.

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Family planning continuation, pharmacy provision of family planning, family planning service denial/turnaway

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

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### Version 1

Reviewer Report 23 November 2021

<https://doi.org/10.21956/gatesopenres.14488.r31323>

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**Jill Peterson** 

FHI 360, Washington, DC, USA

This is a very interesting and important article looking at the ability of Community Pharmacists and Patent Proprietary Medicine Vendors in two states of Nigeria to provide FP that meets the needs of those seeking it. Specifically, the research examines whether the fertility intentions of women in the sample can predict contraceptive continuation.

Specific comments:

- It would be helpful to mention who funds the IntegratE project.
- A table presenting the information found in the study sites would help guide the reader through all the data. You could then add a bit of information about demographic similarities/differences of the two states, including information about religion, wealth quintile, etc., to help readers who are unfamiliar with Nigeria. As I read further, your sample seems highly educational and with high employment rates. Does your sample reflect the employment and educational averages for the states, or is this a factor of where they sought their FP?
- Why no mention of the finding of those who did not report on side effects as being less likely to be using contraception at follow-up?
- Are you missing an "and" after (Protocol 878)?
- I'm confused about Figure 3. It seems like it should come higher up in the results. I'm also confused about an n of 411 in Figure 3 (the number asked about their fertility intentions), but when you break down fertility intentions by continuation in figure 2, you have a higher n (n=491). Is the difference being asked fertility intentions by the data collector vs. the provider (CP or PPMV)? If so, that could be made more clear to the reader. Is it being used as a proxy for quality of care? Were other proxy indicators for quality of care collected, such as counseling on side effects?
- I'm also confused as to why having been asked about their fertility intentions by the provider was not included as an independent variable. In the discussion you highlight the importance of discussing fertility intentions during counseling, but this is not a variable I see listed in your analysis. The same is true of providing information about side effects. I don't see this variable in your model, but you mention its importance in the discussion.

I recommend clarification on the last two points to ensure that the discussion and conclusions flow from the results.

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

I cannot comment. A qualified statistician is required.

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Partly

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Family planning continuation, pharmacy provision of family planning, family planning service denial/turnaway

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Author Response 24 Apr 2022

**Sara Chace Dwyer**, Population Council, Washington DC, USA

Specific comments:

- It would be helpful to mention who funds the IntegratE project.
  - **Response:** Funding was added on page 6.
- A table presenting the information found in the study sites would help guide the reader through all the data. You could then add a bit of information about demographic similarities/differences of the two states, including information about religion, wealth quintile, etc., to help readers who are unfamiliar with Nigeria. As I read further, your sample seems highly educational and with high employment rates. Does your sample reflect the employment and educational averages for the states, or is this a factor of where they sought their FP?
  - **Response:** As the data come from two different sources, we presented the data in the paragraph for simplicity. We added a sentence to in Discussion section to highlight that our sample was similar in age to contraceptive users broadly, while our sample was slightly more educated.
- Why no mention of the finding of those who did not report on side effects as being less likely to be using contraception at follow-up?
  - **Response:** This finding is presented the Results on page 13 and in the Discussion on page 14.
- Are you missing an "and" after (Protocol 878)?
  - **Response:** We added accordingly.
- I'm confused about Figure 3. It seems like it should come higher up in the results. I'm

also confused about an n of 411 in Figure 3 (the number asked about their fertility intentions), but when you break down fertility intentions by continuation in figure 2, you have a higher n (n=491). Is the difference being asked fertility intentions by the data collector vs. the provider (CP or PPMV)? If so, that could be made clearer to the reader. Is it being used as a proxy for quality of care? Were other proxy indicators for quality of care collected, such as counseling on side effects?

- **Response:** We agree and removed Figure 3 from the results. We did add the proportions to the discussion on page 14 to highlight that providers in this study did ask about women's fertility intentions, which is promising given the findings of this study.
- I'm also confused as to why having been asked about their fertility intentions by the provider was not included as an independent variable. In the discussion you highlight the importance of discussing fertility intentions during counseling, but this is not a variable I see listed in your analysis. The same is true of providing information about side effects. I don't see this variable in your model, but you mention its importance in the discussion.
  - **Response:** We included the quality-of-care questions related to provider discussion around fertility intentions and side, but these results were not statistically significant and therefore removed from the model. As other papers have found a link between counseling and continuation, we added these results descriptively demonstrate CPs and PPMVs are a potential access point for counseling and contraceptive use.

**Competing Interests:** No competing interests were disclosed.

Reviewer Report 22 November 2021

<https://doi.org/10.21956/gatesopenres.14488.r31328>

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**Julie Hernandez** 

Department of International Health and Sustainable Development, School of Public Health and Tropical Medicine, Tulane University, New Orleans, LA, USA

This manuscript focuses on an important component of family planning strategies by assessing the role of providers, and specifically private sector providers, in method continuation. With discontinuation being a large contributor to unmet need worldwide, identifying individual and environmental factors that could limit its incidence among FP users is crucial to effective contraceptive programming.

Overall, this paper is of high quality. The study justification is comprehensive, and variables of interest are clearly introduced. The study context is clearly presented and details the relevance of private sector providers (often overlooked in FP service delivery strategies). Data analysis and results are sound and rigorously explained.

The main issue the reviewer would like to raise is the risk of stretching the results regarding the importance of private sector providers. While it is well-documented that they are preferred sources of contraceptives in many Sub-Saharan African countries, the study design, in the absence of a control group, does not allow to compare continuation rates for women who received their method from a CP/PPMV vs another service delivery provider.

Some sentences in the manuscript should thus be nuanced, e.g.:

- (Results): *"These results suggest that when CPs and PPMVs are properly trained, many of their clients continue to use contraception"*. In the absence of a control group, this statement goes beyond what the study design can demonstrate.
- (Limitations): *"The results from this study, therefore, add a unique perspective of women who seek services from private sector pharmacies and drug shops."*

Furthermore, experiments conducted in other countries to strengthen the role of private sector outlets suggested that increased training and role in FP counselling came at several costs: on the SDP's side, the additional counselling adds to the workload of the providers who may be reluctant to engage in more than business/sales transactions. On the client side, women indeed value private outlets for their "proximity and flexible hours" (as mentioned in the manuscript) but also for their discretion and the capacity to conduct a rapid and inconspicuous business exchange. Being asked additional (intimate) questions about fertility intention might decrease their intention to frequent these outlets.

A mention of those limitations and a more nuanced consideration of the possible roles of private sector providers, considering existing evidence, would be welcome in the Discussion section of the manuscript.

The key main point, that fertility intentions are the main determinant of contraceptive use and continuation, remains valid and extremely important to the field.

#### **Minor improvements:**

- Methods: – Since the CPs and PPMVs were in charge of initially recruiting participants, how did you ensure the absence of bias in who the providers approached/ignored to participate in the study (e.g. skewed towards more educated, older, "most likely to continue" participants?).
- This may go beyond the scope of this manuscript but recent research on the role of side-effects in method discontinuation suggests that binary variables ("Did you experience side effects? Yes / No) are insufficient to grasp the influence of these side-effects in method (dis-)continuation. More specific questions on the intensity, length and "bearable" nature of those side-effects are much more effective predictors of future contraceptive behaviors.
- In Data Analysis, clarify *"were using FP because of their visit to a CP or PPMV", makes it sound*

*too restrictive, earlier in the Methods it sounds like women who initiated FP anywhere but continued resupplying their methods at a participating CP / PPMV could be recruited in the study as well?*

#### Results:

- In the sample description (socio-demographic characteristics), it would be interesting to comment on study participants' profile compared to average contraceptive users/women with unmet need in Nigeria (based on DHS or PMA survey)? This would also help addressing the question of possible recruitment bias raised above.
- Figures 1 and 2 might be unnecessary? Results could be presented in a table or simple paragraph.
- Nuance "Only 74% of women who were unsure..." as this group represents only 3.7% of the sample, the validity of the findings must be nuanced.
- Clarify the sentence: "As stronger or more precise fertility intentions have been shown to be associated with the actualization of those intentions and that fertility intentions changed over time." There seem to be two separate statements and/or a fragment of the sentence is missing?
- Considering that a large share of women (almost a third) used implants, which are more difficult to "discontinue" (they require visit to health facilities and payment off fees at a minimum), the authors could have included sub-analysis of continuation patterns based on method used at baseline.

#### **Is the work clearly and accurately presented and does it cite the current literature?**

Yes

#### **Is the study design appropriate and is the work technically sound?**

Yes

#### **Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

#### **If applicable, is the statistical analysis and its interpretation appropriate?**

Yes

#### **Are all the source data underlying the results available to ensure full reproducibility?**

Yes

#### **Are the conclusions drawn adequately supported by the results?**

Partly

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** International family planning, Democratic Republic of Congo



**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Author Response 24 Apr 2022

**Sara Chace Dwyer**, Population Council, Washington DC, USA

A mention of those limitations and a more nuanced consideration of the possible roles of private sector providers, considering existing evidence, would be welcome in the Discussion section of the manuscript.

- **Response:** We thank the reviewer for this feedback and included on page 14 is a sentence that underscores that many women reported being asked about their fertility intentions, suggesting that these providers did take the time for this component of FP counseling. Based on our experience with this, and other projects working with PPMVs in Nigeria specifically, we believe that there is an incentive to provide quality services in order to facilitate policy change, which would in turn also benefit their business and standing in the community. We added a sentence on page 15 to highlight the importance of client privacy.

The key main point, that fertility intentions are the main determinant of contraceptive use and continuation, remains valid and extremely important to the field.

**Minor improvements:**

- **Methods:** – Since the CPs and PPMVs were in charge of initially recruiting participants, how did you ensure the absence of bias in who the providers approached/ignored to participate in the study (e.g. skewed towards more educated, older, “most likely to continue” participants?).
  - **Response:** Meetings were held with CPs and PPMVs enrolled in this study to review the goals of the study, what information to provide to clients, and the importance of asking clients’ permission to share their information with a member of the research team. Informed consent, confirmation of eligibility criteria and enrollment was completed by a member of the research team. The inclusion criteria were also clearly discussed with CPs and PPMVs and we found that some women did not want to participate or did not own a phone independent of another family member.
- This may go beyond the scope of this manuscript but recent research on the role of side-effects in method discontinuation suggests that binary variables (“Did you experience side effects? Yes / No) are insufficient to grasp the influence of these side-effects in method (dis-)continuation. More specific questions on the intensity, length and “bearable” nature of those side-effects are much more effective predictors of future contraceptive behaviors.
  - **Response:** We thank the reviewer for this thoughtful comment. You raise a good question and we agree with the reviewer on the importance of these nuanced questions related to experience of side effects. We chose, however, not to add these questions due to the intended focus of the evaluation study. Another aspect for consideration is that women enrolled in this study could be

continued users or new users (new episode of use or new to contraceptives). As such, women who were continuing with contraceptive may no longer experience side effects or have decided to continue to use even with the experience of side effects.

- In Data Analysis, clarify *“were using FP because of their visit to a CP or PPMV”, makes it sound too restrictive, earlier in the Methods it sounds like women who initiated FP anywhere but continued resupplying their methods at a participating CP / PPMV could be recruited in the study as well?*
  - **Response:** That is correct. We changed the language to *“who began to use or continued to use a FP method as a result of their visit to a CP or PPMV”*

#### Results:

- In the sample description (socio-demographic characteristics), it would be interesting to comment on study participants' profile compared to average contraceptive users/women with unmet need in Nigeria (based on DHS or PMA survey)? This would also help addressing the question of possible recruitment bias raised above.
  - **Response:** We added some details related to the age and education of the women in our sample compared to contraceptive users in Nigeria in the second paragraph of the discussion section. It is important to note that this study was conducted among current users, and therefore is not representative of the broader Nigerian population.
- Figures 1 and 2 might be unnecessary? Results could be presented in a table or simple paragraph.
  - **Response:** Thank for this feedback. We added the figures to add some graphical representation in the article.
- Nuance *“Only 74% of women who were unsure...”* as this group represents only 3.7% of the sample, the validity of the findings must be nuanced.
  - **Response:** We updated sentence by removing the word *“only”* and simply stated the finding.
- Clarify the sentence: *“As stronger or more precise fertility intentions have been shown to be associated with the actualization of those intentions and that fertility intentions changed over time.”* There seem to be two separate statements and/or a fragment of the sentence is missing?
  - **Response:** We updated the sentence to read *“As fertility intentions change over time and stronger or more precise fertility intentions have been shown to be associated with the actualization of those intentions, CPs and PPMVs should also discuss fertility intentions with their clients often, consistent with recommendations from studies in Sweden and the U.S.”*
- Considering that a large share of women (almost a third) used implants, which are more difficult to *“discontinue”* (they require visit to health facilities and payment off fees at a minimum), the authors could have included sub-analysis of continuation patterns based on method used at baseline.

- **Response:** We looked at method discontinuation and found no statistical difference by method adopted. We highlight on page 5 that CPs and PPMVs were also trained in implant removal.

**Competing Interests:** No competing interests were disclosed.

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