Research Square

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Nearly Universal Receipt of Desired Contraceptive Method in Two Districts of Rwanda

Hilary Schwandt
hilary.schwandt@wwu.edu

Western Washington University
Phil Pendergast
Western Washington University
Mumtaz Ahmed
St. Catherine University
Julianna Azares-Burns
Western Washington University
Alyssa Geolamin
Western Washington University
Claver Hategekimana
Skagit Valley College
Denyse Kabera
University of Rwanda
Kelsey Kotts
George Washington University
Kelly Lin
University of California, Berkeley
Karina Lopez
University of Maryland, College Park
Salomon Mbouombouo
Skagit Valley College
Yessenia Moncada
Western Washington University
Taylor Montgomery
University of Alabama
Pascal Mpihirwe
University of Rwanda
Dieudonne Muhoza
University of Rwanda
Dieudonne Musemakweli
INES-Ruhengeri
Vanessa Niyomubyeyi
INES-Ruhengeri
Tess Reding Hoffart
Western Washington University
Michelle Rickwa
Gonzaga University
Natalie Sandoval
Hobart and William Smith Colleges
Alex Schultz
Creighton University
Eva Strelitz-Block
The University of Texas at Austin
Ruth Ufitimbabazi
University of Rwanda
Chantal Umutoni
INES-Ruhengeri
Lyse Uwera

INES-Ruhengeri
Ryleigh Vaughn
Western Washington University
Julia Viega
University of California, Berkeley
Ryan Wells
Western Washington University
Seth Feinberg
Western Washington University

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Abstract

Background

Research demonstrates that when contraceptive users receive their desired method, they are more likely to maintain contraceptive use, avoid pregnancy, and report satisfaction with family planning. Rwanda has increased family planning use dramatically in a short period of time, from 17% to 69% between 2005 and 2025. This study aims to investigate the role of client receipt of desired method during counseling with family planning nurses at public health clinics or posts in two districts of Rwanda.

Methods

This study involved data extraction in 2022 and 2023 from family planning records at a sample of public health facilities in two districts of Rwanda, the two districts with the highest and lowest contraceptive prevalence rates in the nation. Extraction from the family planning record included the family planning client's desired method as stated and recorded prior to counseling as well as the client's method received after counseling.

Results

Results show that 95%-97% of a sample of long-acting method users in these two districts received their desired method. Further, multilevel analysis examines correlates of not receiving desired method and finds that individual level client variables explain relatively little variation, while facility-level factors account for most differences in desired method provision in Rwanda.

Conclusion

Contraceptive users in Rwanda are obtaining their method desired nearly all of the time, meeting client's method desires is integral to successful contraceptive use and providing human centered services for individuals, family planning programs, and nations.

Background

Globally, 44% of births are unintended, with more unintended births in developing as compared to developed nations (1). Family planning programs are effective means to reduce maternal mortality via a reduction in unintended pregnancies. Family planning consists of giving people the choice to decide the number and timing of desired children, supporting the health of parents and children. This includes providing options for contraception to help prevent unwanted pregnancy and obtain the number of children desired.

The global impact of family planning can be measured through women's experiences and participation in numerous aspects of life, including education, financial stability, career opportunities, and physical well-being. Currently, 219 million women are using some type of contraception (2), yet 218 million women continue to have unmet contraceptive need (3). Increasing contraceptive choice can help tackle unmet need (4, 5). In particular, ensuring women receive their desired method of contraception has been shown to reduce rates of discontinuation and support users' autonomy over their reproductive health and decision-making (6, 7).

One country that has had success with the implementation of a national family planning program is Rwanda (Schwandt, et al., 2021; Schwandt et al., 2018). Efforts to increase access to family planning services include the implementation of community-based health programs such as community health workers and the decentralization of health structures (10). Combined with consistent messaging from government and media (11), these steps have helped to improve access, especially for those living in rural areas (12).

Research has shown the importance of access to contraception to aid couples in achieving their family size desires (Schwandt, et al., 2021). One barrier to contraceptive access is provider bias. Family planning providers can display bias in terms of age, marital status, education, parity, and partner consent (14). Research on long-acting reversible contraception (LARC) method restrictions have found that partner-related characteristics, such as partner consent and marital status, can be factors for provider bias in LARC method service provision (14, 15).

Discontinuation of contraceptive methods, despite a desire to continue to avoid pregnancy, is very common and a major challenge for family planning programs. Researchers examining data from 36 developing countries estimated that approximately a third of unintended births are due to contraceptive discontinuation. Globally, these findings suggest that 25 million of 75 million unintended births are due to contraceptive discontinuation (Jain and Winfrey, 2017). Often the most common reason for discontinuation for those who wish to continue to prevent pregnancy is method related—such as health concerns or the experience of side effects. Discontinuation rates vary widely by context and program, from 18–63% in the first year of use (17); however, discontinuation has been reported as significantly more common in sub-Saharan Africa compared to other world regions. Discontinuation in Rwanda is 30% after one year of use (18), despite efforts to reduce discontinuation (Schwandt, et al., 2021).

Quality of care is an important factor affecting discontinuation, including women's access to their desired method of contraception (20). Family planning clients who obtain their desired method of contraception are much more likely to continue contraceptive use as compared to those who do not receive their desired method (6, 21, 22), to avoid unwanted pregnancy (21), and to be satisfied with their family planning choice (23).

In Malawi, 37% of women were found to be using their preferred method, and when there was discordance, many preferred a more effective method. Additionally, those who were using their preferred method were six times more satisfied than those who were not (23). In urban Kenya, Nigeria, and Senegal, 42% of women were using their preferred method of contraception and demonstrated a 25% higher probability of method continuance compared to women not using their preferred method (22). In Togo, 88% of women received their desired method, with married women reporting even higher rates (15).

Given the significance of meeting family planning client desires and minimizing discontinuation rates, alongside the unique opportunity to study desired method receipt directly from client intake forms in Rwandan family planning clinics, this study aims to measure LARC users' receipt of their desired method at public health facilities in the districts of Musanze and Nyamasheke, Rwanda.

Methods

This study involved data extraction in 2022 and 2023 from family planning records at a sample of public health facilities in two districts of Rwanda. The facilities ranged from clinics connected to hospitals to remote rural clinics. The two districts are Musanze, with the highest contraceptive prevalence in the nation, and Nyamasheke, with one of the lowest. In each district, all public family planning facilities and health posts providing modern methods of contraception to at least 100 clients per month were rank ordered by client volume to derive a stratified list of facilities, from which every 2nd (Musanze) or 3rd (Nyamasheke) were selected for study inclusion (k = 17). At each sampled facility, data from all current LARC users were eligible for analysis. For the study's inclusion criteria, LARC users included implant or IUD acceptors who initiated LARC use at first visit or who later switched to LARC use over the observation period, data come from visits between 2013 and 2023. Notably, clients who did not indicate a desired contraceptive method were excluded from the study because it would be impossible to determine concordance with the method received.

Data Collection

At the time of their initial visit, all clients meet with a family planning nurse. The nurse completes an intake form with the client, which includes demographic information, pregnancy and childbirth history, contraceptive use desires, and prior use experience. Next, clients are counseled on all contraceptive methods and asked what method they select. Information on the method provided is then entered onto the form at the conclusion of their visit. Follow-up data are also collected using the same form when clients returned for visits. The study team entered data from each client record into Microsoft Excel using data validation checks, which sets rules for the types of allowable data expected per cell to help avoid data entry errors (i.e. set minimum and maximums, set possible values). The data from each recorder and facility were then collated. All facilities files were then collated and cleaned.

Ethical approval

to extract these data was provided by the Rwandan National Ethics Committee and Western Washington University Institutional Review Board.

Analysis

A series of descriptive and model-based analyses were conducted to investigate what factors appear to impact receipt of desired contraceptive method among Rwandan women. The outcome variable for this analysis is a binary measure indicating whether clients ultimately received their initial, desired contraceptive method versus some other method from the clinic.

The analysis sample consists of all women for which surveyed clinics provided information on desired and received contraception over the study period (N = 21,456). Among these women, a substantial portion (N = 10,148; 47.3%) were missing data on at least one demographic, pregnancy, or fertility-related characteristic that theoretically informs contraceptive choice; most commonly, educational attainment among demographics and ever having had a child die, ever having had an abortion, or being in the postpartum period, among pregnancy and fertility characteristics. An empirical investigation of these missing data did not suggest that the missingness was strongly correlated with other measured study variables, leading to a conclusion that it is reasonable to treat the data as missing at random and a good candidate for multiple imputation. All study characteristics are categorical, which caused issues with complete and quasi-complete separation when attempting to use the standard set of multiple imputation via chained equation commands in Stata 18; instead, the user-written "ice" Stata procedure was employed (24) to create 20 imputed datasets with an augmented regression method that helps reduce bias resulting from perfect prediction (25). Results were then combined and summarized across datasets using Stata's MI suite of commands to apply Rubin's rule (26). The use of these methods allows the inclusion of the full sample in the outcomes analysis; however, as a sensitivity test, the descriptive statistics are also presented for the complete case data (N = 11,308), and all imputed models were compared to similar specifications with the complete case data. Both analysis samples returned qualitatively and quantitatively similar results to those reported here (regression results available upon request).

The results of the descriptive and bivariate analyses for both the complete case and multiple imputed samples are presented by district in Table 1. To determine whether there are significant differences in other study descriptive characteristics for women who did and did not receive their desired contraceptive method, chi-square tests for the complete case sample and logistic regression F-tests for the imputed data were used.

Finally, it is reasonable to assume that clients who use the same clinic are more likely to be similar in both demographics and preferences for contraceptive methods than clients who attend different clinics due to geographic variation in population clustering, resource distribution, and cultural expectations. As such, standard regression techniques would violate the assumption that observations are independent of each other, leading to biased estimates and standard errors if unaddressed. To alleviate this issue, multilevel logistic regression models (27) with random intercepts and cluster robust standard errors for the facility attended were fit using Stata's "xtmelogit" procedure to examine the relationships between receipt of desired method and age, marital status, education, number of children, experience of child death, abortion, being in the postpartum period, use of contraception for spacing, and any prior contraceptive use. These models also facilitate understanding about how much of the variation in the outcome is due to the facility that clients attend by

computing the intraclass correlation coefficient for facility membership (28). Due to the descriptive examination revealing some evidence of substantial variation in the relationship between the outcome and pregnancy and fertility characteristics by district, the model presents results both overall and by district to better understand the factors that impact contraceptive receipt for Rwandan women.

Table 1
Contraceptive Method Desired and Received at Facilities in Two Districts in Rwanda, 2022–2023

	Musanze		Nyamasheke	
	% Desired	% Received	% Desired	% Received
	(n = 7,412)	(n = 7,412)	(n = 3,896)	(n = 3,896)
Implant	86.8	88.5	89.2	93.4
IUD	3.1	2.9	3.6	3.8
Other	10.1	8.6	7.2	2.8

Results

Unless noted otherwise, results described below are derived from the multiple imputed analysis. The proportion of women receiving their desired method showed little variation by district (Musanze = 97.1%, Nyamasheke = 95.0%), with almost everyone across sites (96.2%) receiving the method they chose at their initial visit.

Table 1 examines receipt of method by method desired for the complete case sample. The majority of the sample in both districts desired the implant (86.8–89.2%) and even more received the implant (88.5–93.4%). Only 3.1–3.6% of the sample desired the IUD, with about the same percentage receiving the IUD (2.9–3.8%) in both districts. Among those desiring other methods (10.1% in Musanze and 7.2% in Nyamasheke) such as injectables, pills, condoms, and female sterilization, 8.6% in Musanze and 2.8% in Nyamasheke received those methods. In general, women in both districts tended to receive their desired method of contraception, and when this was not the case (as was somewhat more common in Nyamasheke), women often received an implant instead of other methods.

Table 2 Binary Relationship Between Contraceptive Method Desired and Received with Sociodemographics about here

When examining receipt of desired method by demographics in Musanze, younger clients and those with fewer children, who are currently postpartum, who are using contraception for spacing rather than limiting, and who had no prior use of contraceptives were significantly ($p < 0.05$) more likely to receive their desired method. In Nyamasheke, only the postpartum variable was significant at the 0.05 level – those who were postpartum were more likely to receive their desired method than those who were not in the postpartum period – though there was a trend toward significance ($p < 0.10$) for younger women to receive their desired method, similar to Musanze women. The trends from the complete case analysis and multiple imputed samples were similar and are presented in Table 2.

The results of the multilevel models are presented in Table 3 as both unadjusted and adjusted odds ratios to compare how characteristics impact receipt of desired method both before and after covariate adjustment, overall and by district. These results reveal the importance of both women's demographic and pregnancy/fertility-related characteristics and of taking facility variation into account. While unadjusted models mirror many of the patterns from the descriptive analysis, across both districts, overall, the only significant predictor of not receiving one's desired contraceptive method in the multivariate analysis is being postpartum, with postpartum women having about 30% lower odds of not receiving their desired method than women who are not postpartum (OR = 0.70; $p < 0.01$); though, it is worth noting that having four or more children marginally increases the odds (OR = 1.28; $p < 0.10$) of failing to receive the desired contraception compared to those with fewer children. There is also substantial variation in receiving desired method by facility, with approximately 9% of the variance in the outcome (ICC = 0.09) explainable by the facility that women attended.

Table 3 Adjusted Relationship Between Contraceptive Method Desired and Received with Sociodemographics about here

While district was not a significant predictor in the multivariate analysis, overall, both the descriptive analysis and unadjusted model suggested differences in the magnitude of the relationship between receiving desired contraception and clients' characteristics; thus, the results of the multilevel models are also presented separately for Musanze and Nyamasheke. In sum, both women's characteristics and the facility where they received care seemed to matter more for Musanze women receiving their desired contraceptive method than was obvious from the overall model. Musanze women with more education (OR = 1.40; $p < 0.05$), more children (OR = 1.55–1.84; $p < 0.05$), prior abortion experience (OR = 1.61; $p < 0.05$), and who report using contraception for spacing (OR = 1.47; $p < 0.01$) face higher odds of failing to receive the method they desired than their counterparts with less education, fewer children, having had no previous abortions, or who use contraception for limiting. In addition, 11% of the variance in receiving one's desired contraceptive method is explainable by the facility in Musanze that clients received care (ICC = 0.11). The results for Nyamasheke are much more in line with those of the overall model, with only being postpartum (OR = 0.68; $p < 0.05$) predicting significantly reduced odds of not receiving clients' desired method and 9% of the variance in the outcome due to differences by facility (ICC = 0.09).

Discussion

Nearly the full sample of LARC users in Musanze and Nyamasheke, Rwanda, received their desired method, with just 3–5% of women receiving a different method than desired in these two districts in Rwanda. In comparison, prior research on receipt of desired methods found that 88% of women in Togo (15) and 86% in East Java (6) received their desired method. Studies in Malawi and urban Kenya, Nigeria, and Senegal found method preferred and use match to be between 37% and 42% (22, 23). Similarly, a review on method preference and mismatch with method currently used found ranges of discordance between 18% and 67% across samples (21). The results from this study suggest rates of meeting contraceptive client's desired methods is higher in Rwanda than in other settings, likely meaning lower discontinuation and unwanted pregnancy rates, and signaling a family planning program responsive to family planning client desires.

There were differences between this study and the others referenced here on desired method receipt. This study is the only one extracting existing data from individual family planning client records, which includes a record of method desired that was recorded prior to receipt of actual method. The other studies either examine receipt of desired method via client exit interview, longitudinal survey personal report, or matching retrospective client-expressed method preference with current method used, which may be more prone to recall bias than prospective data collection via client records.

Having choice of methods and ultimately receiving the method desired is foundational to a healthy family planning program (29). Researchers have called for more attention to method choice and receipt of desired methods to avoid user dissatisfaction, discontinuation, and unwanted pregnancies (21, 23).

Upon further, multivariate examination of the relationship between client characteristics and concordance in desired and received contraceptive method, several associations were observed that highlight the importance of place and, to a less general extent, demographics and pregnancy and fertility preferences. Overall, facility emerged as an important factor in predicting whether women did not receive the contraceptive method that they initially chose, accounting for about 10% of the variance in method concordance. Of individual factors, being in the postpartum period was consistently associated with higher odds of women receiving their chosen method. In the Musanze district, but not Nyamasheke, additional characteristics were important predictors of receiving desired method, with having more education, more children, ever having had an abortion, and currently using contraception for spacing rather than limiting further increasing the odds of not receiving the contraceptive method that women initially chose. These findings differ from other research in the region looking at preferred method matching prospectively. In that research there were additional differences in receipt of desired method by demographics, such as women being more likely to be in a union, less likely to want more children, and to live in poverty (15, 22).

This study suffers from a few limitations. Family planning nurses filled out the client forms for each family planning client – recording the desired method as well as the method received. It is possible that the family planning nurses indicated the desired method after the client selected their desired method to artificially indicate meeting client method desires. This is unlikely, however, as the family planning client forms are input and kept locally at each family planning clinic and not sent to others for review nor are the data entered for government use, as clinics only report on aggregate method receipt data to the government. Family planning clients must know about the family planning method options available to indicate a desire for a method, although this is unlikely a limitation as most Rwandans have universal knowledge of contraceptive methods (30). Furthermore, family planning client users who didn't indicate a desired method were omitted from the analysis. Only users who either initially picked a LARC method, or switched to one at a later time, were included in the sample – meaning that those who desired an implant or IUD, but never used either, are not included in these data. This may have inflated rates of method concordance. This study is also limited to only the two districts in Rwanda with the nation's highest and among the lowest contraceptive prevalence rates, so the findings here cannot be generalized to the entire country; however, they do represent the full range of contraceptive access in Rwanda, and relatively few differences in predictors of receiving desired method across districts were observed. Data collection was also limited to data available on the family planning client forms, meaning it is possible that demographic factors not collected on the form, such as nativity and accessing services in the region of residence or not, might have helped describe the difference between those who received their desired method and those who did not. Errors were noted on the forms during data entry, as well as omitted data, and errors when entering data from forms into the computer also likely occurred despite robustness checks.

Despite its limitations, the study has several strengths. This study examines administrative client records data on receipt of desired method in Rwanda, a nation with a successful family planning program. In particular, the family planning client form in Rwanda asks new clients about their desired method prior to any family planning counseling, and then records their method chosen after counseling and provision of method. Thus, this study can assess whether clients are receiving their desired method based on self-report as opposed to after receipt of method, as is often the case in similar research. Additionally, this study is unique in the ability to report on what percent of clients receive desired method from clinic records. This study also includes a large sample from two districts, purposefully selected based on having the highest and lowest levels of contraceptive prevalence in the nation, which show that both facilities and client characteristics are important sources of variation in the chances of receiving desired contraceptive methods and that the salience of these characteristics varies by district. With growing interest and use of implants in the region, it is particularly helpful to have more information on family planning client's receipt of desired LARC methods.

Conclusion

Clients who either initially or eventually select a LARC as their contraceptive method are receiving their desired method of choice 95–97% of the time at health facilities and posts in two districts of Rwanda. The nearly universal receipt of desired method signals part of the success of the family planning program in Rwanda, particularly because individuals who receive their preferred method are less likely to discontinue use. Importantly, client's access to their desired method also reflects their agency in their reproductive health decision-making and responsive service delivery to that agency (23). Rwanda has had great success in ensuring family planning clients are able to receive their desired method of contraception, and with some modifications to meet the needs of every client, the program could meet the desires of all clients.

Declarations

Ethical approval and consent to participate

This study was reviewed and approved by the ethical review boards at Western Washington University and at the Ministry of Health in Rwanda. This study adhered to the Declaration of Helsinki.

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

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Author Contribution

HMS designed the study. HMS, MA, JA, AG, CH, DK, KK, KL, KL, SM, YM, TM, PM, DM, DM, VN, TR, MR, NS, AS, ES, RU, CU, LU, RV, JV, RW, and SF collected the data. HMS and PP prepared the tables and wrote the main manuscript text. All authors reviewed the manuscript.

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Data Availability

The data used during the current study are available from the corresponding author upon approval from the Rwandan Government.

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Tables

Table 2 and 3 are available in the Supplementary Files section.

Supplementary Files

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- Table220Oct2026.xlsx
- Table320Oct2026.xlsx