



## RESEARCH ARTICLE

# Who uses covertly and what is the impact on contraceptive dynamics? Evidence from a national cohort of women in Uganda [version 1; peer review: awaiting peer review]

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## Open Peer Review

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## Abstract

**Background:** Little is known regarding the specific role of covert use (i.e., use of contraception without partner knowledge) in contraceptive discontinuation and switching. Among a nationally representative cohort of women in Uganda, we sought to: 1) compare characteristics of covert, overt, and non-users of contraception at baseline; 2) assess the effect of using contraception covertly on switching and discontinuation over a one-year period.

**Methods:** Analyses utilized PMA2020 Uganda Round 6 (April–May 2018), with longitudinal analyses incorporating data from a one-year follow-up survey (May–June 2019). Both cross-sectional (n=1,764) and longitudinal (n=616) samples included women in need of contraception. For cross-sectional analyses, multinomial regression compared risk of overt/covert use vs. non-use by user characteristics and logistic regression compared the odds of covert vs. overt use among contraceptive users. For longitudinal analyses, multinomial regression examined risk of contraceptive switching and discontinuation by baseline covert vs. overt use status.

**Results:** Among contraceptive users, 14.1% reported using covertly. In cross-sectional analyses, higher wealth (aRRR=1.74; 95% CI=1.19-2.54), secondary or higher education (aRRR=2.52; 95% CI=1.42-4.49), and middle parity (aRRR=1.24; 95% CI=1.00, 2.28) were associated with an increased risk of overt use, and higher wealth (aRRR=2.08; 95% CI=1.09-3.98) and polygyny (aRRR=1.60; 95% CI=1.01-2.54) with covert use, compared to non-use. Among contraceptive users, women within polygynous unions had double the odds of using covertly compared to those with monogamous partners (aOR=1.97; 95% CI=1.28-3.03). Longitudinal analyses revealed large proportions of overt and covert users switched (30% overt, 26% covert) or discontinued methods (32%

overt, 37% covert) at one-year follow-up, however, neither switching nor discontinuation was significantly related to overt/covert use status at baseline.

**Conclusions:** Though significant differences by covert use status were not detected, approximately 33% of users discontinued over one year; these women represent important beneficiaries of family planning programming as they may remain at risk for unintended pregnancy.

## Keywords

contraceptive dynamics, covert use, partner involvement, family planning

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## Introduction

Covert use of contraception is a strategy for women to achieve their reproductive goals when faced with compromised control over reproductive decisions<sup>1,2</sup>. Using contraception covertly may be risky—recent quantitative evidence from Niger indicates positive association between intimate partner violence and covert use among married adolescent girls<sup>3</sup>. Contextual factors may also impact women's ability or desire to use covertly, with evidence from Nigeria revealing that covert users are more likely to live in communities with higher contraceptive prevalence and higher female employment compared to non-users; however, at the individual level, covert users were less educated and poorer than overt users<sup>4</sup>. Understanding who uses contraception covertly is necessary to encourage tailored family planning messaging in order to maximize women's reproductive autonomy and safety.

Numerous studies have aimed to quantify prevalence of covert use, with estimates in sub-Saharan Africa reporting that between 15% to 77% of women use contraception without their partners' knowledge<sup>1,5</sup>. Large-scale surveys, including the Demographic and Health Surveys (DHS), previously measured covert use via one direct question, which asked the female respondent whether her partner knew of method use; however, this item was recently dropped from the majority of surveys. Another method to measure covert use is the comparison of women's and men's contraceptive use reports, though this approach is resource-intensive and responses differ substantially from the direct item<sup>5,6</sup>. While measurement remains imperfect, continued monitoring of covert use trends and correlated contextual factors that may impact covert versus overt use are important to understand shifts in method mix<sup>7</sup>.

To date, little is known on the specific role of covert use in contraceptive discontinuation and switching. Qualitative research in West and East Africa suggests difficulty continuing contraception for covert users<sup>1,8–10</sup>, which may lead to switching to a more readily available or concealable contraceptive method or discontinuing method use altogether. To date, however, quantitative data have been cross-sectional in nature, with no nationally representative longitudinal studies utilized to assess this relationship over time. This study addresses this methodological gap by using longitudinal data to compare characteristics of covert, overt, and non-users of contraception and evaluate contraceptive discontinuation and switching by covert versus overt use among a national representative cohort of Ugandan women followed over a one-year period.

## Methods

### Study design and study population

We used data from a representative panel of reproductive age women conducted within the Performance Monitoring and Accountability 2020 (PMA2020) project in Uganda in 2018 and 2019. The baseline (PMA Uganda Round 6) was conducted from April–May 2018 and the follow up was conducted in May–June 2019. PMA2020 is a data collection platform designed to monitor key family planning indicators in 11 countries using nationally representative surveys. Additional

detail on methods for PMA2020 are available elsewhere<sup>11</sup>; surveys and study instruments are available at [www.pmadata.org](http://www.pmadata.org).

After providing consent, 4,227 women were interviewed at baseline. Of these women, 4,038 agreed to participate in the follow-up survey (acceptance rate=94.4%), and 2,717 women were re-interviewed one year later (follow-up rate=67.7%), while 1,258 were lost to follow-up because they moved out of the enumeration area and five women died. To address potential bias from loss-to-follow-up, an inverse propensity score was constructed by estimating the predicted probability of loss-to-follow-up according to age, parity, marital status, schooling, wealth quintile, and residence and multiplied to existing weights. [Table 1](#) compares the responses of the full sample of women at baseline and those that were identified for follow-up, both weighted and unweighted; after adjustment, there were no differences between baseline women versus those at one-year follow-up.

Institutional Review Board (IRB) approval was obtained at both Johns Hopkins Bloomberg School of Public Health (IRB00008436) and Makerere University School of Public Health (IRB081), as well as Uganda National Council for Science and Technology (SS3400). All eligible participants provided written informed consent; head-of-household consent with written assent was obtained for young women under age 18.

### Analytic sample

The first analytic sample focused on cross-sectional analysis of factors associated with covert, overt, and non-use of contraception at baseline. The cross-sectional analytical sample comprised 1,764 women in need of contraception (i.e., were in union and sexually active within the past year, were not pregnant, did not want to get pregnant within a year, and were not self-reported infertile) and with complete covert use data.

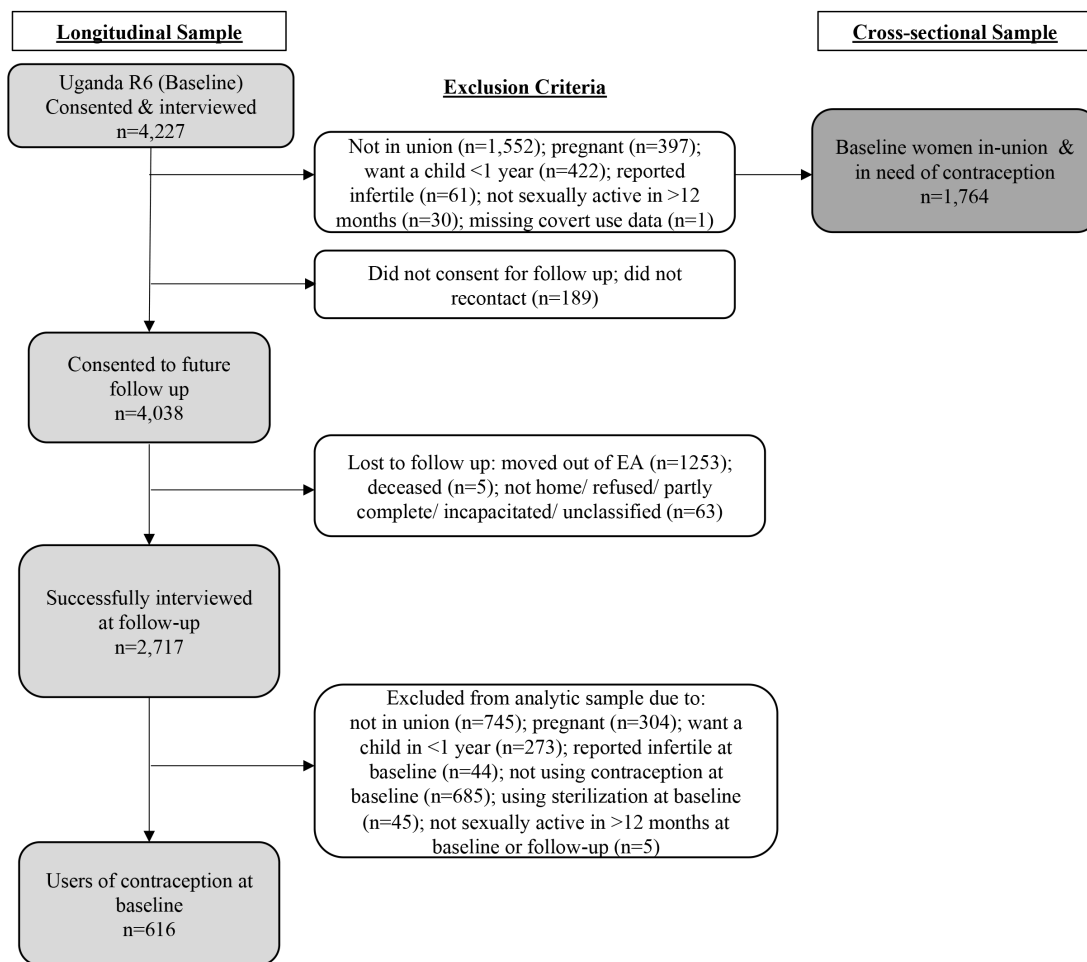
The second analytic sample was used to prospectively examine contraceptive discontinuation and switching using the baseline and follow-up survey data (herein referred to as longitudinal sample). From the 2,717 women who were followed up one year later, we excluded women who were not in need of contraception or who were using a sterilization method of contraception, resulting in a total longitudinal sample of 616 women. [Figure 1](#) shows a flow chart for each analytic sample and reasons for exclusion.

### Measures

*Type of contraceptive use (non-use, overt, covert)*: Contraceptive use was assessed by asking women if they were doing anything to avoid a pregnancy at the time of the survey and if so, what method they were using. Covert use of contraception was defined by a single item asking female-controlled method (hormonal methods, intrauterine devices [IUD], and fertility awareness methods) users if their husband/partner knew that they were currently using a method of contraception. In this analysis, we considered a woman an overt user if she was using a male-dependent method (male condoms and withdrawal).

**Table 1. Loss-to-follow-up weighting.**

	Unweighted			Weighted		
	Round 6 Only (%)	Round 6 Follow-Up (%)	p-value	Round 6 Only (%)	Round 6 Follow-Up (%)	p-value
Age (mean)	27.94	29.76	<0.001	27.85	27.91	0.74
Married or in-union	63.27	72.56	<0.001	63.83	64.19	0.75
Urban	27.22	20.87	<0.001	22.38	23.08	0.65
Ever given birth	73.90	82.25	<0.001	74.39	74.91	0.69
Education						
None	12.23	14.70	<0.001	9.49	9.25	0.49
Primary	53.41	56.95	<0.001	54.77	54.46	0.76
O-level	24.99	21.49	<0.001	26.19	26.38	0.86
A-level +	9.38	6.86	<0.001	9.55	9.91	0.56
Delay pregnancy 2+ years	75.51	76.77	0.22	76.85	77.87	0.19
Using modern method	28.15	29.44	0.25	30.28	30.07	0.79
Overt use of contraception	78.84	81.55	<0.001	79.05	81.16	0.10



**Figure 1. Analytical Samples and Exclusion Criteria.**

**Contraceptive discontinuation/switching:** Women's contraceptive use at baseline and follow-up interviews was used to define a three-category outcome measure, categorized as: 1) contraceptive discontinuation (user of contraception at baseline who was no longer using contraception at follow-up); 2) contraceptive switching (using two different methods at baseline and follow-up); or 3) contraceptive continuation (user of the same contraceptive method at baseline and follow-up).

**Covariates:** Sociodemographic characteristics included age, parity, education, wealth, area of residence, and polygyny, which have been shown to influence contraceptive use. Small categories were combined based on bivariate distributions; specifically, wealth quintiles were dichotomized based on small distributions of lowest wealth quintiles. We further assessed multi-collinearity between covariates; given high correlation ( $>0.4$ ) between age and parity, only parity was included in adjusted models, as it was postulated to theoretically influence covert use.

### Analytical approach

This analysis is structured in two parts: 1) a cross-sectional analysis of factors associated with type of contraceptive use (no use/ covert use/ overt use), and 2) a longitudinal analysis of contraceptive discontinuation or switching between baseline and follow-up, according to overt versus covert use. All analyses were conducted in STATA 16 (College Station, TX), with significance set at  $<0.05$ , incorporated survey weights, and accounted for complex survey design.

For the cross-sectional analysis, household, individual, partner, and contraceptive characteristics of women according to type of contraceptive use (covert/overt/non-use) were first examined using descriptive statistics and design-based F-statistics. Second, multinomial regressions were conducted comparing the risk of overt use and covert use versus non-use of contraception by specified characteristics. We then used logistic regression to evaluate the odds of covert use versus overt use among users of contraception according to household, individual, and partner characteristics.

For the longitudinal analysis, we conducted exploratory analysis to determine the percentage of users who discontinued or switched their method at follow-up according to whether they were using their method covertly or overtly at baseline. Bivariate and multivariable multinomial regressions were then used to evaluate the relative risk ratio (RRR) of contraceptive discontinuation and switching compared to continuation, according to covert versus overt use of contraception at baseline, after adjusting for relevant covariates.

## Results

### Cross-sectional analysis

Household, individual, partner, and contraceptive characteristics at baseline by contraceptive use status are provided in [Table 2](#). Generally, women resided in rural areas (82.9%), had completed primary education or less (71.3%), and had two or more children (86.1%). Household wealth ( $p<0.001$ ), polygyny

( $p<0.001$ ), women's education ( $p<0.001$ ) and parity ( $p=0.05$ ) differed significantly by contraceptive use status. Among users of contraception, 14.1% were classified as covert users, and method mix differed by contraceptive use status ( $p<0.001$ ); the majority of covert users reported injectable use (63.2%), whereas overt users utilized a broader range of methods, namely, injectables (34.6%), implants (26.0%) and other methods (16.5%).

We present results of unadjusted and adjusted multinomial regressions assessing factors related to covert and overt use relative to non-use in [Table 3](#). Higher wealth was associated with an increased risk of covert use (aRRR=2.08; 95% CI=1.09-3.98) and overt use aRRR=1.74; 95% CI=1.19-3.98), compared to no contraceptive use. Women with secondary or higher education had increased risk of using contraception overtly compared to non-use (aRRR=2.52; 95% CI=1.42-4.49), as did women of middle parity (2-4 children; aRRR=1.51; 95% CI=1.00-2.28); education and parity were not similarly related to risk of covert use. Within the context of polygynous relationships, however, women displayed an increased risk of using contraception covertly (aRRR=1.60; 95% CI=1.01-2.54) compared to women in monogamous unions, once adjusted for demographic characteristics. Residence and age were not associated with overt or covert use, compared to non-use.

We further compared the characteristics of covert vs. overt users, among users of contraception, via logistic regression (data not shown). In the adjusted model, only polygyny was significantly associated with covert compared to overt use—women who reported their partners had other wives had twice the odds of using covertly than those who reported their partners were monogamous (aOR=2.01; 95% CI=1.29-3.14).

### Longitudinal analysis

We then examined the relative risk of discontinuation and switching over a one-year period, compared to continued contraceptive use, by covert versus overt use at baseline (data not shown). Approximately 31.5% of overt users and 35.5% of covert users discontinued their method completely. An additional 30% of overt users (29.7%) and one-quarter of covert users (26.2%) at baseline had switched methods one year later. Neither switching nor discontinuation at one-year follow-up were significantly related to type of contraceptive use (covert versus overt use) at baseline.

## Discussion

These results highlight important scenarios by which women use contraception covertly and how their characteristics differ from non-users and overt users of contraception. Women within polygynous partnerships had double the odds of covert compared to overt use, which was the only distinguishing characteristic by contraceptive status. Moreover, in longitudinal analysis, covert versus overt use of contraception was not significantly associated with either discontinuation or switching at one-year follow-up; these null results were contrary to our hypothesis that covert users may face increased difficulty concealing method use, therefore needing to switch

**Table 2. Characteristics of Ugandan women overall and by contraceptive use status, among Ugandan women in need of contraception<sup>§</sup> (Cross-sectional sample 2018 n=1,764).**

Baseline Characteristics	Overall (n=1,764)	Contraceptive Use			p-value
		Non-Users (n=869)	Overt Users (n=777)	Covert Users (n=118)	
column %					
<i>Household Characteristics</i>					
Household Wealth					
Lower	65.77	74.37	58.30	59.31	<b>&lt;0.001</b>
Higher	34.23	25.63	41.70	40.69	
Residence					
Urban	17.10	15.74	18.66	16.12	0.59
Rural	82.90	84.26	81.34	83.88	
<i>Individual Characteristics</i>					
Age (Years)					
15–24	25.81	26.34	27.07	15.15	0.21
25–34	40.63	38.81	41.63	44.96	
35+	33.56	34.85	31.29	39.90	
Highest Schooling Level					
None	12.32	16.43	8.40	11.16	<b>&lt;0.001</b>
Primary	58.97	62.31	55.09	61.62	
Secondary+	28.71	21.26	36.51	27.22	
Parity					
0–1 children	13.97	14.27	13.78	13.40	<b>0.05</b>
2–4 children	43.69	39.70	48.90	36.83	
5+ children	42.35	46.03	37.31	49.77	
<i>Partner Characteristics</i>					
Polygyny					
Partner has no other wives	63.38	62.62	66.21	51.55	<b>&lt;0.001</b>
Partner has other wives	30.15	32.69	25.35	42.92	
<i>Contraceptive Characteristics</i>					
Method Mix					
Female sterilization	6.38	--	7.10	2.11	<b>&lt;0.001</b>
Implant	25.43	--	25.95	21.25	
IUD	2.93	--	2.60	4.99	
Injectables	38.56	--	34.61	63.18	
Pills	5.20	--	5.25	4.97	
Emergency Contraception	0.15	--	0.18	0.00	
Male Condom	6.56	--	7.64	0.00	
Female Condom	0.13	--	0.15	0.00	
Other	14.67	--	16.52	3.51	
Covert/overt use, among users of contraception (row %)			85.93	14.07	

<sup>§</sup>In need of contraception: Women who in R6 were in union, sexually active in the past year, not currently pregnant, reported not wanting to get pregnant in the next year, and were not self-reported infertile. See [Figure 1](#).

P-value from design-based F-statistic

**Table 3. Multinomial logistic regression examining baseline characteristics for covert and overt use compared to non-use among Ugandan women in need of contraception<sup>§</sup> at baseline (2018; n=1,764).**

Baseline Characteristics	Unadjusted		Adjusted	
	Overt Users (n=777)	Covert Users (n=118)	Overt Users (n=777)	Covert Users (n=118)
Relative Risk Ratio (RRR) (95% CI)				
<i>Household Characteristics</i>				
Household Wealth				
Lower	ref	ref	ref	ref
Higher	<b>2.08***</b> (1.42, 3.02)	<b>1.99*</b> (1.11, 3.57)	<b>1.74**</b> (1.19, 2.54)	<b>2.08*</b> (1.09, 3.98)
Residence				
Urban	ref	ref	ref	ref
Rural	0.81 (0.50, 1.33)	0.97 (0.44, 2.13)	1.31 (0.87, 1.97)	1.32 (0.57, 3.07)
<i>Individual Characteristics</i>				
Age (Years)				
15–24	ref	ref	--	--
25–34	1.04 (0.73, 1.49)	2.09 (0.85, 4.78)	--	--
35+	0.82 (0.60, 1.13)	1.99 (0.88, 4.49)	--	--
Highest Schooling Level				
None	ref	ref	ref	ref
Primary	<b>1.73*</b> (1.09, 2.76)	1.46 (0.65, 3.28)	1.58 (0.98, 2.55)	1.45 (0.63, 3.33)
Secondary or Higher	<b>3.36***</b> (1.96, 5.78)	1.88 (0.75, 4.71)	<b>2.52**</b> (1.42, 4.49)	1.67 (0.59, 4.78)
Parity				
0–1	ref	ref	ref	ref
2–4	1.28 (0.86, 1.89)	0.99 (0.44, 2.23)	<b>1.51*</b> (0.95, 2.29)	1.02 (0.44, 2.36)
5+	0.84 (0.56, 1.26)	1.15 (0.53, 2.51)	1.24 (0.83, 1.86)	1.29 (0.54, 3.06)
<i>Partner Characteristics</i>				
Polygyny				
Partner has no other wives	ref	ref	ref	ref
Partner has other wives	0.73 (0.53, 1.00)	<b>1.59*</b> (1.04, 2.43)	0.78 (0.56, 1.07)	<b>1.60*</b> (1.01, 2.54)

Adjusted for: parity, education, residence, polygyny, and wealth

\*p&lt;0.05; \*\*p&lt;0.01; \*\*\*p&lt;0.001; bolded values significant at p&lt;0.05

<sup>§</sup> In need of contraception: Women who in R6 were in union, sexually active in the past year, not currently pregnant, reported not wanting to get pregnant in the next year, and were not self-reported infertile.



methods or discontinue use altogether, and warrant further research to understand high discontinuation for both covert and overt users.

There are several potential explanations for the findings indicating increased odds of covert use for women in polygynous relationships. Findings in Uganda, Niger, and South Africa highlight the importance of spousal communication in contraceptive use; however, contraceptive communication has rarely been examined within the context of polygynous partnerships<sup>2,12,13</sup>. One explanation is that women who are aware that their husbands have other partners/wives concurrently may hold less trust in the relationship and its stability. An alternative explanation is that there may be less communication about matters of reproductive health and contraceptive use in polygynous relationships, where disclosure may not be a priority and women may be granted more autonomy in decision-making. Given the male partner's limited presence within a single relationship and additional time devoted to competing relationships, the partner may have limited involvement in couple decision-making within each individual relationship, as described by male partners within polygynous partnerships in Kano, Nigeria<sup>14,15</sup>. The polygynous context of partnerships is therefore important to consider when classifying contraceptive decision-making as a "couple decision" as each individual partnership may contribute to reproductive decisions.

Approximately one-third of women had discontinued contraception within a year and another one-third had switched methods. Contrary to our expectations, and qualitative narratives of the difficulties covert users face in sustaining use of contraception secretly<sup>1,2</sup>, we did not observe greater discontinuation and/or switching among covert users compared to overt users. These findings may reflect that women seeking to use contraception covertly are highly motivated to ensure method continuation. Further, results surrounding non-differential discontinuation for contraceptive use status may signal that covert use does not equate to lack of decision-making power within a relationship—rather, it likely encompasses a range of situations, including potential empowerment for women who do not feel the need to seek support from their partners for reproductive decisions<sup>2,15</sup>.

There are several inherent limitations to conducting covert use research, which were similarly encountered in this study. Namely, the low prevalence of covert use limits adequate sample size for analysis, particularly for longitudinal analyses; given these small numbers, we were unable to examine uptake of covert versus overt use over a one-year period, and hope that future research utilizing larger samples and pooled analysis

can address some of these issues. Further, low retention from the parent study limited sample size for longitudinal analysis. The parent study included high loss-to-follow-up as many women moved out of the enumeration areas and were thus ineligible for relocation protocols. While inverse propensity score methods limited biases and differential loss-to-follow up by covert use status was not observed, the sample size was restricted. Lastly, this study utilized the direct measure of covert use—while this measure is likely closest to the truth given reliance on women's reports, it may be an underestimate<sup>5,6</sup>. Though these limitations exist within the current research, this is the first analysis to examine the longitudinal impact of covert use on contraceptive switching and discontinuation. As future rounds of PMA collect these data utilizing a longitudinal panel design, we feel many of the current limitations can be overcome to contribute a fuller understanding of reasons for high contraceptive discontinuation and switching, likely utilizing pooled analyses across contexts.

Taken together, these results indicate that discontinuation and switching were non-differential by overt versus covert use status. Rather, discontinuation and switching were high for both covert and overt users over a one-year period—over thirty percent of both overt and covert users discontinued use while still in need of contraception, putting them at risk of unintended pregnancy. Longitudinal covert use results are largely encouraging and support the fact that covert users maybe be able to overcome obstacles to achieve their reproductive goals; however, high discontinuation rates, regardless of contraceptive status, require concerted focus on women's priorities and circumstances to ensure method continuation if desired by the woman and aligned with her goals. Given the significant proportion of covert users, providers must continue to be aware of covert use and supportive of covert users specific needs to ensure safe, successful contraceptive utilization that maximizes women's reproductive autonomy.

## Data availability

### Underlying data

Quantitative survey data are available for PMA2020 Uganda Round 6 and Round 6 follow-up at the PMA website ([www.pmadata.org](http://www.pmadata.org)). Datasets are free to download and available to public, but users are required to register and provide a description of the proposed research or analysis (<https://www.pmadata.org/data/request-access-datasets>). GPS coordinates are not available for ethical reasons because even after removing directly identifiable information such as names and addresses, participant identity may be difficult to fully conceal, and research locations may remain potentially identifiable, presenting a risk of deductive disclosure.

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