Methodological Innovations for evidencing and estimating the prevalence of traditional contraceptive use in sub-Saharan Africa

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ABSTRACT

An estimated 55 million married women in LMICs use traditional methods of contraception. In sub-Saharan Africa (SSA), traditional methods use is estimated at 4.1% in West and Central Africa and 2.9% in East and Southern Africa. Many demographers have speculated that the actual prevalence of traditional methods in SSA could be higher than the estimates reported in national surveys. Yet, only a few studies have interrogated the actual prevalence of traditional methods in the region. Drawing on recently collected data in four SSA countries, we test various methodological innovations for estimating the true prevalence of traditional methods. The results showed that probing during interviews increased the percentage of women reporting traditional method use. Also, revising the standard approach for estimating contraceptive prevalence increases the percentage reporting traditional method use. The current study demonstrates the need to explore ways of capturing and estimating traditional contraceptive use in national surveys.

BACKGROUND

Traditional methods of contraception (withdrawal and periodic sexual abstinence) played a key role in European fertility decline in the 19th and 20th centuries (Rogow & Horowitz, 1995; Santow, 1993). While the prevalence of modern methods of contraception is higher than traditional methods in low and middle-income countries (LMICs) today, there is still estimated 55 million married women who are using traditional contraceptive methods (Bertrand et al., 2022). In sub-Saharan Africa (SSA), traditional methods use is higher in West and Central Africa (4.1%) than in East and Southern Africa (2.9%) (Bertrand et al., 2022) and the dominant traditional methods are withdrawal and periodic sexual abstinence (Rossier and Corker, 2017). Many demographers have speculated that the actual prevalence of traditional methods in SSA could be higher than the estimates reported in national surveys such the Demographic and Health Survey (DHS) and the Performance Monitoring for Action (PMA) (Marston et al., 2017; Rossier et al., 2014). Yet, only a few studies have interrogated the actual prevalence of traditional methods nor the motivation for their use in the region. Family planning programmes of LMICs have largely ignored traditional methods of contraception. A plausible explanation for the low interest in

traditional methods of contraception could be their lower efficacy in pregnancy prevention relative to modern methods.

Demographers have explained the use of traditional methods in LMICs as a lack of knowledge about modern contraceptives and poor access (Kalipeni & Zulu, 1993; Sharan et al., 2011). Thus, the general assumption has been that women and men using traditional methods would switch to the more effective modern methods once these methods became more accessible (Kopp et al., 2017). Available studies, however, show the persistent use of traditional contraceptive methods by women and couples who are knowledgeable about, and have access to modern methods (Basu, 2005; Gebreselassie et al., 2017; Johnson-Hanks, 2002; Ram et al., 2014; Namasivayam et al., 2023). Fear of side effects, health concerns over some modern methods and ambivalence about the timing of the next pregnancy have been cited as some reasons for use of traditional methods (Ajayi et al. 2018; Madise, 2019), but these may not be the only motivations.

Uncovering the actual prevalence of traditional methods of contraception and the motivations for their use is hampered by methodological and measurement issues. Key among these are the varied definitions and classifications of contraceptive methods over time, across studies and between survey implementers. Hubacher and Trussell (2015) define a modern method(s) as "a product or medical procedure that interferes with reproduction from acts of sexual intercourse". While the authors did not explicitly define traditional methods, they classified any method that is not a product or device as "non-modern". Thus, methods such as Lactational Amenorrhea (LAM) and Standard Days Method (SDM) are considered by these authors as "non-modern" methods, together with withdrawal and periodic sexual abstinence (Hubacher & Trussell, 2015). Module-III of the DHS which was implemented from 1992 to 1998 defined traditional methods to include periodic abstinence or rhythm, withdrawal and LAM (Rutstein & Rojas, 2006). In the latest (2018-2023) DHS module, LAM is considered as a modern method while traditional methods include periodic abstinence or rhythm, withdrawal and country-specific folkloric methods such as herbs, amulets, gris-gris (Croft et al., 2018). The World Health Organisation (WHO), however, restricts the definition of traditional methods to only two contraceptive methods; periodic abstinence or rhythm and withdrawal (Festin et al., 2016). WHO classifies LAM and SDM as modern methods, but does not recognise folkloric methods as contraceptives, citing a lack of scientific basis to demonstrate their effectiveness in pregnancy prevention.

Another methodological challenge is the lack of sufficient probing questions in surveys to produce accurate estimates of traditional contraceptive use (Marston et al., 2017; Rossier et al., 2014). There is evidence that adding follow-up questions in standard surveys to elicit further information about traditional method use increases the percentage of women reporting the use of such methods (Rossier et al., 2014). The study by Rossier et al. in Ouagadougou found that 26% of married women used traditional contraceptives compared to 5% reported in the DHS for the same city. Indeed, the estimation approach used in many national surveys that classifies women who report concurrent use of traditional and modern methods as modern methods users also likely results in the underestimation of traditional methods (Bertrand et al., 2022; Marston et al., 2017).

Given the above methodological and estimation issues, the current paper interrogates the measurement of traditional contraceptive use. We examine how various survey methodological innovations (questionnaire wording, ordering of questions, and questionnaire administration) affect the estimation of traditional contraceptive prevalence in four African countries– Democratic Republic of Congo (DRC), Nigeria, Ghana and Kenya. Specifically, the paper seeks to answer two research questions: (i) Do modifications to standard instruments used in national surveys result in different estimates of traditional contraceptive use? (ii) What sort of modification(s) elicit different information to national surveys (for example: DHS and PMA)?

METHODOLOGY

Study Setting

This paper draws from data from a project, named "*Re-Examining Traditional Method Use: Desperation of Innovation? New Evidence on Traditional Contraceptive Methods in DRC, Ghana, Kenya and Nigeria"* or "*TEAM-UP"* for short. In each of the four countries, two sites were selected. Collectively, the eight sites span: (i) communities with high traditional methods prevalence (tCPR) (> 10%) and low traditional methods prevalence (< 5%); (ii) sites on a spectrum of high modern contraceptive prevalence (mCPR) (> 40%) and low mCPR (<30%); and iii) large cities as well as rural areas. The reproductive profiles of the four countries also differ in many ways, reflecting the different stages of the fertility transition in the region (see Table 1).

Table 1: Population, contraceptive use and fertility in study countries and sites

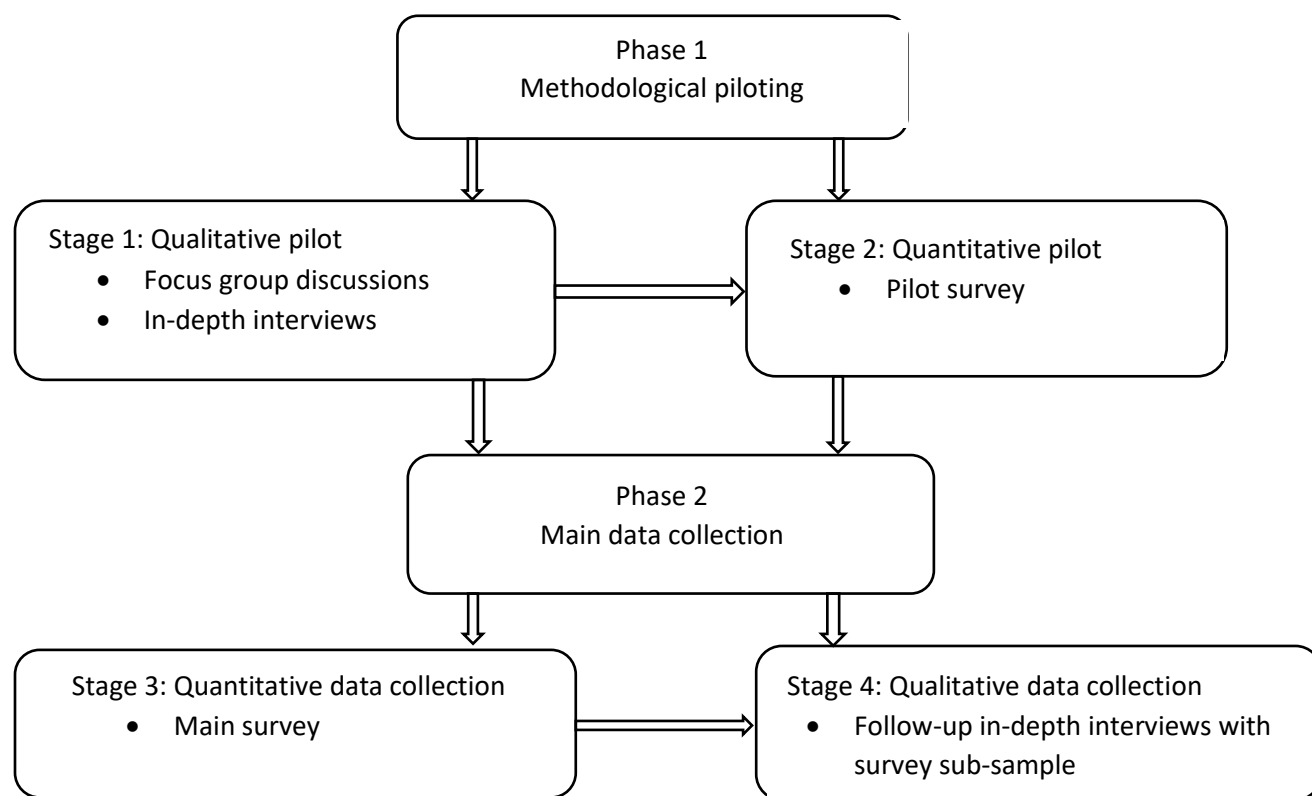| Country	Population circa 2022 (millions)	TFR	tCPR (%)	mCPR (%)	Site	tCPR (%)	mCPR (%)	TFR
DRC	102.3	6.2	11.6	18.0	Kinshasa	25.7	19.0	4.2
					Mai-Ndombe*	8.1	17.9	6.3
Nigeria	223.8	5.3	4.6	12.0	Adamawa	6.9	18.2	6.1
					Lagos	20.3	29.1	3.4
Ghana	34.1	3.9	8.5	27.8	Greater Accra	8.3	23.8	2.7
					Ashanti	12.3	32.1	3.5
Kenya	55.1	3.4	5.6	56.9	Makueni	8.9	64.4	3.3
					Mombasa	4.6	42.1	2.9

*Rates for Bundundu province which Mai-Ndombe was formally part of

Nigeria and DRC are in the early stages of fertility transition, characterised by high fertility and low contraceptive use. DRC has one of the highest percentage of women using traditional method(s) in SSA, with prevalence in some provinces including Kinshasa exceeding modern method use. In Nigeria, there is wide variation in contraceptive use across states and geopolitical zones. For instance, tCPR ranges from 0.5% in the North West to 15.2% in the South East while mCPR ranges from 6.2% in the North West to 24.3% in the South West. Kenya and Ghana, on the other hand, are forerunners of fertility decline in SSA, with TFR currently estimated at 3.9 and 3.4 respectively. These two countries, however, have different contraceptive use profiles. Kenya has one of the highest prevalence of modern contraceptive use while Ghana has achieved a fertility level similar to Kenya with half the modern contraceptive prevalence rate. The diversity in the settings of the TEAM-UP project was important to test the effects of the various methodological innovations in diverse contexts in SSA.

Study design

The TEAM-UP project collected qualitative and quantitative data in two phases, and this occurred between May 2021 and March 2023. The stages of data collection across the two phases are summarised in figure 1 below.

Figure 1. Flow chart of TEAM-UP study design

Phase 1
Methodological piloting

Stage 1: Qualitative pilot
- Focus group discussions
- In-depth interviews

Stage 2: Quantitative pilot
- Pilot survey

Phase 2
Main data collection

Stage 3: Quantitative data collection
- Main survey

Stage 4: Qualitative data collection
- Follow-up in-depth interviews with survey sub-sample

Source: TEAM-UP Project, 2022/23

Phase 1: Methodological piloting

Methodological pilot studies are used in social science research to gain insights including respondents' understandings of questions, the effects of data collection procedures, sampling procedures and the reliability of measures (Smith, 2019). The methodological pilot study of the TEAM-UP project involved qualitative and quantitative pilots. The qualitative pilot occurred first in the sequence of data collection, and the objective was to understand the labels, terminologies and words used to describe traditional methods of contraception in the study sites. The qualitative pilot involved interviews with key informants (women using traditional methods, reproductive health nurses and community women leaders) and focus group discussions with key segments (younger unmarried women and men, older married women and men, older unmarried women and men) of the population in each site.

The information generated by the qualitative pilot helped to inform the development of questionnaires for the quantitative pilot. Specifically, the terminologies and words used by participants to describe various contraceptive methods were incorporated into the description of such methods in the pilot questionnaire during. For example, the description of injectables in the pilot questionnaire for probing is as follow: "women can have an injection by a health worker or *self-administered* to prevent pregnancy". Self-administration of injectables was recently approved by WHO (WHO 2020) and was mentioned by participants in the qualitative. Previous standard survey questionnaires did not have the benefit of including this in their description of injectables. Also, the qualitative pilot provided information for the description of various folkloric methods in the pilot questionnaire. For instance, the description of concoctions in the main questionnaire was derived from descriptions that women gave during the methodological pilot: "*a combination of various ingredients, including herbs, spices, pharmaceutical products, condiments or powdery substances dissolved, milled or mixed up together that a person may drink, insert into the body or apply externally on body parts to prevent pregnancy*". Standard survey questionnaires such as DHS and PMA do not include the description of folkloric and other traditional methods.

Guided by the results of the qualitative pilot and reviews of existing questionnaires such as those for DHS and PMA surveys, we developed two questionnaires to test the effect of changes in questionnaire content and administration approach on estimates of traditional and modern contraceptive use. Version A of the questionnaire largely followed the format of standard surveys such as DHS and PMA with few modifications, while version B was the experimental instrument, and incorporated major modifications and innovations (see Appendix 1 for key features of the pilot questionnaires). The main difference between the two questionnaires was the order/sequence of probing for traditional and modern methods after respondents had spontaneously mentioned the methods they used. It is important to note that the order of probes in standard survey questionnaires such as DHS and PMA proceed from modern to traditional methods. The sequence of probing using questionnaire A followed this standard format while questionnaire B started probing for traditional contraceptives before modern methods. We reversed the order of probing in questionnaire B because of the salience of traditional methods to the TEAM-UP project. By reversing the order of probing in version B, we sought to reduce the magnitude of underreporting of traditional methods resulting from interviewers not considering these methods salient enough to probe sufficiently.

Sample for methodological pilot survey

The sample for the methodological pilot survey was women from households selected randomly in the study sites. The households were drawn from the most recent Census/Survey Sampling Frame for the study site. Eligible respondents were women of reproductive age (15-49 years) who were usual residents of the selected household. Only one eligible respondent in the selected household was interviewed, and eligible respondents were interviewed with only one version of the questionnaire (A or B). A minimum of 45 eligible women were targeted to be interviewed with each questionnaire in each site. Thus, a minimum target of 90 interviews were expected with the two questionnaires in each site. To achieve this minimum target, we over sampled by 15 respondents for each questionnaire, making it 60 eligible women per questionnaire per site. A total of 918 eligible women were interviewed across the four countries, averaging 230 interviews per country. The socio-demographic characteristics of women who responded to the questionnaires were similar, thus providing a sound basis for comparing contraceptive estimates from the two questionnaires (see Table 2).

Table 2. Characteristics of respondents in the methodological pilot survey

Socio-demographic Characteristics	Version A (n=467)	Version B (n=451)
Age (mean)	29.1	29.5
Children Ever Born (mean)	3.3	3.3
Marital status	%	%
Never married	34.7	32.6
Currently married	58.2	57.9
Separated/Divorced	5.8	6.9
Widowed	1.3	2.7
Educational attainment	%	%
No education	3.2	4.4
Primary	27.2	25.7
Post-Primary/Voc.	19.5	17.9
Secondary	37.4	40.0
Post-Secondary	12.7	12.0
Employment	%	%
Yes	47.3	45.9
No	52.7	54.1
Religion	%	%

| Socio-demographic Characteristics	Version A (n=467)	Version B (n=451)
Age (mean)	29.1	29.5
Children Ever Born (mean)	3.3	3.3
No religion	1.5	0.7
Catholic	10.5	13.8
Protestant	20.6	21.7
Pentecostal	44.5	38.6
Other Christian	4.3	4.4
Muslim	17.1	19.3
Other religion	1.5	1.5
Residence	%	%
Rural	41.5	39.7
Urban	52.0	51.7
Peri-Urban	6.4	8.7
Country	%	%
DRC	25.9	24.8
Ghana	25.5	24.2
Kenya	22.5	23.7
Nigeria	26.1	27.3

Source: TEAM-UP Methodological Pilot Survey, 2021

Results of pilot survey and instrument revision for main survey

The results of the methodological pilot survey informed the choice of which version of the pilot instrument to field in the main survey. Overall, results of the methodological pilot survey (figure 1) showed that the percentage of women using traditional contraceptive methods in the two versions of the questionnaire was the same (7.1%). This suggests that ordering of questions in pilot questionnaire, with traditional methods being first, had no impact on the reporting of traditional methods. However, concurrent use of traditional and modern methods was higher in version B than A after probing and accounting for method concurrency. Also, version B of the questionnaire showed a higher percentage of women (29.1%) using modern contraceptives use than version A (25.7%). Given these results, the project team settled on version B of the questionnaire for revision for the main survey.

Figure 1: Percentage of women using traditional and modern methods in the two versions of the pilot instrument.
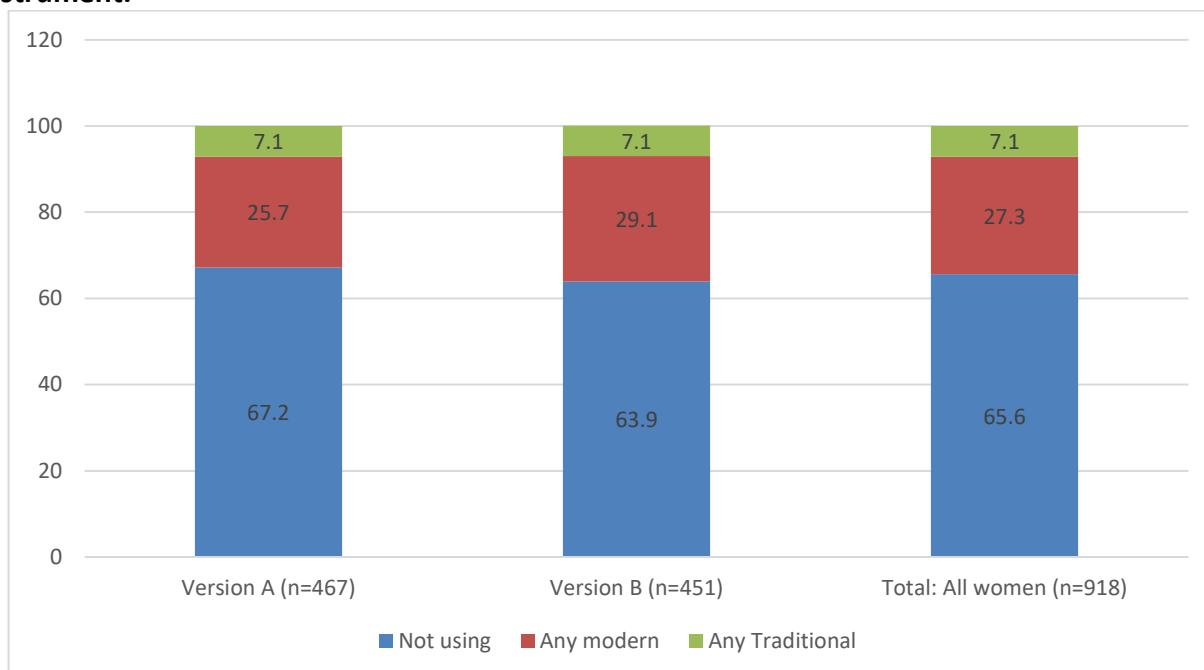
The TEAM-UP consortium organised two workshops to review and revise version B of the pilot instrument for the main survey. The first workshop took place in Accra (Ghana) from 21st to 25th March 2022 while the second occurred in Lilongwe (Malawi) from 8th to 12th May 2022. One of the key revisions was the change in the wording of the question on contraceptive use. Current contraceptive use in the pilot survey was elicited by two interrelated questions: (a) *In the last four weeks, did you or your partner(s) do anything deliberately to try to delay or avoid getting pregnant?* and (b) *which method(s) did you use in the last four weeks to try to delay or avoid getting pregnant?* The wording in these two questions were revised as follows: (a) *Between now and the last one month, did you or your partner do anything or try in any way to delay or avoid getting pregnant?* and (b) *What did you or your partner do in the last one month to delay or avoid getting pregnant?* The words "method" and "use" in the pilot instrument were omitted from the final survey instrument because of the potential risk of priming respondents to focus on modern methods in their responses.

Another modification to the final survey instrument was the inclusion of other possible strategies women or couples may rely on to delay or avoid getting pregnant. The list of contraceptives in standard survey instruments often includes modern (sterilisation, condoms, pills, injectables, implants, etc.), traditional   (withdrawal and rhythm) and other traditional (folk methods such as charms, concoctions,

herbs etc.). In addition to these, we included other possible strategies women or couples may rely on to delay or avoid pregnancy: masturbation, oral sex, anal sex, intercrural sex, use of sex toys etc. While we do not consider these as contraceptives, they may be part of the repertoire of "ways or things" women and couples do to delay or avoid pregnancy.

Training for the main survey

Given the salience of wording in the questionnaire, we developed a training manual to guide the training of fieldworkers across the project countries. Fieldworkers were particularly trained to use the wording of the final instrument during interviews while avoiding terms such as methods which have been used in standard surveys. Fieldworkers were trained to do on the spot translation of questions from English or French in DRC, to the appropriate local language during interviews. Interviews in DRC were mainly conducted in Lingala while Yoruba and Hausa were the main languages of interview in Nigeria. In Ghana, interviews were mainly conducted in Ga, Dangme, Ewe and Asante Twi while Swahili and Kamba were the main languages of interview in Kenya.

Phase 2: Sampling and sample size of main survey

The TEAM-UP project used a gridded population sampling technique to generate sample frames (enumeration areas) for all the sites since some of the countries did not have recent census sampling frames. The number of enumeration areas (EAs) required in each site were then randomly selected from the list of EAs. A field-based mapping and listing of all households in the selected EAs was conducted. Households were then selected from the list generated by field mapping and listing exercises using random number generators. All women of reproductive age (15-49 years) who were usual residents of the selected households were eligible to be interviewed, unless they declined or were absent after several visits. A total of 13,761 women from 10,141 households were eligible to be interviewed; of which 106 women refused to participate in the survey while five interviews could not be completed after consent was obtained. Therefore, complete interviews were conducted with 13,650 eligible women. Out of the 13,650 women, a total of 7,964 (representing 58%) women across the four countries were currently married or living with a partner. This paper analysed data from these 7,964 women. The data was weighted for accurate representation of each site.

Ethical approval for both the pilot and main surveys were granted by review boards in the four countries. In Kenya, approval was granted by AMREF Ethics and Scientific Review Committee (Ref #:

AMREF–ESRC P945/2021) and the National Commission for Science, Technology and Innovation (License #: NACOSTI/P/21/10530). Approval in Nigeria was granted by the National Health Research Ethics Committee of Nigeria (Approval #: NHREC/01/01/2007-15/03/2021). In DRC, the study was approved under No.259/CNES/BN/PMMF/2021 du 1 er /06/2021. In Ghana, the Ethics Committee for the Humanities (ECH) at the University of Ghana approved the study.

Data analysis and measurement approach

We estimated the percentage of married women using contraceptives; tCPR being the percentage of married women using traditional method(s) and mCPR being the percentage using any modern method(s). We used two estimation approaches to calculate the prevalence of traditional and modern methods for the same dataset. The first was the standard approach for estimating contraceptive prevalence in surveys such as DHS, MICS and PMA which prioritises method efficacy when classifying women as traditional or modern method users. Using this approach, a woman using both a contraceptive pill and withdrawal is classified as a modern method user on the basis that pills are more efficacious in pregnancy prevention than withdrawal. The main weakness of this approach is the potential to underestimate the prevalence of traditional methods, particularly in settings where simultaneous use of traditional and modern methods is high. To address this methodological gap, we applied a second estimation approach which accounted separately for concurrent traditional and modern method use. In this estimation approach, women using only modern method(s), those using only traditional method(s) and those using concurrent traditional and modern method(s) were classified into three exclusive groups. Results of the two approaches were compared to show the extent of underestimation or overestimation of traditional and modern methods when using standard estimation approaches.

RESULTS

Background characteristics of respondents in main survey

Table 3 presents a description of the study sample for the main survey. Overall, a lower percentage of the women were aged 15-19 years (average= 3.2%; range from 1.7% in Kenya to 5.8% in DRC). This was expected since the analysis was constrained to women who were married or cohabiting. Majority of the women across all the countries had secondary or higher education, except Kenya where only 48% reported having secondary or higher education. In Kenya, we chose Mombasa, which though urban has

lower female education levels relative to the more cosmopolitan Nairobi city. Nearly half (45%) of the women were resident in urban areas The Ghana sample had majority living in rural areas. Close to a third (31%) of the sample were nulliparous while about 11% had five or more children. About 6 in 10 of the women intended to have a child/another child whereas almost a third of them did not want more children.

[Table 3 about here]

Prevalence of traditional and modern methods by country

Table 4 presents the prevalence of traditional and modern methods by country. Overall, using the standard estimation approach and based on methods spontaneously mentioned by respondents during interviews, the percentage of married/cohabiting women using traditional methods (withdrawal and rhythm) was 7.4% while modern method use was about 30%. The percentage using other traditional or folkloric methods was 1.5%. Thus, the percentage using any traditional method(s) in the four countries was about 9%. When the standard estimation approach is revised to account for concurrent traditional and modern method use separately, we observed that 2.4% of the women classified as modern method users in the standard estimation approach also used traditional methods. Based on the spontaneous responses in each country and using the standard estimation approach, we found that the highest percentage of traditional method use was in Nigeria (12%) followed by DRC (9.1%). The percentage using traditional methods from spontaneous responses in Ghana was 4.3% while in Kenya it was 3.8%. Revising the estimation approach to account for concurrent traditional and modern method use separately, we found that 3.4% and 3.3% of modern method users in DRC and Nigeria respectively also used traditional methods. Only 0.7% of women in Kenya reported concurrent traditional and modern methods.

To examine the effect of more thorough probing, we recalculated the percentage of women using traditional and modern methods after accounting for the additional methods mentioned after probing. The results showed that probing increased the percentage of women using traditional methods by about 2 percentage points, that is from 7.4% before probing to 9.1% after probing. Probing also significantly increased the percentage using any modern method(s), from 29.7% before probing to 35.5%. However, probing did not result in an increase in the percentage of women reporting the use of other traditional or folkloric methods. Using the entire list of contraceptives mentioned by respondents after probing and revising the estimation approach to take into account concurrent method use, we found that 7.6% of

the women classified as modern method users also used traditional methods. Thus, probing increased the percentage of women reporting concurrent traditional and modern method use from 2.4% to 7.6%.

[Table 4 about here]

Analysing the effect of probing and revision in estimation approach across the four countries revealed some patterns and differences. Probing increased the percentage using traditional methods in all four countries, although by different amounts (0.8% in Kenya, 1.2% in Ghana, 1.6% in Nigeria and 3% in DRC). Probing had a greater effect in increasing the percentage of women reporting modern method use than traditional method use across all the countries. Probing increased the percentage of women reporting modern method use in DRC by about 76%, from 16.2% before probing to 28.5%. More modest increases in mCPR after probing were observed in the other countries: 4 percentage points in Ghana and Nigeria, and about 2% in Kenya. Accounting for method concurrency showed that a sizable percentage of modern methods users in DRC (11.5%), Ghana (8.8%) and Nigeria (7.0%) also used traditional method(s). This meant that the percentage of women using any traditional method(s), regardless of whether they also used a modern method or not, was 25.1% in DRC, 23.6% in Nigeria, 15% in Ghana and 9.2% in Kenya.

Prevalence of traditional and modern methods by site in each country

For a more nuanced understanding of the effect of various innovations tested in this paper in diverse contexts, we disaggregated the prevalence of contraceptive use by site (Table 5). The results show similarities and differences within and across sites. Based on the spontaneous responses and using the standard estimation approach, the percentage of married women using traditional method(s) was highest in Lagos, Nigeria (14.6%) followed by Mai-Ndombe (9.9%) and Kinshasa (8.9%) in DRC. The percentage (7.7%) using traditional methods in rural Greater Accra region (Ghana) was higher than the remaining sites including urban Ashanti (Ghana), the two Kenya sites and Adamawa (Nigeria). Rural Greater Accra had the highest percentage (4.8%) of women concurrently using traditional and modern methods, followed closely by Lagos (4%), Mai-Ndombe (3.5%) and Kinshasa (3.4). Concurrent traditional and modern method use based on the methods spontaneously mentioned by respondents was lowest in Adamawa, Mombasa, Makueni and urban Ashanti.

[Table 5 about here]

Probing doubled the percentage of women that reported using traditional methods in urban Ashanti (Ghana), from 1.8% before probing to 3.5% after. Probing increased the prevalence of traditional methods by about 4% in Mai-Ndombe, approximately 3% in Kinshasa and almost 2% in Lagos. Probing also significantly increased the percentage of women that reported using modern methods. For example, the percentage that reported using modern methods in Adamawa (Nigeria) increased from 7.6% based on the spontaneous responses to 16.6% after probing. Reporting of use of modern methods in Kinshasa also increased significantly from 18.2% to 32.4% after probing. When the standard estimation approach is revised to account separately for women that report using both traditional and modern methods, we find that more than half of the women categorised as modern method users also used traditional methods. Using the revised estimation approach revealed that nearly a quarter (24.5%) of married women in rural Greater Accra reported using any traditional method(s). This includes users of traditional methods only and concurrent traditional and modern methods users.

Prevalence of other pregnancy avoidance strategies

One of the innovations of the TEAM-UP instrument was the inclusion of other ways, things or sexual strategies women or couples may use to delay or avoid pregnancy. These included masturbation, oral sex, anal sex, intercrural sex, use of sex toys etc. Even though we do not consider these strategies as contraceptives, we deemed it important to understand the extent to which women and couples included them as part of their repertoire of strategies for avoiding pregnancy. Overall, we found that the reported use of such methods was low across all the four countries, ranging from 1% in Kenya to 5% in DRC.

 [Table 6 about here]

DISCUSSION

The paper examined the effect of methodological innovations in survey design on estimates of traditional contraceptive use in four African countries. The results showed that probing, by describing the methods to respondents, increased the reporting of both traditional and modern method use in the surveys. In general, probing increased the prevalence of traditional methods by about 2% while modern methods increased by around 5%. The order of probing for methods did not seem to affect estimates of traditional and modern method use. This suggests that probing for traditional methods before modern methods in surveys does not affect the reporting of modern methods. The findings are consistent with

the results of an experimental study in Peru which showed that reversing the order of probes does not affect estimates of contraceptive knowledge and current use (Goldman et al., 1989).

Even though probing generally increased the reporting of modern methods by a higher percentage than traditional methods, reporting of traditional method use was higher than modern methods after probing in some of the sites. For example, the percentage of women reporting traditional methods after probing nearly doubled in urban Ashanti (Ghana). In Mai-Ndombe (DRC), traditional method use increased from about 10% to 14% after probing while reporting of modern methods increased from 6% to 9%. This finding is consistent with the results of previous studies in Accra (Ghana) and Ouagadougou (Burkina Faso) (Marston et al., 2017; Rossier et al., 2014). The study in Ouagadougou found that adding follow-up questions to elicit further information about the use of methods such as periodic abstinence and withdrawal significantly increased their reporting. Marston et al., found that women rarely spontaneously mention withdrawal and rhythm in surveys, as they assume such methods to be the baseline contraceptives for every woman.

The observed increase in the percentage of women reporting modern methods use after probing in the our study was surprising given that the few studies that found adding follow-up questions on traditional method use to increase prevalence of such methods did not show a commensurate increase in modern contraceptive prevalence (Rossier et al., 2014). Specifically, the study of Rossier et al., which added specific questions to probe for the use of natural contraceptive methods (withdrawal, periodic abstinence, LAM and SDM) in Ouagadougou found that 26% of women used such methods compared to 5% in the DHS for the same city. The prevalence of modern methods in this study was, however, the same as the DHS after probing implying that modern methods are less likely to be affected by significant underreporting and thus do not require probing. The current study, however, shows that modern methods may be affected by more underreporting than traditional methods and that without adequate probing, estimates for mCPR may be lower than the reality. Indeed, the prevalence of modern methods in Kinshasa (DRC) increased from 18.2% based on spontaneous responses to 32.4% after probing; this is higher than recent estimates by the PMA2020 (27.4%) (Tulane University School of Public Health et al., 2018). The increased reporting of modern methods after probing may be driven by the use of condoms and emergency contraceptive pills (ECP) on ad hoc basis, which women may not consider worth mentioning without being prompted or probed. The tendency to underreport ECP use might be explained in part by stigma avoidance in contexts where ECP is conflated with medication abortion. The

significant increase in modern methods use in Adamawa after probing (7.6% to 16.6%) might be explained by women in more conservative societies using such methods covertly. , meaning that additional probing might be more likely to yield reports of higher usage.

The current study suggests that part of the reason for the underestimation of traditional methods from surveys such as DHS and PMA is the estimation approach which focuses on the single most effective method used by a woman. The standard approach for estimating current contraceptive use does not allow for the capture of women using traditional and modern methods concurrently. Such women are classified as modern method users, on the basis that the modern method is their most effective method. The impact of this approach in underestimating traditional method is much higher in settings where the concurrent use of traditional and modern methods is common. For example, we found that 15% of women in rural Greater Accra (Ghana) used modern and traditional methods concurrently compared to about 14% using only modern methods. This finding is consistent with the results of a qualitive study in Accra which shows that women rely on a variety of method combinations depending on their circumstance to prevent pregnancy (Marston et al., 2017).

Finally, the study revealed lower use of other sexual strategies to prevent pregnancy in all four countries. We observed that Kenya, which had the highest prevalence of modern method use among the four countries, reported the lowest percentage of women using these alternative strategies. DRC and Nigeria on the other hand reported some usage of these strategies, relative to Kenya and Ghana. In settings with low/er preference for modern methods and / or more limited access to modern methods, it is possible that such sexual strategies form an important component of people's pregnancy avoidance.

CONCLUSION

The results of the methodological innovations tested in the current study have implications for the design of surveys about contraception in particular, and pregnancy avoidance in general. While the addition of new questions to follow-up on specific methods may not be desired in surveys such as DHS given the already lengthy questionnaire, our evidence suggests that probing more thoroughly may increase reports of contraceptive use without having to introduce new questions in current questionnaire designs. The current study also demonstrates the need to explore ways of capturing various method combinations, particularly the combination of traditional and modern methods, in national surveys. Related to this is the need to revise estimation approaches surveys such as DHS, PMA and other small-scale studies in order to report the level of current use of modern and traditional

methods. Our aim in doing this methodological work is to stimulate further discussion and innovation in survey questionnaire design to better reflect the realities of what people do to prevent pregnancy. Motivations for the use of traditional methods or concurrent use of modern and traditional methods will be reported in subsequent papers from the project.

Table 3. Percent distribution of married women by selected background characteristics in study countries

Characteristic	DRC N = 2,078	Ghana N = 1,448	Kenya N = 2,341	Nigeria N = 2,097	Overall N = 7,964
Age	N (%)	N (%)	N (%)	N (%)	N (%)
15-19yrs	120 (5.8)	56 (3.9)	40 (1.7)	42 (2.0)	257 (3.2)
20-24yrs	375 (18.0)	225 (15.5)	476 (20.3)	197 (9.4)	1,272 (16.0)
25-29yrs	458 (22.1)	270 (18.6)	622 (26.5)	351 (16.8)	1,701 (21.4)
30-34yrs	372 (17.9)	307 (21.2)	429 (18.3)	408 (19.5)	1,516 (19.0)
35-39yrs	393 (18.9)	271 (18.7)	370 (15.8)	489 (23.3)	1,522 (19.1)
40-44yrs	212 (10.2)	191 (13.2)	241 (10.3)	364 (17.4)	1,008 (12.6)
45-49yrs	148 (7.1)	128 (8.8)	165 (7.0)	245 (11.7)	687 (8.6)
Education					
None	113 (5.5)	281 (19.4)	114 (4.8)	198 (9.4)	706 (8.9)
Primary	249 (12.0)	372 (25.7)	1,101 (47.0)	271 (12.9)	1,992 (25.0)
Secondary/Higher	1,716 (82.6)	795 (54.9)	1,127 (48.1)	1,628 (77.6)	5,266 (66.1)
Residence					
Rural	567 (27.3)	1,127 (77.9)	536 (22.9)	480 (22.9)	2,710 (34.0)
Urban	1,238 (59.6)	298 (20.6)	1,001 (42.7)	1,062 (50.6)	3,599 (45.2)
Peri-urban	273 (13.2)	22 (1.5)	804 (34.4)	555 (26.5)	1,655 (20.8)
Religion					
Catholic	262 (12.6)	52 (3.6)	373 (15.9)	90 (4.3)	777 (9.8)
Protestant	223 (10.7)	184 (12.7)	590 (25.2)	163 (7.8)	1,160 (14.6)

Characteristic	DRC N = 2,078	Ghana N = 1,448	Kenya N = 2,341	Nigeria N = 2,097	Overall N = 7,964
Pentecostal	307 (14.8)	619 (42.7)	576 (24.6)	438 (20.9)	1,940 (24.4)
Other Christian	992 (47.8)	360 (24.9)	216 (9.2)	541 (25.8)	2,109 (26.5)
Muslim	15 (0.7)	184 (12.7)	561 (24.0)	855 (40.8)	1,615 (20.3)
None/Other	278 (13.4)	49 (3.4)	25 (1.1)	10 (0.5)	363 (4.6)
Parity					
0 Children	682 (32.8)	614 (42.4)	559 (23.9)	615 (29.3)	2,471 (31.0)
1 Child	345 (16.6)	165 (11.4)	513 (21.9)	280 (13.4)	1,304 (16.4)
2 Children	336 (16.1)	158 (10.9)	516 (22.1)	390 (18.6)	1,399 (17.6)
3 Children	264 (12.7)	149 (10.3)	385 (16.4)	378 (18.0)	1,175 (14.8)
4 Children	184 (8.9)	125 (8.6)	206 (8.8)	242 (11.5)	758 (9.5)
≥5 Children	267 (12.8)	237 (16.4)	162 (6.9)	192 (9.2)	858 (10.8)
Fertility Intention					
Have another	1,357 (65.3)	856 (59.1)	1,490 (63.6)	1,189 (56.7)	4,892 (61.4)
No more	530 (25.5)	442 (30.5)	762 (32.5)	803 (38.3)	2,538 (31.9)
Undecided	190 (9.2)	150 (10.3)	90 (3.8)	105 (5.0)	534 (6.7)
Site					
Kinshasa	1,744 (84.0)	NA?			1,744 (84.0)
Mai-Ndombe	333 (16.0)				333 (16.0)
Ashanti		842 (58.2)			842 (58.2)
Greater Accra		606 (41.8)			606 (41.8)

Characteristic	DRC N = 2,078	Ghana N = 1,448	Kenya N = 2,341	Nigeria N = 2,097	Overall N = 7,964
Makueni			648 (27.7)		648 (27.7)
Mombasa			1,693 (72.3)		1,693 (72.3)
Lagos				1,643 (78.3)	1,643 (78.3)
Adamawa				454 (21.7)	454 (21.7)

Source: TEAM-UP Main Survey, 2022/23

Table 4. Percent distribution of married women by contraceptive method currently used in the four countries

Estimation Approach	DRC N = 2,078	Ghana N = 1,448	Kenya N = 2,341	Nigeria N = 2,097	Overall N = 7,964
Before probing					
Standard Approach					
Any Modern	337 (16.2)	336 (23.2)	1,275 (54.4)	421 (20.1)	2,369 (29.7)
Traditional	188 (9.1)	62 (4.3)	89 (3.8)	251 (12.0)	590 (7.4)
Other traditional /Folkloric	36 (1.7)	3 (0.2)	18 (0.8)	59 (2.8)	116 (1.5)
Not Using	1,517 (73.0)	1,046 (72.3)	960 (41.0)	1,365 (65.1)	4,888 (61.4)
TEAM-UP Approach					
Concurrent Traditional/Modern	72 (3.4)	36 (2.5)	16 (0.7)	69 (3.3)	192 (2.4)
(Any) Modern Only	265 (12.8)	300 (20.8)	1,259 (53.8)	352 (16.8)	2,177 (27.3)
(Any) Traditional Only	224 (10.8)	65 (4.5)	107 (4.6)	310 (14.8)	707 (8.9)

Estimation Approach	DRC N = 2,078	Ghana N = 1,448	Kenya N = 2,341	Nigeria N = 2,097	Overall N = 7,964
Not using	1,517 (73.0)	1,046 (72.3)	960 (41.0)	1,365 (65.1)	4,888 (61.4)
After Probing					
Standard Approach					
Any Modern	593 (28.5)	396 (27.3)	1,329 (56.7)	507 (24.2)	2,824 (35.5)
Only Traditional	252 (12.1)	80 (5.5)	107 (4.6)	286 (13.6)	724 (9.1)
Other Traditional/Folkloric	32 (1.5)	10 (0.7)	19 (0.8)	63 (3.0)	123 (1.5)
Not Using	1,201 (57.8)	962 (66.4)	888 (37.9)	1,241 (59.2)	4,292 (53.9)
TEAMUP Approach					
Concurrent Traditional/Modern	239 (11.5)	127 (8.8)	89 (3.8)	148 (7.0)	602 (7.6)
(Any) Modern Only	354 (17.0)	269 (18.6)	1,240 (53.0)	360 (17.2)	2,223 (27.9)
(Any) Traditional Only	284 (13.6)	90 (6.2)	125 (5.4)	349 (16.6)	848 (10.6)
Not using	1,201 (57.8)	962 (66.4)	888 (37.9)	1,241 (59.2)	4,292 (53.9)

Source: TEAM-UP Main Survey, 2022/23

Table 5. Percent distribution of married women according to contraceptive method currently used by site

Estimation Approach	Kinshasa N = 1,744	Mai-Ndombe N = 333	Ashanti N = 842	Greater Accra N = 606	Makueni N = 648	Mombasa N = 1,693	Lagos N = 1,643	Adamawa N = 454	Overall N = 7,964
Before probing									
Standard Approach									
Any Modern	318 (18.2)	19 (5.6)	197 (23.4)	140 (23.0)	404 (62.4)	870 (51.4)	387 (23.5)	35 (7.6)	2,369 (29.7)
Traditional	155 (8.9)	33 (9.9)	15 (1.8)	47 (7.7)	38 (5.9)	51 (3.0)	240 (14.6)	11 (2.4)	590 (7.4)
Other/Folkloric	34 (1.9)	2 (0.6)	2 (0.2)	2 (0.3)	1 (0.1)	17 (1.0)	54 (3.3)	5 (1.1)	116 (1.5)
Not Using	1,237 (70.9)	280 (83.9)	628 (74.6)	418 (69.0)	205 (31.6)	755 (44.6)	962 (58.5)	404 (88.8)	4,888 (61.4)
TEAM-UP Approach									
Concurrent Use	60 (3.4)	12 (3.5)	7 (0.8)	29 (4.8)	4 (0.7)	11 (0.7)	66 (4.0)	3 (0.6)	192 (2.4)
Modern Only	258 (14.8)	7 (2.1)	190 (22.6)	110 (18.2)	400 (61.7)	859 (50.7)	320 (19.5)	32 (7.1)	2,177 (27.3)
Traditional Only	189 (10.8)	35 (10.6)	17 (2.0)	48 (8.0)	39 (6.0)	68 (4.0)	294 (17.9)	16 (3.5)	707 (8.9)
Not using	1,237 (70.9)	280 (83.9)	628 (74.6)	418 (69.0)	205 (31.6)	755 (44.6)	962 (58.5)	404 (88.8)	4,888 (61.4)
After Probing									
Standard Approach									
Any Modern	565 (32.4)	28 (8.5)	220 (26.1)	176 (29.0)	431 (66.5)	898 (53.0)	432 (26.3)	76 (16.6)	2,824 (35.5)
Only Traditional	206 (11.8)	46 (13.8)	29 (3.5)	51 (8.4)	47 (7.2)	60 (3.5)	268 (16.3)	18 (3.9)	724 (9.1)
Other/Folkloric	30 (1.7)	2 (0.6)	4 (0.5)	6 (0.9)	1 (0.2)	17 (1.0)	53 (3.2)	10 (2.2)	123 (1.5)

Estimation Approach	Kinshasa N = 1,744	Mai-Ndombe N = 333	Ashanti N = 842	Greater Accra N = 606	Makueni N = 648	Mombasa N = 1,693	Lagos N = 1,643	Adamawa N = 454	Overall N = 7,964
Not Using	944 (54.1)	257 (77.1)	589 (69.9)	373 (61.6)	169 (26.1)	718 (42.4)	890 (54.2)	351 (77.3)	4,292 (53.9)
TEAM-UP Approach									
Concurrent Use	219 (12.6)	19 (5.8)	35 (4.2)	91 (15.1)	14 (2.2)	75 (4.4)	127 (7.7)	21 (4.6)	602 (7.6)
Modern Only	345 (19.8)	9 (2.7)	184 (21.9)	84 (13.9)	417 (64.3)	823 (48.6)	305 (18.6)	55 (12.0)	2,223 (27.9)
Traditional Only	236 (13.5)	48 (14.4)	34 (4.0)	57 (9.4)	48 (7.4)	77 (4.6)	321 (19.5)	28 (6.1)	848 (10.6)
Not using	944 (54.1)	257 (77.1)	589 (69.9)	373 (61.6)	169 (26.1)	718 (42.4)	890 (54.2)	351 (77.3)	4,292 (53.9)

Source: TEAM-UP Main Survey, 2022/23

Table 6. Percent distribution of married women using other pregnancy avoidance strategies by country

Characteristic	DRC N = 2,078	Ghana N = 1,448	Kenya N = 2,341	Nigeria N = 2,097	Overall N = 7,964
Other strategies					
No	1,973 (94.9)	1,385 (95.7)	2,317 (98.9)	2,002 (95.5)	7,676 (96.4)
Yes	105 (5.1)	62 (4.3)	25 (1.1)	95 (4.5)	287 (3.6)

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Appendix 1 for key features of the pilot questionnaires

Questionnaire A	Questionnaire B
Section 1: Background information • Age, education, religion, residence etc. • Marital status and reproductive history	Section 1: Background information • Age, education, religion, residence etc. • Marital status and reproductive history
Section 2: Contraceptive knowledge • Information about various contraceptive methods and sources of such information. • Probing for information about methods not mentioned by respondents spontaneously during interviews, starting with modern methods.	Section 2: Contraceptive knowledge • Information about various contraceptive methods and sources of such information. • Probing for information about methods not mentioned by respondents spontaneously during interviews, starting with traditional methods.
Section 3: Current contraceptive use • Sexual activity and contraceptive use in the last four weeks (one month). • Probing for methods not mentioned by respondents by providing a detailed description of such methods, and then asking whether respondents had used the method in the last four weeks. • The order/sequence of probing for contraceptive use started with modern methods before traditional methods.	Section 3: Current contraceptive use • Sexual activity and contraceptive use in the last four weeks (one month). • Probing for methods not mentioned by respondents by providing a detailed description of such methods, and then asking whether respondents had used the method in the last four weeks. • The order/sequence of probing for contraceptive use started with traditional methods before modern methods.
Section 4: Ever use of contraceptives • Contraceptive use at any time before the last one month. • Probing for methods used at any time before the last one month, starting with modern methods. • Age at first contraceptive use, method used at first contraception and reasons for using etc.	Section 4: Current traditional contraceptive use • Questions dedicated to traditional method users (i.e withdrawal, rhythm and folkloric methods). • Reasons for using traditional contraceptives, and methods used concurrently with traditional methods.
Section 5: Sexual activity and contraceptive use in last 6 months. • Sexual activity and number of partners in the 6 months preceding the pilot survey.	Section 5: Ever use of contraceptives • Contraceptive use at any time before the last one month.

• Contraceptive methods used in the last 6 months and reasons for using each method. • Partner concurrency and contraceptive use.	• Probing for methods used at any time before the last one month, starting with traditional methods. • Age at first contraceptive use, method used at first contraception and reasons for using etc.
Section 6: Future contraceptive preference and fertility intention. • Future fertility intentions and associated reasons. • Future intentions to use contraceptives and methods preferred. ***END	Section 6: Sexual activity and contraceptive use in last 6 months. • Sexual activity and number of partners in the 6 months preceding the pilot survey. • Contraceptive methods used in the last 6 months and reasons for using each method. • Partner concurrency and contraceptive use.
	Section 7: Future contraceptive preference and fertility intention. • Future fertility intentions and associated reasons. • Future intentions to use contraceptives and methods preferred. ***END