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Marston, C; Renedo, A; Nyaaba, GN; Machiyama, K; Tapsoba, P; Cleland, J; (2018) Improving the Measurement of Fertility Regulation Practices: Findings from Qualitative Research in Ghana. *International perspectives on sexual and reproductive health*, 43 (3). pp. 111-119. ISSN 1944-0391  
DOI: <https://doi.org/10.1363/43e4517>

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International Perspectives on Sexual and Reproductive Health

Author accepted manuscript

# **Improving surveys of contraceptive use and accounting for periodic contraception: findings from qualitative research in Ghana**

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## **Abstract**

### **Background**

Survey data on contraceptive use help to plan services, understand demographic trends, and compare geographical areas. The Demographic and Health Surveys (DHS) are particularly well known and respected source of information. Yet DHS data paint a confusing picture of low contraceptive method use and simultaneous low fertility among wealthy, highly educated, urban women in Ghana, with higher modern method use and higher fertility in other groups. This study explores why DHS data may provide an incomplete picture of contraceptive practices.

## **Methods**

We interviewed 48 women with secondary education and higher in Accra using purposive and snowball sampling to elicit accounts from different age groups. We conducted 25 one-to-one in-depth interviews and three focus group discussions. Data analysis used iterative thematic techniques.

## **Results**

Women practised combinations of method use that are missed in the DHS, including “counting days”, withdrawal, condoms, and frequent use of emergency contraceptives. Women often described “counting days” to avoid pregnancy, adding contraception ad hoc in ‘fertile’ days. This practice can be characterised as ‘periodic contraception’. Method combinations varied between cycles forming a ‘mosaic’ of method use over time.

## **Discussion**

DHS questions can measure continuously used modern methods but currently cannot adequately capture periodic contraception or emergency contraception use. The DHS also misses important aspects of the combinations and mosaics of dual, triple, or quadruple fertility regulation methods. Improvements are needed and new questions should be piloted to examine whether they yield substantially different estimates, with a view to possibly introducing a new question module.

## **Introduction**

Universal access to contraception has been a key global health goal for decades including currently in Family Planning 2020,<sup>[1]</sup> and the Sustainable Development Goals (SDGs). The extent to which need for contraception is met is a crucial indicator of progress towards this goal. For instance SDG indicator 3.7.1 measures proportion of

women of reproductive age (15-49 years) who have their need for family planning satisfied with modern methods.[2]

Accurate data help to shape and plan family planning provision worldwide. Surveys are routinely used to measure prevalence of contraceptive use, unmet need for family planning, and other relevant indicators. The best known of all of these are the Demographic and Health Surveys (DHS), which allow comparisons between countries and across time by using a format modified slightly according to country needs, but broadly standardised across survey locations and time periods.

While survey data play a crucial role in our understanding of fertility and its correlates, several problems have been identified in how surveys capture fertility regulation strategies, particularly when these strategies do not involve ‘modern’ methods. For instance, underreporting of traditional contraceptive methods in surveys was identified in France in the 1970s [3], and in Burkina Faso [4] and Ghana [5] more recently.

Different surveys can yield different estimates of fertility regulation strategies for the same or similar populations. For instance, in Ouagadougou, Burkina Faso [4] a survey designed to investigate underreporting of natural methods in the DHS added the specific question “are you currently using the rhythm method (or periodic abstinence or Cyclebeads, or the calendar method”. This survey recorded use of traditional methods among 26% of married women of reproductive age, compared with only 5% recorded for the capital in the 2010 Burkina Faso DHS,[6] while recorded prevalence of modern methods stayed similar between the two surveys.[4] The second wave of the Women’s Health Study of Accra (WHSa-II) in 2008-2009 also recorded much higher levels of current use of the calendar rhythm method than the 2008 Ghana Demographic and Health Survey (GDHS). The WHSa-II – which questioned a much smaller sample of

women with a slightly different age range than the GDHS – indicated that 23% of non-menopausal women aged 20 to 54 reported current use of this method vs. 9% among women aged 15-49 living in Greater Accra in the GDHS 2008, with the highest prevalence among women in the wealthiest households in both surveys [7]. The much higher overall prevalence recorded in the WHSA-II may be an artefact of the different sample, but seems likely to be because it contained specific probe questions (e.g. Q1624 ‘Are you currently using periodic abstinence/timing/calendar method to avoid pregnancy?’), which may have increased rhythm method reporting.

Ghana is pioneering fertility decline in West Africa: the total fertility rate (TFR) has fallen by over two births per woman since the 1980s.[8] If underreporting of fertility regulation strategies in standard household surveys is widespread, it could at least partially explain why Ghana records low levels of contraceptive use compared with other countries with similar TFR. For instance, in 2012-14, Kenya and Ghana recorded similar TFRs (Kenya 3.9, Ghana 4.2) but very different levels of contraceptive prevalence among married women (Kenya 58%, Ghana 27%).[9]

Disaggregated data for Ghana show some unusual patterns.[9] Currently, the lowest levels of modern contraceptive prevalence are among the wealthiest, urban women – the opposite to what is usually seen; in the 2014 Ghana DHS, the lowest prevalence of modern methods is recorded in the richest quintile (19.5%); and in urban (19.8%) rather than rural (24.6%) areas. Also unusually, the highest prevalence of modern method use is among women with only primary education (26.8%); women with higher levels of education report lower prevalence (23.7%).[10]

DHS surveys in Ghana record a decline in use of contraception among urban and better educated married women in Ghana over time [11]. Among women in urban areas, reported current use of any contraceptive method by married women declined from 31%

in 2003 to 27% in 2008, reaching a low of 26% in 2014. Modern method use recorded in the same population was 24% in 2003 declining to 19% in 2008, then increasing to 25% in 2014.[10, 12, 13] In Greater Accra, reported use of modern methods declined even further, from 26% in 2003 to 19% in 2014 – the lowest recorded in the country, apart from Northern Region (11%).[10] Among married women educated to secondary level and higher, reported current use of any method of contraception declined precipitously from 40% in 2003 to 30% in 2008, then recovered somewhat, reaching 34% in 2014 (modern method use in this population was recorded as 28%, 19% and 24% in 2003, 2008 and 2014 respectively).[10, 12, 13] Yet counterintuitively, among the declines in contraceptive use, TFR among married women aged 15-49 with secondary or higher education in Ghana also declined from 2.5 to 2.1 between 2003 and 2008 [12, 13] although there was an uptick to 2.6 in 2014 [10]. Meanwhile, urban TFR stayed relatively stable (3.1 in 2003; 3.1 in 2008, 3.4 in 2014).[10, 12, 13]

One possible explanation for the 'gap' between the expected fertility related to low contraceptive use and the actual levels of fertility recorded is unrecorded abortion. The most recent (2007) data indicate higher abortion levels among the groups with the lowest fertility: wealthy, urban and highly educated women – the same groups that also record low levels of modern method use which supports the idea that abortion is helping lower fertility. The abortion rates are almost certainly underestimated, however, and it is not possible to know the extent to which recorded differences reflect genuine differences in abortion rates or simply differences in willingness to report. The total abortion rate in Ghana was recorded at 0.4 overall, and higher (0.6) in urban areas and among most educated women (also 0.6).[14] Ghana enacted a comparatively liberal abortion law in 1985 and the WHSA-II appears to show a rise in abortions in Accra around 2008 although sample size is small and raw data are not provided.[7] Abortion may help

explain some of the difference in fertility recorded versus what might be expected with such low contraceptive prevalence.

One additional consideration is underreporting of traditional methods, mentioned above as a concern, and cited as a problem in this setting.<sup>[9]</sup> One analysis has shown that women who were not using contraception and wanted to delay childbearing for at least two years, or who wanted no more children, were twice as likely as women wanting a child soon to report abstinence in the last four weeks in the GDHS, suggesting that reduced coital frequency may be used as an alternative to contraceptive methods.<sup>[11]</sup> Women who had not resumed sex since last birth were excluded from the analysis <sup>[11]</sup> and we do not know from these results whether the women were also abstaining long term.

A follow-up qualitative study of how well GDHS measured unmet need for contraception found that complete abstinence as an intentional method of family planning may not be adequately captured by the DHS questions, which focus on the rhythm method.<sup>[15]</sup> Long periods of abstinence or other natural methods may be preferred over modern methods, for diverse reasons such fear of side effects, cost, religious teachings or partner opposition to certain methods.<sup>[15, 16]</sup> Reported use of traditional methods is highest in the most educated group (11% among women with secondary or higher education vs 2% among women with only primary education).<sup>[10]</sup>

There may also be some underreporting of modern methods in northern Ghana:<sup>[17]</sup> stigma can be perceived to attach to users,<sup>[17-19]</sup> and covert users may be reluctant to report use.<sup>[17, 20]</sup>

Other explanations include unmeasured use of emergency contraceptive pills (ECPs) which have been licensed in Ghana since 2000 and are available in clinics and pharmacies without prescription.<sup>[21]</sup> They are used both for 'emergencies' and as a

routine post-coital method.[22] They are widely available across the country and cost between 4 and 19 Ghana cedis per use (around 0.23USD to 4.35USD).[23]

We aimed to understand how educated women in Ghana were achieving low levels of fertility with such low reported levels of contraceptive use. Our rationale was that the behavior of elite women living in a capital city is of special interest because they are likely to be the pioneers of reproductive change with considerable potential influence on less privileged sectors. If they are deliberately avoiding modern methods, it is important to understand how they are controlling their fertility and why. Thus insights into their behavior could have major implications for the future design of family planning programs.

During our study, findings about women's contraceptive use emerged that need to be taken into account in the design of future surveys. We published a report on our overall findings about women's experiences of contraception and abortion,[20] and a paper on fertility regulation as identity maintenance.[24] Here we present our survey-relevant findings, focusing particularly on traditional and ad hoc methods and combinations of methods.

## Methods

We used a qualitative study design to explore fertility regulation strategies among highly educated women in Accra, Ghana.

We recruited 48 participants via snowballing and purposive sampling from personal networks, shopping malls, work places, and universities. All women had completed secondary education or higher. We purposively sampled women from different age groups to capture different parts of the reproductive lifecourse, and although many had experienced stable relationships we did not select any participants on this basis. We conducted individual and group interviews in late 2014.



**Individual interviews** explored women's own reproductive lives and relationships and their views on, and use of, different fertility regulation strategies. We interviewed 25 women, eight aged 18-24, 12 aged 25-39, and five aged 40-49. The numbers per age group were pre-specified, with half in the key reproductive ages 25-39. All were currently or previously in stable relationships. Nineteen women had ever been pregnant, 12 had children. Authors (authors 1-3) and experienced local interviewers conducted the interviews. All interviewers were women aged 30-50. The number of interviewees was based on our past experience suggesting that this would yield a reasonable diversity of responses and allow general themes to emerge.

We conducted three **group discussions**, with a total of 23 women. Each group included participants of a particular age range; 18-24 years, 25-39 years, and 40-49 years. The group discussions elicited views on fertility and contraceptive use generally, and different types of methods for regulating fertility specifically. We split the groups by age, hypothesising that women were likely to have different priorities and views at different points in their lives. Many women in the groups were married or in stable relationships. The youngest group contained many women who were currently studying and who did not have children. Group discussions were held in classrooms in a local university after hours. Discussions were led by Ghanaian interviewers, mostly in English, with some interjections in Twi, and [authors 1-3] contributed questions where necessary.

All participants received written information about the study and provided informed consent to participate. We received ethical approval from Ghana Health Service and from the [author 1 institution] ethics committee.

All interviews were audio-recorded after obtaining written consent, and transcribed. Transcriptions contained both literal (word for word) and 'correct' (i.e. more adequately rendering the meaning in English) translations of phrases or sentences in the few places

where Twi was used. Interviewers made notes on locations, body language, and other observations. Transcripts were double checked in full by the research team to ensure accuracy.

We used an inductive, thematic approach to analysis in which increasingly abstract themes arising from the data were identified in a process of ‘constant comparison’.[25] We organised the data using NVivo qualitative data analysis software (QSR International Pty Ltd. Version 10, 2012). Where possible, data from early interviews informed subsequent interviews (we sought interviewees of different ages to those already interviewed and adjusted interview questions somewhat in response to ongoing findings). In these respects, we followed the principles of grounded theory.[25] We also examined cases in depth and paid close attention to specific elements of the narrative (e.g. reported speech (i.e. how participants’ narratives incorporate reports of what others say), appeals to common sense, use of metaphor). Analysis was conducted by [authors 1-3], including discussion of how best to characterise emerging themes, constant cross referral between emerging themes and each interview narrative as a whole to ensure fidelity of coding, and detailed attention to each other’s work to ensure systematic and comprehensive analysis.

## Findings

Women participants in our study talked in detail about how they used contraceptives and their accounts indicated where problems in survey data collection may arise.

Our in-depth interviewees reported use of various methods at different times to avoid pregnancies and births, including injectables, oral contraceptive pills, ECPs, as well as ‘traditional’ methods including ‘counting days’ and withdrawal. Participants reported undergoing both medication and surgical abortions, some repeatedly. Some also

reported having spent long periods abstaining from sex because of being away from their partner, for instance during periods when they were studying away from home. Here we go into detail about their accounts of the most normalised methods that are likely to cause problems in surveys – ‘counting days’, withdrawal, condoms, and ECPs.

## **‘Counting days’**

A key traditional method that many women reported using themselves, and expected others to use, was ‘counting days’, i.e. using a calendar method which involved counting days from the last menstrual period (first or last day), using the count to estimate ‘unsafe’ days with high risk of conception, and then acting to reduce pregnancy risk on this basis.

Fertility awareness methods were rarely spontaneously mentioned as a way to prevent pregnancy. Yet ‘counting days’, was used at one time or another almost universally by the women we interviewed and spoken about as a taken-for-granted part of a woman’s life. Women spoke about menses as if they and other women would be expected to know their menstrual cycles very well. They mentioned they were ‘safe’ at certain times of the cycle. Some reported that their male partners knew that certain times in the cycle were ‘safe’ or ‘unsafe’ in terms of risk of pregnancy, although the women were in charge of keeping track of when this was.

Opinions about the exact time that was ‘safe’ were variable and counting techniques varied between women. They spoke about considering the fertile period to last ‘4 to 5 days’ or ‘from day 10 to day 16’ and all focused on mid-cycle, but there was little precise agreement, suggesting that the extent to which ‘counting days’ can help prevent pregnancy is also variable. When we asked about method use, women ‘counting days’ would often say that they did not use any method, but later told us about practices such as noting ‘safe’ or ‘unsafe’ times, which suggested they were using a calendar method.

Interviewer: Okay, have you or your partner, or any other partner, ever used a method to prevent pregnancy?

Not really. Those ones that we used were out of curiosity, but not consistently using it to prevent pregnancy.

Interviewer: Oh okay.

And those methods are with the condoms and then the spermicides. They are the only ones that I have tried. [...]

Interviewer: Okay, all right, apart from this period where you used... tried the condom and the spermicides, have you ever tried any methods?

No, no those are the only two methods that I have tried. [...] he is gotten to know about my cycle.

Interviewer: Okay.

And so he knows when I am safe, and when I am not safe.

Interviewer: Okay.

And so that is what he usually uses. Any time that we want to have sex, it's around the times that I am safe.

Interview L (age 36)

While the rhythm method usually refers to avoiding sexual intercourse during 'unsafe' period (and is defined as such in the DHS), the 'counting days' approach did not often involve abstinence: rather, women told us how they added in further methods to avoid pregnancy on 'unsafe' days. These practices are therefore better characterised as 'periodic contraception' than rhythm method because of the lack of periodic abstinence.

Women also said they used condoms during 'unsafe' periods without explicitly mentioning calendar method use at all. In this way, it appears that changing sexual

practice or contraceptive use based on perceived fertility at different times of the menstrual cycle is considered a baseline behaviour that everyone employs, and so might not be considered a 'method' as such.

## **Withdrawal and condoms**

In a very common form of periodic contraception, withdrawal was combined with counting days. Women said they used withdrawal during the 'unsafe' days, as opposed to using it during 'safe' days as a backup. One woman also described using withdrawal as an insurance against injectable failure between doses although this was unusual:

Yes, I was doing that [withdrawal] around the same period that I was taking the injectable because I didn't want a situation where I will go and take the injection and maybe I will be pregnant. I will take the injection and maybe I will be pregnant before taking the injection.

Interview N (age 37)

One respondent explained that although she used "the date" (i.e. counting days), withdrawal and condoms, she preferred condoms because she did not want to be "stressed out" calculating her "safe" periods since the condom could "do the job". She also explained that she enjoyed the intimacy with condoms because her partner stayed next to her rather than moving away to ejaculate. She said that her partner initially had reservations about condoms but now uses a condom only at the last minute, preferring this to wearing a condom throughout coitus. She says:

So, umm, I mean, once I knew I had the condom I didn't have any problem with, thinking of calculating or... you know? As in all the things that I didn't want, the condom will spare me that, not having... So I don't have to have kids when I don't want it. I can still have my fun, you know, still have sex and be okay, still have

that intimate period with my husband having sex and I was fine with that... because it's been reliable so far... I just, my husband uses the condom and then the withdrawal and then I use the date... a slight mistake, you know, so I am particular about that. That is the reason why, umm, if I'm safe, fine, then I could do the withdrawal and then I know, but if I am not too sure about my timing then, I'll, I will force for him to use the condom.

Interview R (age 38)

Interviewee R said she prefers using condoms and started by telling us she uses them “throughout”. However, in addition to clarifying that her partner will only put one on just as he is about to ejaculate, she said:

If it happens that [...] I run out of stock, I can use either withdrawal or I can use my calendar to calculate it, yeah. So at almost every point in time I do know my cycle [...].

Interview R (age 38)

Note that this reporting would also suggest that claims of consistent condom use may be overstated in surveys if additional probing (e.g. “are there ever times you do not use a condom”) is not carried out.

Women often reported using both withdrawal and condoms with the same partner.

Interviewee J had told us she used condoms to prevent pregnancy. On further questioning, however, it became clear that she was also having penetrative sex without condoms prior to the penetration with a condom. She described routinely alternating use of withdrawal and condoms during different episodes of penetration in the same sexual event to enjoy non-use of condoms first.

Interviewer: but what I want to understand is why you chose to use both condom and the pull out as you put it? [...]

He said he wanted to enjoy me better.

Interview J (age 39)

Here, despite the fact that she was using both withdrawal and condoms, she did not mention withdrawal until further questioning. This type of use again would not generally be captured in survey data.

Limited condom supplies and mood may also affect method choice, with one interviewee describing how in one day she might use three different methods:

For instance if you have two small condoms available and you want to have sex like three times a day, umm you go for the withdrawal maybe in the morning, and mostly...I don't know about other women, but I start it at dawn. It's cooler that way [both laugh], it's cooler that way so at dawn you go for the raw meat, and then maybe later in the day after breakfast lunch you want to go for the condom, and then in the evening you want, you just want it all in, and afterwards you go for the EC pill.

Interviewee V (age 22)

## Multiple methods

A typical way of using multiple methods for periodic contraception involved 'counting days' combined with withdrawal in the 'unsafe' days (i.e. middle of the cycle), plus oral ECPs in the cycles where the woman felt that she needed them. Over time, then, the combinations used in each menstrual cycle might vary, forming a mosaic of different methods. We use the term 'mosaic' to distinguish this type of pattern from simple 'combinations' of methods that might be used in a given menstrual cycle, with the pattern over time (i.e. the combination of combinations) being what we refer to as a 'mosaic'. In some cases, the two may be similar (e.g. if there is no combined method use in any cycle or if combinations do not vary from cycle to cycle).

Women considered themselves in need of ECPs if the man had not withdrawn in time or if he had not withdrawn at all.

Yeah so basically if withdrawal is going to take effect, then the woman has to be on top. Because if not the guy would just, they don't think so they will just [sound effect: pff!] into you, they would just ejaculate into you, and then the unexpected happens. But when that happens you still have another option to take the emergency contraceptive pill. [...] and then with the withdrawal if... you know sometimes it doesn't... like you think he's withdrawn but maybe something has entered you, so you go with the EC pills, just to be sure. [...] With that, umm withdrawal is cool, but afterwards you still be thinking did the guy come in me or not, am I safe or am not safe you know so I think the EC pills are... It's okay.

Interview V (age 22)

Like interviewee V, other women did not mention male involvement in their risk assessment and may make the decision to take ECPs on their own. Here interviewee V describes the dual risk assessment: "did the guy come in me or not, am I safe or not safe" i.e. she tries to guess whether her partner ejaculated inside her without asking him, and also whether she is in a 'safe' time of her cycle or not, to decide whether or not to take ECPs.

A woman using this common method mosaic could be using between one and three methods at any given time. She would use all three in combination in some cycles, counting days then using ECPs if she had intercourse in the 'unsafe' time and the partner did not withdraw in time, or if she was worried about the accuracy of her counting to determine the 'safe' days. In other cycles she might use only two (e.g. withdrawal and 'counting days').



While DHS and similar surveys are suitable for measuring current use of methods that provide continuous protection, such as injectables, they are not yet designed to capture the complexities of the types of method combinations and mosaics that our interviewees were using routinely and so may inadequately represent pregnancy-avoidance practices. For instance, in the 2014 GDHS, the interviewer could have recorded multiple answers if women happened to mention more than one method when they were asked about how they tried to prevent pregnancy. The questionnaire itself, however, does not contain a prompt question to elicit multiple methods, and women were not asked directly whether they used more than one method. Even if multiple methods were recorded, follow up questions are only asked about the most effective one. The DHS also does not record temporal variations within a cycle or across several cycles that are seen with these types of mosaics of method use.<sup>[10]</sup>

### ***Frequent use of emergency contraceptive pills***

Women did not often express concerns about ECP side effects, although they sometimes said they worried about over use. However, over use and any harms were not defined. Women seemed to see ECPs as different from other hormonal methods, for which side effects were frequently mentioned. The younger women in the focus group in particular emphasised their own and their friends' use of ECPs, talking about this use in a way that suggested it was normalised in their peer groups, and perhaps more widely as well.

Group member A: Before, before I started, er, giving birth, whenever I have my menses I will write the date on my, I will keep the date on the phone so for every month so I have the, er, the periods: their date, so with this you will be able to calculate your safe period. You know when you are safe and when you are not safe. Yes we do keep them. You see that sometimes you go for a quickie and you are even afraid, you come and take it and you

make sure you calculate all the... [laughter from room] It's true! All the... the periods and see whether truly truly you were safe [...]

Group member B (clarifying): So during times that you think that, hmm. Is that there's an emergency somewhere then you just go in and take emergency contraception.

Moderator: Even within the, er, the married couples? She says she's married.

Several group members: Yes!

Moderator: Oh okay.

Group member B: We still take it

#### Focus group (age group 25-49)

With other hormonal methods, on the other hand, women mentioned fears about future fertility or cancer risk. One woman reported feeling uneasy because she had amenorrhoea for a year from implants (which she then discontinued). She said that the blood from the menses was being stored in her body, which could lead to health problems – a common concern mentioned by our participants.

I did the one-month injection. I did the two-month. It didn't work for me. [...] If I say it didn't work for me, I mean I realise my menses was not really flowing like how it is supposed to flow. I tried the two-, I didn't really see anything, like, that one too, my menses wasn't really flowing well and I tried the... I tried the three-month too and then for the... with the one under the arm, it seized for a whole year. My menses didn't come for a whole year and I, I didn't really feel comfortable about that, so I went... I decided to go for the copper T and I was told that because of the Caesarian section, I can't use the copper T.

Interview N (age 37)

## Discussion

Current data collection instruments may yield incomplete and even misleading findings.

We contribute here evidence of specific examples where this may cause problems for surveys aiming to measure use of contraception. A key 'missing piece' in terms of current use is likely to be women's use of 'periodic contraception' including combinations of multiple, concurrent methods, particularly 'counting days', withdrawal and ECPs, along with specific details of how multiple methods are used.

Furthermore, even with an improvement in measures of 'current use' to take these combinations into account, it is also important to recognize that combinations may change over time, forming what we have termed a 'mosaic' where specific combinations of methods were employed over different menstrual cycles depending on the circumstances. In this study we find the concept of mosaics more useful than thinking about method use in terms of simple combinations in one menstrual cycle because it captures the notion that the combinations may vary over time and also helps indicate the difficulties of picking up the nuances of fertility practices in surveys.

Highly educated women in Accra are recorded in the DHS as having low fertility despite the DHS also recording low use of contraception, while abortion levels are also recorded as low. Our study suggests that this paradox is likely to be a measurement problem. As well as the perennial problem of underreporting of abortion, the DHS may also underestimate common fertility reduction strategies used by women such as 'counting days' combined with withdrawal, and does not necessarily capture how mosaics of different methods within and between cycles are used to reduce pregnancy risk.

As this study used qualitative data to explore the issues it does not attempt to provide statistical representativeness in its findings. It is unclear whether or not these problems would apply beyond the group of respondents interviewed, or more widely, but given the

similar related findings from qualitative and quantitative studies in other parts of West Africa, it seems likely that these problems, or similar ones, will also affect survey data elsewhere in the region.

A key problem appears to be that nearly all surveys, including the DHS, apply a concept of current use, which while suitable for women who continuously use methods including oral contraceptive pills, IUDs, implants, and injectables, is less suitable for ad hoc methods, and for capturing the 'periodic contraception' combinations reported earlier, particularly given the lack of prompts for multiple method use. To capture these, a more detailed module on behavior in the last menstrual cycle is needed. Capturing the mosaics of methods as they vary over time is likely to be beyond the scope of the DHS so will require specialist studies. Interpretations of DHS data, however, should take these mosaics into account.

The contrast between apparently low levels of current calendar rhythm method use recorded by the DHS (3.2% of married women aged 15-49 in 2014)<sup>[10]</sup> and the almost universal ever use of a similar method (i.e. 'counting days') among our interviewees is striking. Our sample is not statistically representative but the near universality of using 'counting days' at one time or another among our participants, taken in conjunction with the higher proportions of similar methods recorded in other surveys in response to specific prompt questions about calendar method use (see introduction) strongly suggests that the DHS has not captured current use of this key method adequately in Ghana.

Underreporting may occur because, as among our interviewees, women appear to assume 'counting days' is the baseline for everyone. It may be so normalised as to be considered not worth mentioning. The DHS already takes steps to minimise this by introducing a number of different methods, which should help to establish calendar

methods as being part of the range of methods of interest. However, the DHS does not currently account for periodic contraception. The rhythm method is explained in the DHS as follows: “to avoid pregnancy, women *do not have sexual intercourse* on the days of the month they think they can get pregnant.” (our emphasis).[\[10, p. 406, 26, p. 68\]](#) Many of our interviewees described using other methods on ‘unsafe’ days i.e. periodic contraception rather than abstaining from sex, which may help explain some of the apparent discrepancy: they are correctly reporting non-use of rhythm method as defined in the survey i.e. they are not abstaining.

This study also highlights the way fertility awareness in Ghana may be considered fundamental for all well-educated women and used by most to some extent, which may reduce its being seen as a ‘method’ as such, and so underreporting may result. The DHS asks women whether they do anything to avoid or delay pregnancies rather than asking about ‘methods’, but in Ouagadougou, Burkina Faso more focused survey questions yielded higher prevalence of natural methods than the DHS.[\[4\]](#) The DHS might yield higher estimates of how ‘counting days’ contributes to overall protection if its ‘fundamentality’ were addressed more directly in the questionnaire. In Cameroon, the rhythm method is favoured because it conforms to notions of modernity and self-discipline among women there.[\[27\]](#) It is possible that a similar association occurs in Ghana, although none of our interviewees stated this explicitly.

It is also important to understand from survey data exactly *how* methods are combined. For instance, reports of withdrawal combined with the rhythm method could indicate an effective strategy if women were abstaining from sexual intercourse in the middle of the cycle and using withdrawal at other times. However, this is not how the methods were combined by the women in our study, who said they used withdrawal in the middle of the cycle. Our interviewees described using condoms in a similar way i.e. only in the ‘unsafe’

period, except when they were used for dual protection against infections. Where infection prevention was not a concern, women might alternate between condom and withdrawal use. This periodic contraception would also not be readily captured by the DHS survey instrument.

Demographic and Health Survey questions are also limited in how they capture use of ECPs: a key hormonal method among our participants. The 2008 GDHS asks about knowledge and ever use of the method. Thirty-five percent of women said they knew the method, but only 3% said they had ever used it.<sup>[12]</sup> Underreporting of ECP use seems likely. In our study ECP use seemed normalised which would suggest higher proportions of women reporting ever use of ECPs than recorded in the GDHS. Underreporting might stem from a desire to avoid stigma e.g. if ECPs are erroneously conflated with medication abortion, although there was no evidence of such conflation in our data.

Use of ECPs may also have increased since the 2008 DHS: current use of emergency contraception was not recorded in the 2014 GDHS except possibly in the category of 'other modern method' (only 0.3% respondents). ECPs in our study were reportedly used very frequently and were preferred to continuously used contraceptive methods – perhaps because they were seen as less risky in terms of possible damage to health as they are only taken when needed. While DHS questions ask about knowledge and ever use of ECPs, women may not report ECPs in the contraceptive calendar because ECPs were used ad hoc, even when used regularly. Even if women do report use of emergency contraception in the calendar, the current DHS classifies and records these women as using 'other' modern method for the widely used variable (v312) on current contraceptive method and does not ask any follow up questions.<sup>[28]</sup> Questions that ask about repeated ECP use more directly might provide a clearer picture.

The problems of enumerating abortions in standard surveys appear to be intractable. It seems likely that use of 'counting days' combined with withdrawal compared with, for example, the use of implants, would increase the risk of unintended pregnancy and hence be associated with greater use of abortion to attain the desired level of fertility.[29]

### **Can these problems be addressed?**

It is difficult to elicit detailed information in surveys where questions must be limited in number. Nevertheless, questions relating to sex and method use in the last menstrual cycle could be added into West African surveys, and possibly elsewhere. To maintain international comparability, any extra questions would need to be an adjunct to the conventional questions on current use. This is not just to ascertain whether or not women correctly identify the 'unsafe' period but also how this knowledge is used: do women abstain from sexual intercourse in the 'unsafe' time or do they simply use another method at that time? Do they use withdrawal in 'safe' periods to try to mitigate risks of pregnancy in those periods? Do they use ECPs on 'safe' days or only on 'unsafe' days? Without more detail on 'counting days' practices, surveys have reduced explanatory power, particularly if these practices are widespread or becoming more popular – something that is currently unknown although the fact that specific prompt questions have revealed a higher prevalence of 'counting days' in other surveys indicates that this could be worth investigating – even if it is only to add a prompt for these methods when women are asked about current use.

In addition to ever use of ECP, recent use should be included, such as a question about ECP use in the last menstrual cycle. Our data suggest the emergency contraceptive pill is a crucial method in Accra and is often used as a backup for 'counting days'. Failure to include questions on recent ECP use is likely to lead to overestimates of the reliability of other methods reported.

Different mosaics and combinations of fertility regulation methods should be reported using existing data where available (e.g. to illuminate in what ways and where women have reported multiple concurrent methods in existing surveys), and it would be helpful to find ways to account for different combinations of method use and ‘periodic contraception’ in future surveys. Ways to do this would need to be investigated but for instance could involve asking, “have you used [method] in the last four weeks (in your menstrual cycle)” for traditional methods rather than only asking “which method are you currently using” and potentially adding further questions about how different methods are used. This study has identified key potential areas where question content and sequencing may adversely affect surveys. To obtain a clearer picture of fertility regulation in Ghana – and elsewhere – these areas should be addressed. Meanwhile, analysis of existing survey data should take into account that data on traditional methods is likely to be incomplete.

Use of a new module asking about sex and method use for the previous menstrual cycle will not solve all problems. Current underreporting of abortion is likely to continue as may underreporting of ECPs. It seems unlikely that any general survey would be able to capture individual women’s changes in use of methods over different cycles, which would require detailed questions probably best reserved for specialist surveys. There is also some evidence that women underreport ‘male’ methods (condom, withdrawal).<sup>[30]</sup> In addition, practices of women who have not had sex in the past month would not be captured – an important limitation given that some 37% of married women report no sexual intercourse in the past four weeks in the 2014 GDHS (including post-partum abstinence). Our participants told us how they might spend periods of weeks or months away from their partners for study or for work, and this study found similar reports on abstinence to those already documented in this setting.<sup>[15]</sup>



Any changes should be piloted to assess whether they yield substantially different data before they are added to the DHS to ensure that any additional burden is worthwhile.

Adding any module to the DHS is undesirable because the questionnaire is already very long. It may also seem far fetched to advocate for a new module on the basis of this and a few other localized studies in West Africa. If it were introduced, however, the module would only be applied to the subset of sexually active women who do not report use of a continuous method. It is important to consider testing new ways to capture these methods because the use combinations we described here were reported by elite women who were aware of modern, highly effective methods but who had explicitly chosen alternative routes to limiting their fertility. There is no reason to believe this is a temporary aberration, indeed it may spread because of the social influence of elite women and there is currently limited opportunity to measure this on a population level. Better understanding of traditional method use is also important given that current family planning initiatives emphasise highly effective continuous methods, but the advent of ECPs and medication abortion make the use of inherently less effective methods more feasible for birth control. Unless less effective methods are measured properly, their role will continue to be largely ignored and the lack of fit between reported contraceptive practice and fertility in Africa will continue to perplex.

## **Acknowledgements**

The STEP UP (Strengthening Evidence for Programming on Unintended Pregnancy) Research Programme Consortium, funded by UKaid from the Department for International Development, provided support for fieldwork and salary.

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Suggested citation: Marston C, Renedo A, Nyaaba G, Machiyama K, Tapsoba P, Cleland J (in press) *Improving surveys of contraceptive use and accounting for periodic contraception: findings from qualitative research in Ghana*. International Perspectives on Sexual and Reproductive Health

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