RESEARCH ARTICLE

Dynamic stagnation: reasons for contraceptive non-use in context of fertility stall [version 1; peer review: 1 approved, 2 approved with reservations]

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Abstract

Background: While most countries have experienced reductions in the total fertility rate (TFR), there are countries where the fertility transition has not begun and others where the fertility transition has stalled with TFR still well above replacement level. We use these contexts of “fertility stagnation” to explore reasons behind contraceptive non-use among women who desire to delay or avoid a future birth. Specifically, we explore whether women’s reasons for not using contraception are stagnant as the population-level indicator, TFR, suggests or are more dynamic. This nuanced understanding can inform programmatic direction for countries especially in need.

Methods: Using Demographic and Health Survey (DHS) data from the two most recent surveys of ten study countries—five countries that have not yet experienced a fertility transition (“pre-transitional”) and five countries that began the fertility transition but stalled (“transitional”)—we explore trends in reasons for non-use.

Results: We find that that reasons for non-use are changing. Specifically, in pre-transition study countries, women are increasingly citing attitudes opposing contraception as reasons for non-use. In transition countries, women are increasingly citing reasons related to service quality and method side effects. Perceived low fecundability is increasingly cited among both pre-transition and transition study countries. Geographical access and cost are not prominent frequently cited at either time point.

Conclusions: These findings highlight the need for prioritized programmatic attention aimed at: reducing opposition to contraception in pre-transitional countries; improving service quality and addressing issues of side-effects, both experienced and perceived, in transitional countries; and addressing fecundability perceptions in both types of country contexts. We remind policy makers that even in contexts of fertility stagnation, underlying attitudes, norms, and barriers to contraceptive uptake are shifting. Lack of change at the population-level can mask important changes at

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

the individual-level that must be accounted for in program development and implementation.

Keywords

contraception, non-use, fertility, stall, transition, DHS

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Introduction

While many countries have experienced reductions in the total fertility rate (TFR), there are some countries where the fertility transition¹ has not begun (“pre-transitional countries”, henceforth “PTC”) and others where the fertility transition has stalled with TFR still well above replacement level (“transitional countries”, henceforth “TC”). Fertility desires and infant mortality undoubtedly play a role in TFR changes or lack thereof (Bongaarts, 2006; Westoff & Cross, 2006). Yet even in countries with high fertility desires, high infant mortality, and high TFR, there are still large proportions of women with unmet need for family planning (FP). Addressing unmet need for FP may have far reaching consequences, with the potential to reduce poverty and hunger and avert maternal and child deaths (Cleland *et al.*, 2006). Understanding the reasons behind why women are not using contraception when they have an explicit desire to delay or avoid a future birth is therefore of paramount importance, especially in countries in need of enhanced programmatic and policy attention (i.e., countries that are pre-transitional and countries with stalled fertility transitions). In this paper, we explore the reasons behind contraceptive non-use among women who desire to delay or avoid a future birth in countries with stalled or increasing TFR.

Using Demographic and Health Survey (DHS) data from the two most recent surveys of 10 study countries—five PTCs and five TCs – our main objective is two-fold:

- 1) To determine whether reasons for contraceptive non-use are changing even when TFR is relatively unchanging; and
- 2) If reasons are changing, to identify the directionality of such changes to draw programmatic insight.

While it is important to note reasons for FP non-use among *all* women (Chipeta *et al.*, 2010; Fakeye & Babaniyi, 1989; Sahin & Sahin, 2003), it is of primary programmatic importance to focus on one subset of women – those women at risk of pregnancy who report a desire to delay or avoid a future birth. Our work builds on existing research on reasons for not using contraception among women with unmet need – women who want to stop or delay childbearing but are not using any method of contraception. Sedgh & Hussain’s (2014) seminal work on the reasons for contraceptive non-use among women with unmet need finds that increasing geographic access to family planning methods is insufficient to substantially reduce unmet need; addressing concerns of side effects and health risks is paramount. Similarly, in their examination of reasons for non-use across four countries, Choi *et al.* (2016) find that health concerns, including side effects, are major non-use factors women cited. In their study countries, perceived low fecundability is the most frequently cited reason. Letamo & Navaneetham (2015) find that opposition to use from partners is the main reason for non-use among women in Botswana, while Mekonnen & Worku (2011) find that commodity insecurity is a major reason in Ethiopia.

Our work contributes to and differs from this body of literature by a) focusing on countries experiencing fertility stall and b) analyzing the difference in women’s reasons for contraceptive non-use between two survey periods, a first for this topic. These data can inform programmatic focus for reducing unmet need.

Methods

Data are from Demographic and Health Surveys (DHS). The 10 datasets used for this study are available online from the DHS website: <https://dhsprogram.com/data/available-datasets.cfm> under the ‘Individual Recode’ subsection. Data can be accessed by applying through the DHS website. Please see their [data access help page](#) for information. DHS methodology is described in-depth elsewhere (Short Fabic *et al.*, 2012). In short, DHS is a nationally representative household survey that has been implemented in 90 countries with technical assistance provided by the DHS Program, supported since 1984 by the United States Agency for International Development. DHS provides data on population, health, and nutrition. All women between 15 and 49 years of age in sampled households are eligible for the women’s interview². Survey data pertaining to our study include total fertility rate, unmet need for FP, and women’s self-reported reasons for contraceptive non-use.

We limit our analysis to those countries with at least two DHS conducted since 2000 with final datasets available as of March 2018. We further limit our analysis to those countries that have stalled or increasing TFR point estimates above replacement level (e.g. TFR > 2.1). We define stalled fertility based on Howse’s (2015) meta-analysis on the topic, which builds on work by Bongaarts (2008) and Shapiro & Gebreselassie (2008). Overall, there is agreement on broad notions of stalling fertility: a) fertility decline can only stall in countries where the fertility transition has already started. Thus, countries that are pre-transitional (e.g. TFR >=5, per Bongaart’s categorization) are not considered as cases of stalling; b) fertility should have fallen in some way before stalling; c) countries where fertility is already close to replacement level are excluded. There is however, disagreement in the way these criteria are operationalized with regards to the distinction between pre-transitional and transitional, and the rate of fertility decline that constitutes a stall. We follow Howse’s (2015) broad grouping, and in cases where countries in his analyses are categorized based on older DHS surveys, we update the list based on the most recent data available. Our application of these criteria yielded a final sample of:

Five TCs: Dominican Republic, Egypt, Ghana, Indonesia, and Namibia; and

Five PTCs: Cameroon, Chad, Democratic Republic of Congo, Mozambique, and Niger.

Because we are especially interested in examining changes in reasons for contraceptive non-use, we limit our study population

¹Defined and described in detail in the “Data and Methods” section.

²Only ever-married women are interviewed in a subset of countries in Asia, North Africa and Middle East due to cultural sensitivities.

to women ages 15-49 who report themselves as ever having had sex, not currently pregnant, not currently using a contraceptive method, and who are clear about their desire to either limit or space future births (i.e., women who were filtered through the DHS questionnaire to answer the question on reasons for non-use, q709). Across our 10 study countries, there is a range of sample sizes of eligible women (Table 1). On average at baseline, 1,072 women met our inclusion criteria in PTCs (range: 554 in Chad to 1,494 in Mozambique), while 1,604 women did so in TCs (range: 771 in Namibia to 3,263 in Indonesia). At endline, an average of 1,975 women met our inclusion criteria in PTCs (range: 1,227 in Niger to 2,754 in the DRC), while 1,497 did so in TCs (range: 497 in Dominican Republic to 2,989 in Indonesia).

Our main variable of interest is women's self-reported reason(s) for not using any method of contraception. Eligible women are asked an open-ended question (q709), "Can you tell me why you are not using a method to prevent pregnancy?" Once she provides a reason, the respondent is probed by the interviewer, who asks if there is any other reason besides the one stated. Thus, respondents are able to provide multiple reasons for not using contraception, though the majority reports only one reason. The interviewer then codes these responses into 23 pre-structured categories. Over time, these pre-structured categories have expanded to more precisely capture the range of responses women provide. Additionally, these pre-structured categories are sometimes modified based on country context.

To overcome these survey questionnaire differences, we further group responses into seven categories reflecting elements of family planning access that align with Choi *et al.*'s framework

on measuring access to family planning (Choi *et al.*, 2016). These categories are:

<i>Cognitive</i>	(knows no method, knows no source);
<i>Psychosocial</i>	(respondent opposed, husband/partner opposed, religious prohibition, fatalistic/up to God);
<i>Geographic</i>	(lack of access/too far);
<i>Cognitive and Quality</i>	(interferes with body's normal processes, inconvenient to use, side effects/health concerns, preferred method not available ³ , no method available ³);
<i>Affordability</i>	(costs too much ⁴);
<i>Perceived low fecundability</i>	(not having sex ⁵ , infrequent sex, menopausal/ hysterectomy, cannot get pregnant/difficult to get pregnant, not menstruated since last birth ⁶ , breastfeeding ⁷ , too old ⁸ , husband away ⁷);
<i>Other</i>	(other, don't know).

³These questions were only included in the endline surveys for all countries due to questionnaire revisions between survey phases.

⁴Could refer to transportation cost, which reflects both geographic accessibility and affordability

⁵Accuracy of the perception cannot be assessed.

⁶If women's perception is based on incorrect knowledge of return of postpartum fertility, response may reflect barriers in cognitive accessibility.

⁷Response can also be related to service quality if women implied health concerns related to breastfeeding and contraception that were not properly addressed.

⁸Only in the Indonesian baseline survey

Table 1. Sample characteristics – total fertility rate (TFR) and sample sizes for women (15–49) in each survey and eligible for question on reasons for not using contraception at baseline and endline by country.

Country	Baseline				Endline				Inter-Survey		
	Survey year	Survey sample	Eligible women for q709	TFR (SE)	Survey year	Survey sample	Eligible women for q709	TFR (SE)	Years	TFR Change	Avg. annual change*
(Chad)	2004	6,085	554	6.35 (0.15)	2014	17,719	1,937	6.45 (0.09)	10	0.098	0.010
(DRC)	2007	9,995	1,227	6.29 (0.18)	2013	18,827	2,754	6.57 (0.12)	6	0.281	0.047
(Mozambique)	2003	12,418	1,494	5.53 (0.10)	2011	13,745	2,014	5.92 (0.10)	8	0.389*	0.049
(Niger)	2006	9,223	1,041	7.09 (0.11)	2012	11,160	1,227	7.64 (0.10)	6	0.542*	0.090
(Cameroon)	2004	10,656	1,043	4.97 (0.10)	2011	15,426	1,943	5.09 (0.10)	7	0.119	0.017
Dominican Republic	2007	27,195	1,547	2.43 (0.05)	2013	9,372	497	2.48 (0.07)	6	0.045	0.008
Egypt	2008	16,527	1,566	3.02 (0.04)	2014	21,762	1,972	3.47 (0.04)	6	0.444*	0.074
Ghana	2008	4,916	872	4.03 (0.13)	2014	9,396	1,367	4.19 (0.12)	6	0.167	0.028
Indonesia	2007	32,895	3,263	2.59 (0.04)	2012	45,607	2,989	2.60 (0.04)	5	0.007	0.001
Namibia	2006	9,804	771	3.57 (0.09)	2013	9,176	658	3.65 (0.09)	7	0.08	0.011
Average				4.6				4.8	6.7	0.219	0.033
PTC				6.1				6.3	7.4	0.288	0.039
TC				3.1				3.3	6.0	0.15	0.025

Note: Countries marked in parentheses are those in "pre-transition" as per Bongaarts' definition.

Countries marked with * are where the TFR change is statistically significant at the 0.05 level

* Not precisely an annual change since TFR calculated in each DHS Survey is a 3-year average from the time of interview.

PTC – pre-transitional countries, TC – transitional countries

Our grouping of responses by access element differs slightly from the Choi *et al.* framework. Specifically, we group the access element of *quality* in Choi *et al.*'s framework ("preferred method not available" and "no method available") into the framework's "*cognitive and quality*" access element. We make this change because most study country baseline surveys did not include the two *quality* codes. Moreover, we conducted separate sensitivity analyses excluding and including these two responses in the "*cognitive and quality*" category, data from which yielded similar conclusions. With regard to country-specific modifications to q709, we found that the baseline survey in Indonesia contained two extra responses, "too old" and "husband away," which we added to the *perceived low fecundability* access category.

We present largely descriptive results, detailing the change in reasons behind contraceptive non-use at two different time points. Analyses are adjusted for sample design in each survey using appropriate survey weights, stratification, and primary sampling unit variables (Croft *et al.*, 2018). To assess statistically significant changes between surveys, we use two-tailed tests applying survey weights. P-values less than 0.05 are considered statistically significant. We use STATA 14.2 for all analyses.

Results and discussion

Fertility context

On average across all study countries, TFR change is 0.2 in the inter-survey period (see Table 1). Looking at TFR by transition status, average TFR at baseline is 6.1 in PTCs and 3.1 in TCs. At endline, average TFR is slightly higher in both sets of countries, 6.3 in PTCs and 3.3 in TCs. Meanwhile, mean ideal number of children varies little between baseline and endline in both PTCs and TCs. In PTCs, mean ideal number of children

is, on average, 7.0 at baseline and 6.8 at endline. In TCs, mean ideal number of children is on average 3.2 at both baseline and endline (data not shown).

Family planning context: Do unmet need and contraceptive prevalence change in countries experiencing fertility stagnation?

Turning our attention to changes in unmet need over time across study countries, we find that unmet need at baseline is high, averaging 20% across study countries (Table 2a). At endline, average unmet need across study countries is unchanged at 20%. Unsurprisingly, unmet need is highest in PTCs (average 23% at endline) in contrast with transition countries (average 16% at endline). We also find that the directionality of changes in unmet need varies based on transition status. In all five PTCs, unmet need remained constant or increased over time (average increase of 2 percentage points), whereas in all five TCs, unmet need either remained constant or decreased over time (average decrease of 2 percentage points). Overall, we find that fertility stalls and increases are met with high and persistent unmet need.

With regard to contraceptive prevalence (CPR), we find that—as expected—CPR differs dramatically between the PTC and TC contexts and is much lower in PTCs (Table 2b). Over the inter-survey period, PTCs experienced an average decrease in CPR of 2 percentage points (17% at baseline to 15% at endline) whereas TCs experienced on average no change in CPR (55% at baseline and endline).

In summation, PTCs on average witnessed increases in unmet need and decreases in CPR, while TCs on average witnessed decreases in unmet need and no change in CPR.

Table 2a. Change in unmet need between survey years by country.

Country	Unmet need			
	Baseline (%)	Follow-up (%)	Difference (% point)	p-value
(Chad)	20.6	22.9	2.3*	0.012
(Democratic Republic of Congo)	26.9	27.7	0.8	0.201
(Mozambique)	18.9	23.9	5.0*	0.000
(Niger)	16.1	16.0	-0.1	0.605
(Cameroon)	20.5	23.5	3.0*	0.001
Dominican Republic	11.1	10.8	-0.3	0.793
Egypt	11.6	12.6	1.0*	0.011
Ghana	35.7	29.9	-5.8*	0.002
Indonesia	13.1	11.4	-1.7*	0.000
Namibia	20.7	17.5	-3.2	0.201
Average	19.5	19.6	0.1	
Pre-transition countries	20.6	22.8	2.2	
Transition countries	18.4	16.4	-2.0	

Note: Countries marked with * are where the difference is statistically significant at the 0.05 level. Countries marked in parentheses are those in "pre-transition" as per Bongaarts' definition.

Table 2b. Change in contraceptive prevalence (any method, in-union women) between survey years by country.

Country	CPR			
	Baseline (%)	Follow-up (%)	Difference (% point)	p-value
(Chad)	11.1	5.7	-5.4*	0.000
(Democratic Republic of Congo)	20.6	20.4	-0.2	0.201
(Mozambique)	16.5	11.6	-4.9*	0.000
(Niger)	11.2	13.9	2.7*	0.003
(Cameroon)	26.0	23.4	-2.6*	0.013
Dominican Republic	72.9	71.9	-1.0	0.341
Egypt	60.3	58.5	-1.8*	0.014
Ghana	23.5	26.7	3.2*	0.028
Indonesia	61.4	61.9	0.5	0.453
Namibia	55.1	56.1	1.0	0.493
Average	35.9	35.0	-0.8	
Pre-transition countries	17.1	15.0	-2.1	
Transition countries	54.6	55.0	0.4	

Note: Countries marked with * are where the difference is statistically significant at the 0.05 level.

Countries marked in parentheses are those in "pre-transition" as per Bongaarts' definition.

Have reasons for contraceptive non-use changed as TFR has stalled or increased?

With regard to reasons for contraceptive non-use, we find most study countries have witnessed changes over time in the predominant reasons women cite, regardless of transition status. These changes are statistically significant for all countries except the DRC. We also observe divergent trends in reasons for non-use by transition status, though for a handful of reasons, trends are virtually universal across all study countries, as described further herein.

First, we examine reasons for non-use at the country-level (Table 3a for PTCs and Table 3b for TCs). We find that among all study countries, Niger witnessed the biggest changes between survey rounds, followed by Chad. Both countries saw large declines in reasons cited related *cognitive* access and large increases in reasons cited pertaining to *perceived low fecundability*. Meanwhile, Egypt and Namibia witnessed the smallest changes in reasons for non-use between survey cycles with Egypt seeing slight increases in *cognitive and quality* reasons and slight decreases in reasons related to *perceived low fecundability*. Namibia also saw slight decreases in reasons related to *perceived low fecundability* as well as in *cognitive and quality* reasons, coupled with slight increases in *affordability*-related reasons. Niger witnessed the biggest changes in reasons for non-use among all study countries with massive changes across a host of reasons for non-use. While knowledge of contraceptive methods and services became less of a barrier to FP use in Niger, opposition became a bigger barrier, indicating that while *cognitive* access is improving, *psychosocial* access may be worsening.

In Ghana, service-related barriers to use are becoming more prevalent, with *cognitive and quality* access, *geographic* access, and *affordability*-related reasons for non-use increasingly representing a larger proportion of reasons for non-use.

Do shifts in reasons for non-use differ by transitional status?

It is more useful to look at overall differences by transition status, recognizing that illuminating the categories of difference can be programmatically relevant. In doing so, we find striking differences (Figure 1). Among PTCs, the biggest shifts over time were witnessed in reasons related to *cognitive* access barriers, *psychosocial* access barriers, and *perceived low fecundability*. *Cognitive* reasons for non-use dramatically declined. Conversely, *psychosocial* reasons for non-use increased substantially, as did reasons related to *perceived low fecundability*. Among TCs, the shifts in reasons for non-use were less dramatic. The biggest change was a decrease in reasons related to *perceived low fecundability*. More minor changes witnessed included increases in reasons related to *cognitive and quality* access and reasons classified as "other".

There are enormous differences in reasons for non-use between PTCs and TCs (Figure 1). To elaborate, at baseline, *cognitive* access barriers are on average 8x higher in pre-transition countries than in transition countries. This gap between pre-transition and transition countries holds true at endline. Similarly, *psychosocial* barriers are much higher at both baseline and endline among PTCs as compared with TCs. For TCs, reasons for non-use related to *cognitive and quality* access were

Table 3a. Difference (% point) in reasons for not using contraception between baseline and endline by country for women 15–49 with unmet need in Pre-Transitional Countries.

Pre-transitional Countries		Related element of access							p-value
		Cognitive	Psycho-social	Cognitive & Quality	Geographic	Affordability	Perceived low fecundability	Other	
Chad	Baseline	22.4	27.5	16.4	0.3	2.8	19.7	11	
	Endline	14.4	21.6	8.6	0.5	1.8	43.8	9.3	
	Change	-7.9	-5.9	-7.8	0.3	-0.9	24.1	-1.7	0.000*
DRC	Baseline	15.9	17	21.6	1.1	5.1	30.8	8.6	
	Endline	12.6	19.3	21.5	1.4	2.4	35.4	7.4	
	Change	-3.3	2.3	-0.1	0.3	-2.7	4.6	-1.2	0.085
Mozambique	Baseline	7.2	12.7	11.7	6.6	2.6	47.7	11.6	
	Endline	1.6	26.7	8.8	4.5	6	47.4	5.1	
	Change	-5.6	14	-2.9	-2.1	3.4	-0.3	-6.6	0.000*
Niger	Baseline	19.6	25	19.2	3.8	3.9	17	11.5	
	Endline	5.8	35.6	12	4.2	1	35.7	5.7	
	Change	-13.8	10.5	-7.1	0.4	-3	18.7	-5.8	0.000*
Cameroon	Baseline	15.8	10.5	11.5	0.4	3.3	39.7	18.8	
	Endline	12.6	13.2	20.6	0.7	8.1	32.1	12.7	
	Change	-3.2	2.7	9.1	0.3	4.8	-7.6	-6.1	0.000*

Note: Countries marked with * are where the difference is statistically significant at the 0.05 level.

Table 3b. Difference (% point) in reasons for not using contraception between baseline and endline by country for women 15–49 with unmet need in Transitional Countries.

Transitional Countries		Related element of access							p-value
		Cognitive	Psycho-social	Cognitive & Quality	Geographic	Affordability	Perceived low fecundability	Other	
Dominican Republic	Baseline	0.9	16	26	0.5	1	41.1	14.5	
	Endline	0.6	17.8	32.5	0.7	0	37.3	11	
	Change	-0.3	1.8	6.5	0.2	-1	-3.8	-3.4	0.000*
Egypt	Baseline	0.1	11.6	33.3	0.1	0.6	51.3	2.9	
	Endline	0.2	12.7	36.6	1.1	0.9	47	1.7	
	Change	0.1	1	3.2	1	0.3	-4.4	-1.2	0.002*
Ghana	Baseline	5.2	15.8	38.5	0.5	3.4	29.6	7	
	Endline	1.1	15.2	43.9	4.6	5.1	24.5	5.7	
	Change	-4.1	-0.7	5.4	4.1	1.7	-5.1	-1.3	0.000*
Indonesia	Baseline	0.8	3.7	31.1	0.5	5	39.4	19.5	
	Endline	0.8	3.6	30.1	0.2	2.9	24.5	37.9	
	Change	0	-0.2	-1.1	-0.3	-2.1	-14.9	18.4	0.000*
Namibia	Baseline	3.8	10.8	25.6	3.3	5.3	27	24.2	
	Endline	1.2	10.8	22.5	4.7	8.9	25.7	26.1	
	Change	-2.6	0	-3.1	1.4	3.6	-1.3	1.9	0.000*

Note: Countries marked with * are where the difference is statistically significant at the 0.05 level.

Figure 1. Elements of access between baseline and endline by transition status, women 15-49 in all survey countries.

much more frequently reported at both baseline and endline as compared with PTCs. Finally, one difference between PTCs and TCs reversed course between baseline and endline. That is, *perceived low fecundability* reasons for non-use were higher among TCs at baseline and higher among PTCs at endline. These data indicate that common reasons for non-use among countries with stalled or increasing TFR vary by transitional status, as would be expected. Furthermore, even when TFR is stagnant or increasing, reasons for non-use are changing.

Finally, there are several trends in a subset of reasons for non-use that span nearly all study countries, regardless of transitional status. First, *cognitive* reasons for non-use are declining across study countries. This indicates that a core foundation of behavior change—knowledge—is becoming less of an impediment to FP access in countries with stagnant or increasing TFR. Second, *psychosocial* access barriers are stagnant or increasing across all study countries but for Chad. Even in Chad, *psychosocial* barriers still represent nearly 22% of all reported reasons for non-use at endline. Indeed, *psychosocial* barriers to contraceptive use are high at both baseline (average 15%) and endline (average 18%) across study countries. As these data show, another key element of behavior change—attitudes—has been and remains a major challenge for expanding contraceptive use among women who wish to delay or limit their next birth in countries with stalled or increasing TFR.

Turning to reasons for non-use related to *geographic* accessibility, the data show that geographic barriers to access are not frequently cited at either baseline or endline in study countries. Interestingly, while most countries saw little to no change in geographic reasons for non-use over time, Ghana witnessed an increase of four percentage points. *Affordability*-related reasons

for contraceptive non-use were also low across study countries at baseline and remained low at endline. The biggest shift was witnessed in Cameroon, which saw an increase in affordability-related reasons of nearly five percentage points. These data show that overall issues of *affordability* and *geographic* accessibility are not frequently cited by women living in countries with stalled or increasing TFR, indicating that other areas influencing family planning access may be of higher programmatic priority in these country contexts.

Finally, the reasons cited under “*other*”, which include “don’t know” also are decreasing across all study countries except Indonesia, which could be a signal that women are increasingly able to identify and describe their reasons for non-use. This finding could also be a reflection of changes in DHS core questionnaire answer codes, which have expanded over time to cover additional types of reasons, thereby reducing the need for “*other*.”

Conclusions

There are four broad trends emerging from our work. First, despite there being stalls or increases in TFR across study countries, unmet need actually increases or decreases depending on transition status with PTCs experiencing slight increases and TCs experiencing slight decreases. Second, while contraceptive knowledge is improving across all countries, the *cognitive* access gap remains very high between PTCs and TCs and must continue to be addressed in pre-transitional contexts. Third, *geographic* access and *affordability* are not prominent reasons women in our study countries cite for not using contraception, signaling other elements of access must first be addressed in order to reduce unmet need. Finally, our analysis indicates that there are certain access elements that require immediate programmatic attention: *Psychosocial* access and *perceived low fecundability*

are the main access barriers to address in PTCs while *cognitive and quality* access barriers are paramount in TCs. We use this opportunity to discuss several programmatic actions required to address these barriers to family planning access and use.

To overcome *psychosocial* barriers, it is critical to continue investing in social and behavior change, especially as related to men's involvement and engagement. Male engagement in family planning ([Abdur-Rahman et al., 2018](#)), acknowledging men as actors rather than mere bystanders ([Hardee et al., 2017](#)), dispelling common misconceptions about family planning ([Kabagenyi et al., 2014](#); [Muanda et al., 2016](#); [Withers et al., 2010](#)) and training providers on new methods like no-scalpel vasectomy and other male-friendly family planning services as under the successful *Permanent Smile Campaign* project in Ghana ([Subramanian et al., 2010](#)) are critical to addressing high and persistent unmet need in countries experiencing fertility stagnation.

While some *cognitive and quality* access barriers require social and behavior change interventions—like addressing widespread myths and misperceptions ([Gueye et al., 2015](#))—many others require improvements in service delivery environment, especially as related to effective counseling and method choice. For example, [Machiyama & Cleland \(2014\)](#) find that Ghanaian women – particularly urban educated women – may have a resistance to using hormonal contraception due to past experience with side effects, leading to reliance on traditional and less effective contraceptive methods instead. Another recent study in Bangladesh found that many women discontinued contraceptive use due to the negative impact contraceptive side effects had on their participation in various life activities, especially the impact of irregular bleeding on religious life ([Jain et al., 2017](#)). To address *cognitive and quality* issues impacting access, enhanced programmatic action is especially needed to: a) expand method choice among a wide variety of contraceptive methods and support method switching, recognizing that side effects are real and represent real problems; and b) enhance counseling and information exchange to with women and men on how to use methods and what to expect while using them, to dispel myths, and explain and address side effects.

Perceived low fecundability is a major reason for non-use cited by women across all ten study countries. High levels of perceived low fecundability may reflect a low awareness of one's risk of pregnancy. This is particularly important for postpartum women who do not often have correct knowledge about return to fertility. Indeed, unmet need is as high as 65 percent among postpartum women ([Gaffield et al., 2014](#); [Pasha et al., 2015](#)). Evidence from 17 countries shows that the return of menstruation is the only marker associated with increased modern contraceptive use among postpartum women ([Borda et al., 2010](#)), which leaves a window of time that women may be susceptible to an unintended pregnancy.

Given that the DHS continues to be the main source of information on contraceptive non-use in developing countries, it is important then to ensure that household surveys like the DHS are able to better capture the reasons women are not using contraception. As [Staveteig & Juan \(2018\)](#) suggest, the DHS women's questionnaire could contain better probes to capture a) whether women are underreporting traditional method use and b) sources of their information about perceived side effects – own, those of their friends, etc.

Our analyses reveal that indeed, lack of change at the population-level can mask important changes at the individual level. We remind programmers and policy makers that even in context of TFR stagnation, underlying attitudes, norms, and barriers to contraceptive uptake are shifting and programmatic action must shift accordingly.

Data availability

Source data

Data used in this study is available online from the [Demographic and Health Survey \(DHS\) website](#). The relevant datasets, available under the 'Individual Recode' subsection, are:

- Cameroon (2004, 2011)
- Chad (2004, 2014)
- Democratic Republic of Congo (2007, 2013)
- Dominican Republic (2007, 2013)
- Egypt (2008, 2014)
- Ghana (2008, 2014)
- Indonesia (2007, 2012)
- Mozambique (2003, 2011)
- Namibia (2006, 2013)
- Niger (2006, 2012)

Data can be accessed by applying through the DHS website. Please see their [data access help page](#) for information.

Grant information

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Acknowledgements

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Current Peer Review Status: ? ✓ ?

Version 1

Reviewer Report 24 April 2020

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Kannan Navaneetham

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The main objective of this paper is to examine the reasons for non-use of contraception among women who desire to delay or avoid births in the context of stalling fertility using data from Demographic Health Surveys (DHS) of 10 countries. This paper also tried to draw inferences about how the reasons for non-use of contraception vary between pre-transitional countries (PTC) and transitional countries (TC). Understanding the dynamics of unmet need for contraception and the reasons for not using it is a programmatic importance and have policy implications for the implementation of family planning programme in developing countries. However, I have a major problem with this paper with respect to analytical content, data analysis and interpretation.

General comments:

- The analysis could have at the disaggregated level of women who desire to delay and avoid births, that is separate analysis for reasons for non-use of contraception for spacing and for limiting. This is because the reasons for non-use of contraception would vary depending whether the women want to delay or avoid births. If women want to delay the births, the reasons for non-use of contraception mostly pertaining to spacing methods and if they want to avoid births their reasons could be pertaining to terminal methods. The analysis done without disaggregating this way may be problematic and hide important information.
- Various demographic and socioeconomic factors are contributing for a woman to delay the births or to avoid births. The most important demographic factors are age and parity. The age and parity distribution are different between the PTC and TC, without controlling these factors, may tend to have erroneous conclusion. My question is whether we can make meaningful comparison on the reasons for non-use, if those countries are different with respect to age structure, parity distribution, distribution of family planning method use, variation of cultural beliefs and norms etc. Literature shows that most unmet need contribute from women who wish to postpone the next birth in Sub-Saharan African countries, whereas in Asia and Latin America unmet need results primarily from those who want to terminate childbearing. These differences would have implications on interpreting the results of reasons for non-use of contraception.

Now I outline below the specific comments in each of sub-heading of the paper.

Introduction:

There are numerous studies in developing countries either stand alone or in a comparative perspective which addressed the reasons for non-use of contraception among women with unmet need. The most important one is by Sedgh & Hussain (2014)¹, as this paper also cited. I am unable to figure out from the introduction, what is the motivation for this paper and how it is deviating from the earlier studies and findings, for example from study by Sedgh & Hussain (2014)¹. Previous studies have also reported how the reasons vary between high fertility and low fertility countries. However, it is unclear, why the authors want to compare between countries with stalling fertility of high and low? What are the existing knowledge gaps? What the author is hypothesizing or why author expects that reasons could be different between these two set of countries. How the paper is going to add value into the existing literature. What is the critical research problem here in the context of stalling fertility decline? The introduction needs proper motivation and contextualization of research problem.

Methods

The study selected 10 countries and among them five are from PTC and another five from TC. The criteria for selecting these countries are:

1. with at least two DHS conducted since 2000 with final datasets available as of March 2018.
2. limit analysis to those countries that have stalled or increasing TFR point estimates above replacement level (e.g. TFR > 2.1).

The selection of countries using above criteria seems to be arbitrary. Regarding criteria (a), the paper did not give any justification or rationale for the cut-off year 2000 for choosing the countries. Why not before 2000? What is the significance of this year? I suggest that the authors should indicate the justification for this.

The countries selected are:

Five TCs: Dominican Republic, Egypt, Ghana, Indonesia, and Namibia; and

Five PTCs: Cameroon, Chad, Democratic Republic of Congo, Mozambique, and Niger

The paper does not give rationale and procedure for choosing these countries in PTC and TC. To be specific, how those countries were selected? In total, how many countries the fertility was stalling? From those countries, how you finally arrived to select these countries? Further, in both groups, all countries are from Africa except Indonesia and Dominican Republic. Why Indonesia and Dominican Republic were chosen for the analysis? Are there any specific reasons? Are those countries being homogeneous or heterogeneous in certain characteristics (for example supply side factor, similar strategy for the implementation of family planning programme, cultural factor, religious factors, or any other factors). If so, how and why. I would appreciate specifying rationale for the selection of the countries within the group, apart from fertility stall.

The inclusion criteria used for the study population is: "women ages 15-49 who report themselves as ever having had sex, not currently pregnant, not currently using a contraceptive method, and who are clear about their desire to either limit or space future births". However, this criterion is different from algorithm used for estimating the unmet need. Not clear, all women or only ever married women were selected. The note no. 2 in the paper says that *only ever-married women are interviewed in a subset of countries in Asia, North Africa, and Middle East due to cultural sensitivities*. Need some clarification. Suppose all women were selected, combining unmarried women and

married women, and understanding reasons for non-use of contraception may be problematic. In Africa, one-fourth of the unmet need women are from unmarried women and the reasons for non-use expected to be different.

Women ever having had sex may not be currently sexually active. The algorithm used for estimating unmet need includes currently pregnant and amenorrheic women if they say that their current or last pregnancy was unintended. But why you have excluded currently pregnant women. What about infertile women? Are they excluded? Need more clarification on the filtering of the study population.

The main variable is women's self-reported reason(s) for not using any method of contraception. Eligible women are asked an open-ended question (q709), "Can you tell me why you are not using a method to prevent pregnancy?" The major limitation of this question is that it is a self-reported and very subjective in nature. The information from this question should be used cautiously. Studies have shown that women are reluctant to identify their own ignorance as a reason for non-use as it may doubt their self-respect (Cleland, Harbison, and Shah, 2014²). The responses from this question is not consistent when compared with other information or other questions. For discussion on this review, refer to Cleland, Harbison, and Shah (2014)². The authors need to bring those discussions and include the limitation of using these subjective responses for interpreting the results.

Baseline and End line years are different for different countries and intervals (ranging from 5 to 10 years) are different between countries. Are the results comparable among countries when different periods were used for studying change? The authors should justify how the results are not affected by these variations in the duration.

Results and Discussion

It is interesting to note that the mean ideal number of children has not changed much during the base year and end year in both PTC (an average of 6.9 children during the period) and TC (an average of 3.2 children). Consequently, the fertility has not declined, and it was stalling in these countries. This implies that the main factor for stalling fertility in these countries was due to constant desired family size driven by poor female education, greater benefits of having more children and lack of modernization. In this context, these factors are more important for considering policy relevance for socioeconomic development whereas unmet need and their reasons for not using contraception could be less important for discussion and deriving policy priorities for family planning. The paper needs through discussion on these aspects. I suggest that results section should start with the selected characteristics of the study population and discussion on how these characteristics vary between countries. A table can be given. Because these differences will have implications on the interpreting the results of reasons for non-use of contraception.

Table 2a gives the unmet need for base year and end year and changes over the period. The definition and measurement of unmet need in the DHS surveys have changed over time (Bradley et al., 2012³). Whether an adjustment on the estimation of unmet need was made for comparing between countries and over the time period? Need clarification on this. It is interesting to note that Ghana, the TC with the total fertility rate of about 4 children per woman and contraceptive prevalence rate of 25%, has higher unmet need compared to all the PTC with the TFR of more than 6 children. Similarly, Niger has low unmet need but high fertility. Probably, lower fertility in Ghana

could be attributed due to abortion prevalence in the country compared to PTC. It could be that the desired family size in Niger is larger and therefore policies related to reducing unmet need may not be central importance than improvement in socioeconomic development in the country. Need more discussion on these nuances in a comparative perspective.

The table revealed that there is a variation on the reasons for non-use within PTC and TC. For example, psychosocial barrier is higher in all the PTC countries except Cameroon where it is closer to TC countries. The author has not brought this type of differences within the group of countries and explanation of those variation.

The authors should be cautious in interpreting the table. I quote from the paper "In Ghana, service-related barriers to use are becoming more prevalent, with *cognitive and quality access*, *geographic access*, and *affordability*-related reasons for non-use increasingly representing a larger proportion of reasons for non-use". I suggest the authors to check the table and interpret correctly. According to the table 3a, the dominant reasons in Ghana are *cognitive and quality access*, *perceived low fecundability* and *psychosocial*.

In some of the countries, majority of the women reported, particularly Indonesia and Namibia, as *other reasons, which include don't know* (about one-fourth). Unfortunately, we do not know what those other reasons are. It would be also interesting to see who those women are and what are their characteristics.

The findings are not new, and conclusion is vague and some of the explanations are superfluous not supported by the evidence.

In sum, the paper is weak both analytically and technically. This paper needs considerable revision. I hope my comments would be helpful to the authors to improve the quality of the paper.

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

Partly

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

Partly

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

Yes

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

Partly

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

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Demography, Health and mortality, Population and Development, Fertility and Family Planning

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

Reviewer Report 20 March 2020

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Mellisa Withers

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Thank you for the opportunity to review this manuscript, which explores reasons for unmet need for contraception in 10 countries where fertility transitions have not begun or where they have stagnated. Overall, I thought the manuscript was well-written and the study methodology was sound. Further reduction of TFR, especially in PTCs, can have numerous benefits and the results of this study could have important policy implications. As the authors highlighted, using national or population-level data can mask important findings at the individual level. Therefore, I thought this study was useful and has many strengths. I thoroughly enjoyed reading it.

Here are my specific comments:

1. I appreciated the use of DHS data from 10 countries, half of which have not experienced fertility declines and half of which have stagnated. I also thought the use of the 2 recent DHS surveys to look at changes over time in terms of reasons for non-use of contraception was interesting. I thought separating the countries into PTC and TC was useful because the factors that may influence non-use of contraception can be quite different. And, in fact, this was one of the major findings of this study.
2. The authors did a commendable job in reporting on the existing literature and theoretical frameworks used to explain fertility transitions.

3. The methods were clearly stated and the variables were adequately defined.
4. The study uses DHS data from 10 countries. As we know, the DHS data have many limitations. One of the most significant limitations relevant to this study is that it is difficult to measure fertility intentions using surveys with close-ended response categories. Offering simple response options (yes, no, unsure) does not adequately measure the complexity of this decision. Fertility decisions are often made based on a range of social, economic and contextual factors that may change significantly over time. One major limitation of the data is that it is difficult to assess whether the originally reported fertility intention and the self-reported reasons for non-use of contraception adequately reflected the true range of potential reasons or if they reflected response bias. For example, lack of rapport with the interviewer may have increased social desirability bias. The fact that only one reason was given by the majority of women may be an indication that this bias was present. Differences in survey administration may also be factors. However, the authors did a good job in working with the data that were available in the DHS (with all of its challenges) to overcome some of these issues, or at least acknowledge them.
5. While the authors were clear about how they decided which countries fell into the category of “stagnant”, the TFR in these countries and the background behind the fertility lag is quite diverse. For example, Indonesia experienced dramatic declines in TFR much earlier than many other countries. And as the DR and Indonesia’s TFRs are close to replacement level, I wonder if it would be worth highlighting that further reductions in countries such as this are going to be more challenging than reducing fertility in the countries with higher TFRs. Therefore, further disaggregating the data to identify target populations can help provide insight into where to invest more family planning resources.
6. There are many explanations for lack of contraceptive use which vary greatly in different contexts. This was highlighted in the introduction section. The results highlight that multi-dimensional programs are required to further reduce fertility rates. Clearly more work is needed in PTC with regard to information and education. However, relying on educational campaigns to encourage contraceptive uptake will likely not be successful without addressing other major barriers, such as opposition by male partners or fatalistic attitudes. This part of the analysis was the most interesting to me. In particular, that the results demonstrate the need to consider the impact of partner opposition, which has been cited in numerous studies as a major barrier to contraceptive use, especially in sub-Saharan Africa.
7. I found it quite interesting that, for most countries, the unmet need had not declined between baseline and follow-up. In fact, in half of the countries it had actually increased (Chad, DRC, Mozambique, Cameroon, Egypt). And only Indonesia, Ghana and Namibia had seen declines in unmet need of greater than 1% between baseline and follow-up. As the authors pointed out, the unmet need rates were highest among PTCs at both baseline and follow-up. These rates were the least likely to have changed. In terms of the results, the CPR did not change at all on average in TCs. And it had actually decreased by 2% on average in PTCs—to a low 15% at endline. This dismal figures show that high rates of unmet need persist and there is more work to be done. I wonder if there were cases of countries that have no change in terms of these variables—such as unmet need for contraception--without not falling into the PTC or TC countries included in this study. Would the reasons for non-use be similar for these countries? And if so, how would this translate into policy

recommendations in such countries? Maybe looking at persistent (or increasing) unmet need is even more critical than looking at stagnation in TFR? This was likely beyond the scope of this paper but would be worth exploring.

8. The perceived low fecundability as a barrier to contraceptive use is an interesting finding that is consistent with the literature that shows that a high rate of unintended pregnancy among postpartum women, for example. But it is hard to know if these women are in fact at high risk of pregnancy--was the DHS data for these groups is an accurate reflection (should they truly be counted in the group of unmet need for example?) Or is this another limitation of the data? If it is true, increased attention from family planning programs may be warranted among this group.

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

Yes

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

Yes

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

Yes

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

Yes

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

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Global sexual and reproductive health, gender-based violence

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

Reviewer Report 08 October 2019

<https://doi.org/10.21956/gatesopenres.14097.r27882>

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Thomas Spoorenberg

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The article offers an interesting analysis that tries to understand better the reasons behind the stalls in fertility levels in developing countries. Using Demographic and Health Survey (DHS) data, ten countries are selected; five that are in a pre-transitional situation (i.e. where the fertility transition is yet to start) and five other that are in transition but where the fertility decline stalled. The paper focuses on the investigation of the reasons women are not using contraception in these contexts. The analysis shows that the reasons for contraceptive non-use are somewhat distinct in pre-transitional and transitional countries with fertility stalls. Based on the results of the study, implications for program formulation and policy making are drawn.

While I like the idea of trying to understand better what could contribute to explain the fertility stalls (both when the total fertility rate has not been declining or when the total fertility rate has already started to decline), the article presents some issues that would need to be better addressed.

It is true that multiple studies have proposed distinct assessment and measurement of fertility stalls with varying level of robustness. Yet, most of these contributions stress the potential bias related to surveys' data quality that constitute the base to those endeavors. In this article, the way the authors have decided to operationalize fertility stalls - i.e. taking two point estimates n -years apart - is however too simplistic.

The countries included in the analysis are selected based on 2 criteria: 1) at least two DHS conducted since 2000 and with final datasets available as of March 2018; 2) countries that have stalled or increasing TFR estimates above replacement level. I would argue that both criteria are problematic.

While very useful, DHS data present some quality issues. It is well acknowledged that birth information collected in DHS are affected by birth omissions and/or birth displacements that affect the estimation of the fertility levels (among many, see Pullum and Becker, 2014¹; Schoumaker 2014²). For various reasons, the extent of these biases differs between countries and from one survey to the next. Hull and Hartanto (2009³) have also shown for Indonesia that the population included in the DHS sample is biased. I would invite the authors to discuss some of these points and how they affect the analysis conducted. The issues of data quality are therefore affecting the identification of fertility stalls. While such issues are much less discussed in studies focusing on contraceptive use, similar biases could also affect the estimation of contraceptive use/non-use. For example, the estimates and projections of family planning indicators 2019 published by the United Nations Population Division (https://www.un.org/en/development/desa/population/theme/family-planning/cp_model.asp) illustrate some inter-survey variability. It would be good if the authors could discuss in more details in the 'Methods' section some of these biases.

The reason why I think a more thorough discussion of these issues is important is because some of the variations that are presented and discussed in the paper - variations on which programmatic implications are drawn and policy recommendations are made - could be the product of differences in the data quality from one survey to the next, rather than revealing real changes at work.

In addition, when presenting the results of the changes in unmet need, contraceptive prevalence, etc., the study relies only on point estimates without providing confidence intervals (CIs). The values presented are drawn from sample surveys, therefore it would be indicated to present them with CIs. To note, CIs are provided for TFR estimates in Table 1. In passing, I would like to bring to the attention of the authors that if the TFR value of the upper limit of the CI are taken in the baseline sample survey and the TFR value of the lower limit of the CI for the endline sample survey, some countries would not be selected as experiencing stalling fertility. I bring this point forward in the perspective of the discussion above and as well as a further illustration of the too simplistic rule used to select the countries with stalling fertility.

In line with the points made herein I would advise the authors to use the recent article of Schoumaker (2019⁴) that offers one of the most exhaustive and authoritative treatments of assessing and estimating fertility stalls. I understand that this article was published after the initial submission of the present paper and could therefore not be included in the text. Yet, it would be good to refer to this new study in a revised version of the text. I would also recommend the authors to discuss in more depth how the several data quality issues affect the outcomes of their analysis.

A second important point is to what extent the results of the analysis are specific to the countries experiencing stalling fertility. Many other countries recorded similar changes in contraceptive non-use without displaying a stall in fertility. For example, in India, the latest 2015-2016 DHS (NFHS-IV) indicates a decline in contraceptive prevalence and an increase in unmet need but no fertility stall has been recorded in the country. Are the reasons identified for the group of countries with stalling fertility really specific to these countries? Similarly, are the differences in reasons for contraceptive non-use between pre-transitional and transitional countries identified in the study specific to countries experiencing fertility stalls? I expect that the reasons identified in the study are found in other countries where fertility has been continuously falling. In other words, the reasons for contraceptive non-use that the study identified do not explain why fertility has been stalling in the selected countries.

All in all, the study would benefit of a more thorough discussion of how data quality may affect the results, as well as a more critical assessment of whether the changes in contraceptive non-use, as well as the reasons for not using contraception, are really driving the fertility stalls in the selected countries.

References

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3. Hull T, Hartanto W: Resolving contradictions in Indonesian fertility estimates. *Bulletin of Indonesian Economic Studies*. 2009; **45** (1): 61-71 [Publisher Full Text](#)
4. Schoumaker B: Stalls in Fertility Transitions in sub-Saharan Africa: Revisiting the Evidence. *Stud Fam Plann*. 2019; **50** (3): 257-278 [PubMed Abstract](#) | [Publisher Full Text](#)

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

Partly

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

No

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

Yes

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

Yes

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

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Demography, Fertility, Population estimates and projections, Population and development, analysis of deficient demographic data and indirect demographic methods

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