

Dynamics of postpartum contraceptive use, and their relationship to antenatal intentions, in Northern Tanzania

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ABSTRACT

In Tanzania, unmet need for contraception is high, particularly in the extended postpartum period. Starting contraceptive counselling during antenatal care would reach 97% of pregnant women with much-needed information. Delivering effective and personalized antenatal counselling requires an understanding of the dynamics of postpartum contraceptive use, and their relationship to contraceptive intentions reported antenatally. Through a baseline survey of 5284 pregnant women in Mwanza, Northern Tanzania, and a follow-up survey at 6-15 months postpartum, we examine patterns and determinants of contraceptive use throughout the postpartum period, compare them to patterns of past contraceptive use and assess their correspondence with contraceptive intentions reported antenatally. We uncover new patterns in timing of uptake, method mix and discontinuation (particularly regarding the role of condoms), and highlight important determinants of postpartum contraceptive behaviour. We discuss the implications of these findings for antenatal contraceptive counselling, and suggest innovative ways in which they can inform contraceptive counselling initiatives.

INTRODUCTION

Unmet need for family planning (FP) is high in Tanzania, with 26% of reproductive age women wanting to avoid a pregnancy but not using any contraception. Unmet need is especially high in the extended postpartum period, reaching 30% at 12 months after a birth [1]. Efforts to address this postpartum unmet need should first seek to understand the specific patterns and determinants of contraceptive use in the postpartum period. Based on these patterns, practical and innovative ways to help address the unmet need for contraception can be devised.

In Tanzania, antenatal clinics are attended by 97% of pregnant women (a third of whose pregnancies are unintended), and would therefore provide a unique opportunity to reach sexually active women of reproductive age with FP information, both general and more specifically tailored to postpartum needs. Currently, contraceptive counselling is not offered during antenatal care in Tanzania; it is only provided at a 6 weeks postpartum visit which many women fail to attend, particularly if the clinic is far from home, and the baby is healthy. The well-attended antenatal care context is a missed opportunity to reach women who are otherwise difficult to access after the birth with much needed contraceptive counselling. Effective and personalised antenatal contraceptive counselling would have to rely on clients' reported intentions after the birth, which requires an understanding not only of postpartum contraceptive use dynamics, but also their relationship to antenatal contraceptive intentions.

This paper offers an in-depth analysis of the dynamics of contraceptive use and reproductive behaviour in the postpartum period in Northern Tanzania, the factors underlying the observed patterns, and their relationship to antenatal contraceptive intentions. Based on these findings, we discuss ways in which these dynamics can inform FP counselling guidelines in Tanzania, with a particular emphasis on antenatal counselling.

METHODS

A baseline survey of 5284 pregnant women was carried out in 15 government antenatal clinics in Mwanza region in Northern Tanzania, which encompassed highly urbanised areas such as Mwanza City (the second largest city in Tanzania) as well as remote rural areas. All women attending these clinics during the survey period were interviewed. Our study population therefore constituted a complete sample of antenatal clients in the catchment area during the study period. Nurses administered structured questionnaires to all women attending the clinics during the 5-month study period, collecting information on socio-demographic characteristics, reproductive and contraceptive history, future childbearing and contraceptive intentions. Twelve to fifteen months later, a follow-up survey of the baseline respondents (then 6-15 months postpartum) collected data on reproductive behaviour since the end of their pregnancy throughout the postpartum period (using a calendar tool), as well as information on reproductive intentions. The follow-up data was linked to respondents' baseline data using anonymous study numbers.

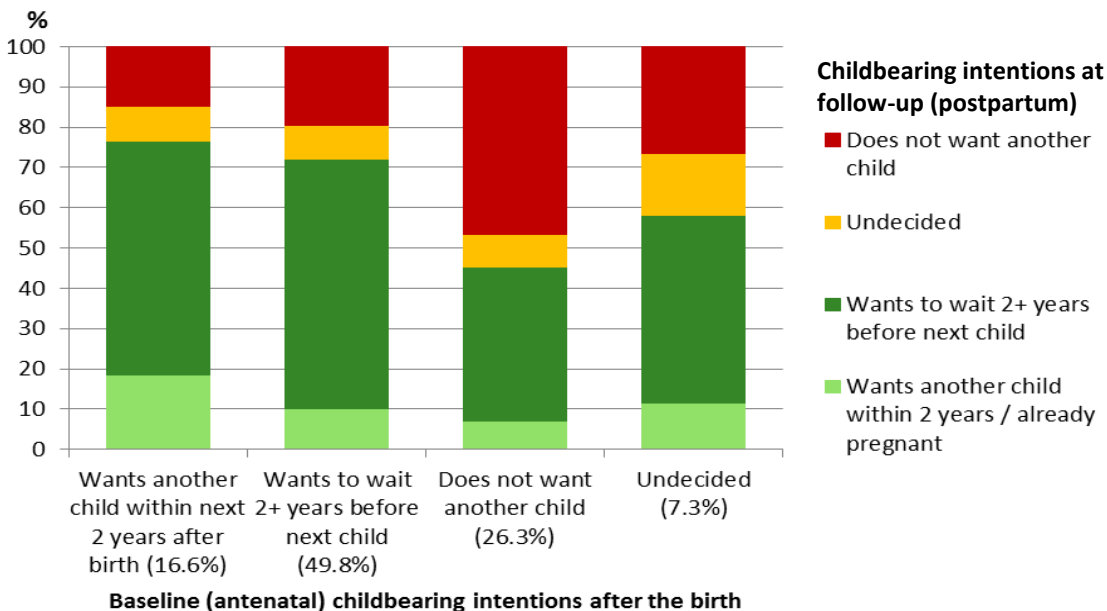
Analysis was carried out in STATA 11 [2]. Using Kaplan-Meier methods, we describe reproductive and contraceptive patterns throughout the postpartum period, and how they compare to postpartum contraceptive intentions voiced antenatally. Multivariate Cox regression models highlight factors associated with FP use in the postpartum period. Results are adjusted for clustering at the clinic level. Ethical approval for this study was obtained from the Tanzanian Medical Research Coordinating Committee and from the London School of Hygiene and Tropical Medicine Ethics Committee.

RESULTS

Demand for delaying births in the postpartum period

The need for FP in the postpartum period is high: at follow-up, only 8% of women wanted a child in the next 2 years, and 28% did not want another child at all. The mean intended birth interval before the next child was 47.7 months. Examining changes in childbearing intentions between baseline and follow-up, we see that postpartum childbearing intentions reported antenatally are poor predictors of postpartum reproductive behaviour: only 46% of childbearing behaviour or intentions at follow-up could have been predicted from the baseline survey (figure 1).

Figure 1. Childbearing intentions at follow-up according to respondents' reported intentions at baseline



It appeared that the event of the birth encouraged many women who wanted to stop childbearing at baseline to consider having another child eventually, while also encouraging those who wanted another child within 2 years to delay their next pregnancy. The net result was that more women wanted to avoid a pregnancy in the postpartum period than predicted at baseline. Consequently, FP needs in the first year postpartum, particularly for spacing, are underestimated based on antenatal intentions.

The high postpartum demand for delaying births was matched by a high proportion of women who intended to use FP (over 77%) both at baseline and follow-up. However, these intentions often did not translate into actual contraceptive use in the postpartum period. While 72% of women intended at baseline to start FP in the first year postpartum, only 40% had actually managed to (or still intended to) at follow-up, and many had delayed their intended contraceptive start time after they gave birth, so that 45% of respondents at follow-up wanted to wait till at least a year postpartum before initiating FP, compared to only 6% at baseline. The very fact that only 27% of the population had used FP in the past (compared to over 77% intending to) suggested that actual use is much lower than intended use.

FP use and its determinants in the postpartum period

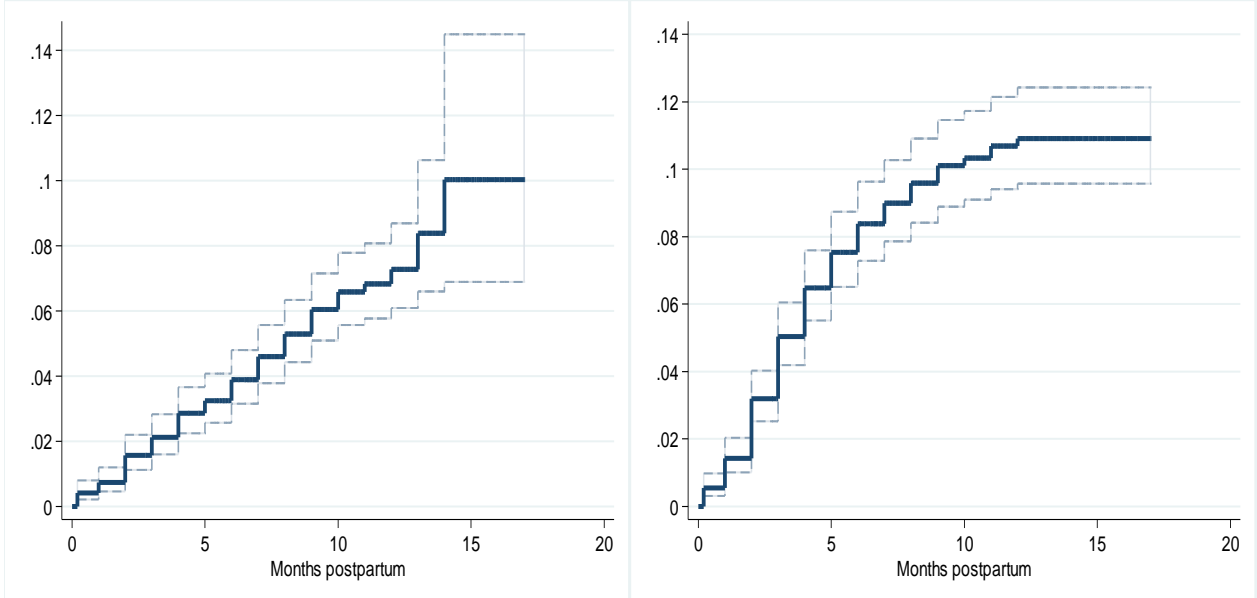
Nonetheless, 34% of respondents initiated FP in the postpartum period. The majority of postpartum FP users (25% of total sample) had started by 7 months postpartum. There were two “peak periods” in rates of FP initiation: one around 5-6 months (perhaps as the Lactational Amenorrhea Method is recognised as no longer protective) and one around a year postpartum (figure 2).

Figure 2. Hazards of FP initiation throughout the postpartum period



Comparing cumulative probabilities of having initiated FP by method type (figure 3), we see that while the probability of having initiated hormonal methods increased gradually throughout the postpartum period (as exemplified by pill initiation), condom initiation was concentrated in the first 6 months postpartum (with the peak rate of initiation at 4 months). After 6 months the probability of starting condom use levelled off markedly.

Figure 3. Cumulative probability of starting the pill (left) and condoms (right) throughout postpartum period



Sixty-nine percent of postpartum FP users had used hormonal methods, and 33% had used barrier methods (with a few having used both). The most popular method was the injectable, used by 37% of postpartum FP users (12% of total sample), followed by male condoms, used by 32% of FP users (10% of total sample). Postpartum condom use was much higher than condom ever use before the pregnancy (2%), and also higher than *intended* condom use at follow-up (7%). In contrast, intention to use all other methods at follow-up was higher than actual postpartum use (figure 4). This suggests a particular role for condoms in the postpartum period. As seen above, condoms tended to be started shortly after the birth, with the peak at 4 months, which is soon after the median timing of intercourse resumption in this sample (3 months). In fact, having resumed sexual activity was often given as a reason for condom uptake. In contrast, hormonal method initiation peaked at 6 months, and few women reported using hormonal methods because they had resumed sexual activity, but rather because they “did not want a child”. This suggests condoms are often used as a temporary postpartum contraceptive while women wait to start a hormonal method (after they finish breastfeeding, or their menses resume).

Figure 4. FP use and intentions at baseline & follow-up, by method (total sample)

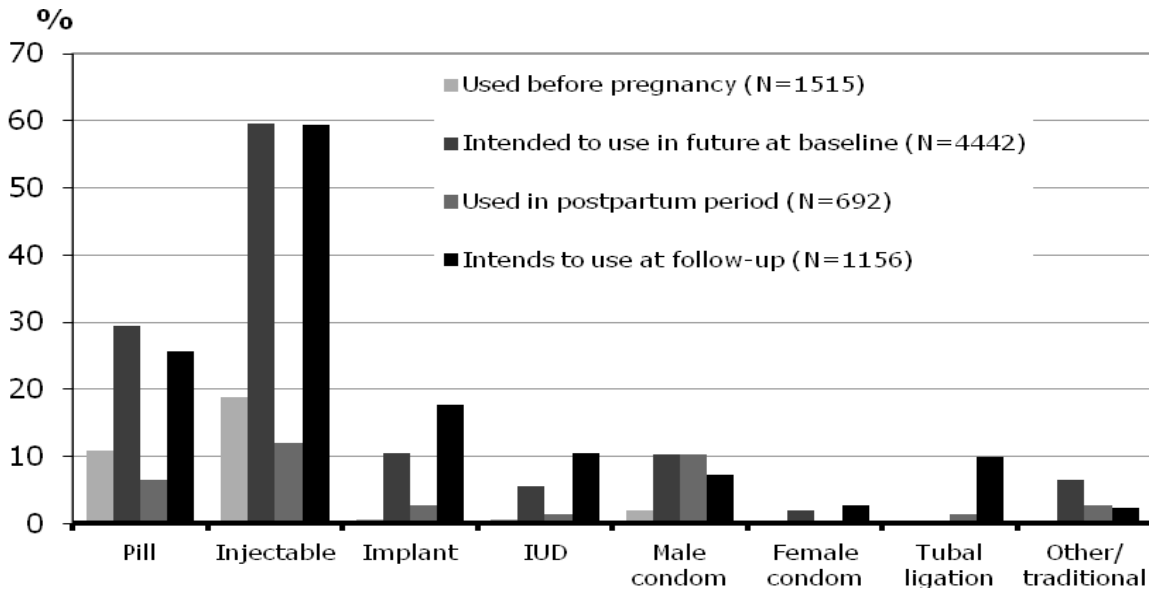


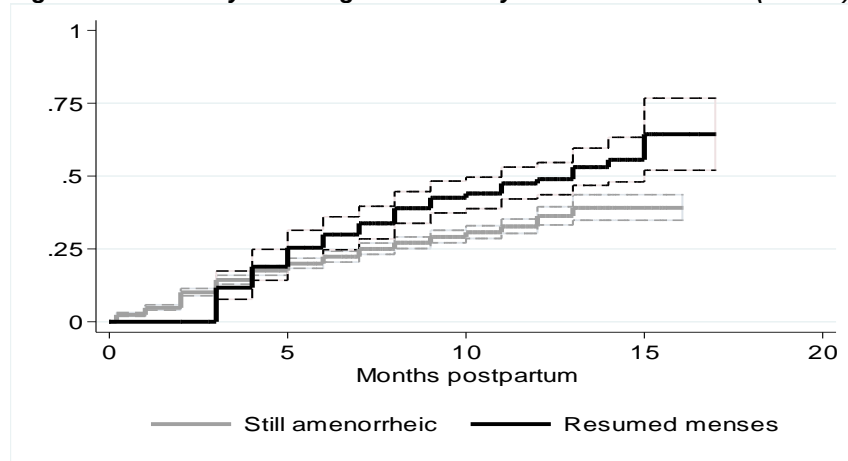
Table 1. Predictors of having used hormonal methods/IUD and male condoms during follow-up

	Hormonal methods/IUD			Condoms		
	Adjusted hazard ratio of hormonal use	Adjusted p-value for z	Adjusted Wald test	Adjusted hazard ratio of condom use	Adjusted p-value for z	Adjusted Wald test
Resumed menses	2.32 (1.65-3.26)	<0.001	$X^2=23.68, p<0.001$	0.69 (0.41-1.14)	0.145	$X^2=2.13, p=0.145$
Had ever used FP at baseline	1.92 (1.58-2.34)	<0.001	$X^2=42.68, p<0.001$	1.65 (1.30-2.09)	<0.001	$X^2=17.20, p<0.001$
<i>Marital status change between baseline and follow-up</i>						
Never married	0.45 (0.22-0.90)	0.024		1.26 (0.64-2.49)	0.509	
Still married	1.00			1.00		
Got married	0.97 (0.61-1.52)	0.878		0.93 (0.58-1.49)	0.753	
Got divorced/separated	0.56 (0.38-0.83)	0.004	$X^2=5.07, p=0.024$	0.71 (0.31-1.60)	0.406	$X^2=3.07, p=0.381$
<i>Parity</i>						
0-1 children	1.09 (0.84-1.41)	0.522		1.76 (1.32-2.35)	<0.001	
2-3 children	1.00			1.00		
4+ children	0.73 (0.53-0.99)	0.042	$X^2=5.43, p=0.066$	0.51 (0.32-0.83)	0.007	$X^2=21.14, p<0.001$
<i>Educational attainment</i>						
No education	1.00			1.00		
Incomplete primary	1.28 (0.86-1.91)	0.221		0.91 (0.46-1.82)	0.792	
Complete primary	1.30 (0.81-2.06)	0.274		1.04 (0.53-2.02)	0.912	
Incomplete secondary	1.38 (0.64-2.98)	0.416		1.60 (0.76-3.39)	0.219	
Complete secondary	2.09 (1.17-3.73)	0.013	$X^2=30.35, p<0.001$	1.93 (0.90-4.14)	0.089	$X^2=16.19, p=0.003$
<i>Childbearing intentions at follow-up</i>						
Wants child in next 2 years	1.00			1.00		
Wants child after 2 years	3.35 (1.57-7.12)	0.002		2.84 (1.15-6.98)	0.023	
Doesn't want another child	3.27 (1.41-7.57)	0.006		3.56 (1.30-9.78)	0.014	
Undecided	4.03 (1.74-9.33)	0.001	$X^2=10.74, p=0.013$	1.68 (0.55-5.15)	0.366	$X^2=13.61, p=0.004$

Shaded rows denote non-significant factors.

In support of the hypothesis that women wait for their menses to resume to start hormonal methods, Cox regressions show a strong association between menses resumption and hormonal method uptake, with hazards of initiating hormonal method use being 2.3 times higher after women had resumed menses (table 1). In contrast, no such association was found between menses resumption and condom uptake, with condom initiation being in fact non-significantly lower after resumption of menstruation (table 1). This lends support to the hypothesis that condoms are used as a temporary contraceptive method before the resumption of menses, after which they are replaced with hormonal methods. The relationship between menses resumption and hormonal method use throughout the postpartum period is shown in figure 5, where we see that the probability of having started using FP is significantly lower for women whose menses had not yet returned.

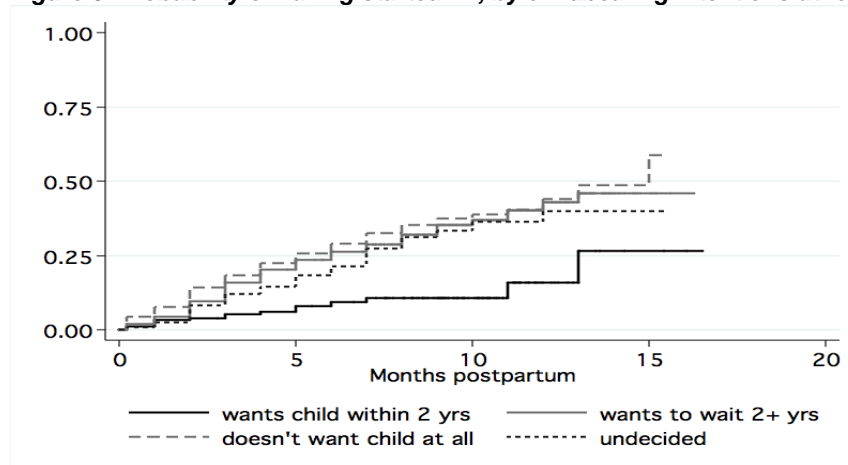
Figure 5. Probability of having started FP by menstruation status (95% CI)



Log-rank test for equality of survivor functions: $\text{Chi}^2=65.80, p<0.001$

As expected, cumulative probabilities of using FP were significantly higher for women who wanted to avoid a pregnancy (did not want a child in the next 2 years), but did not differ significantly according to intended timing of their next birth (table 1 and figure 6). Interestingly, the same pattern was observed for condom uptake, which was higher for women who wanted to avoid a pregnancy, whereas past condom use was not associated with childbearing intentions. This further confirms that condoms in the postpartum period had a clear role in pregnancy prevention, rather than (or as well as) in STI prevention. FP uptake in the postpartum period was also associated with lower parity and previous contraceptive use (for both condoms and hormonal methods), and higher education and being married for hormonal method uptake.

Figure 6. Probability of having started FP, by childbearing intentions at follow-up



Log-rank test for equality of survivor functions: $\text{Chi}^2=33.13, p<0.001$

Patterns of contraceptive discontinuation and method switching

18.8% of postpartum FP users discontinued use during the follow-up period, with 87% of the discontinued methods being barrier methods (mainly condoms): only 46% of condom users were still using this method at follow-up, compared to 90% of hormonal users. Overall, condoms tended to be used for a shorter time (median 1 month, 95th percentile 4 months) than hormonal methods (median 2 months, 95th percentile 9 months).

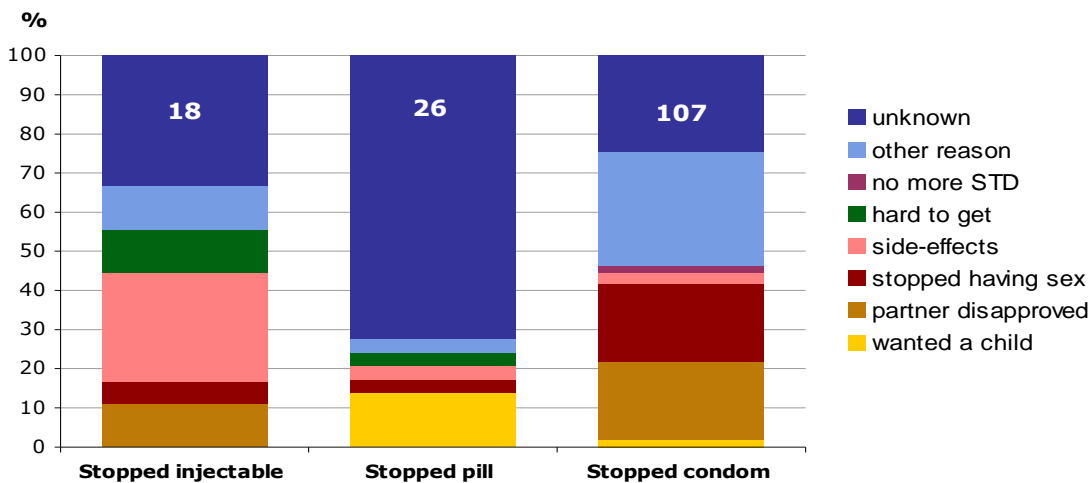
Eighty-two percent of contraceptive switching in the postpartum period was from barrier to hormonal methods: as many as 18% of barrier method users switched to hormonal methods, whereas only 0.4% of hormonal method users switched to barrier methods. The switch from barrier to hormonal method usually occurred around 6 months postpartum (mean 6.2 months), which corresponds to the time when the Lactational Amenorrhea Method (LAM) can no longer be relied on for contraceptive purposes. This lends further support to the hypothesis that condoms are used as a temporary postpartum contraceptive solution and back-up for LAM in this population.

Reasons for discontinuation

Unfortunately, reasons are missing or recorded as “other” for 37% of episodes of FP discontinuation, indicating major unidentified barriers to FP use. Partner’s disapproval of FP accounted for 32% of discontinuations. In contrast, concern over side-effects accounted for surprisingly little (6%), considering its importance as a reason for not using FP before the pregnancy (figure 9). This suggests that concerns over side-effects originate more in hearsay than actual experience. Interestingly, wanting a child was cited as a reason for stopping for only 4% of episodes of discontinuation (and FP discontinuation bore no association with childbearing intentions). This is not surprising given that only 8% of women wanted a child in the first 2 years postpartum. Consequently, it is likely that many women who stopped FP were subsequently experiencing unmet need.

An examination of reasons for stopping particular methods (figure 7) further illustrates the different functions of various methods in the postpartum period. The condom appears to be used by women who have intermittent sexual intercourse, and discontinued when they “stop having sex”. The pill appears to have a role as a temporary method to space births, which is discontinued once the desired pregnancy interval is reached and women “want a child”. In contrast, the injectable appears to be chosen by women who require a longer-term contraceptive method, and is only discontinued in the presence of major barriers (side-effects, difficulty of access and partner disapproval).

Figure 7. Distribution of reasons for stopping for the 3 most popular methods

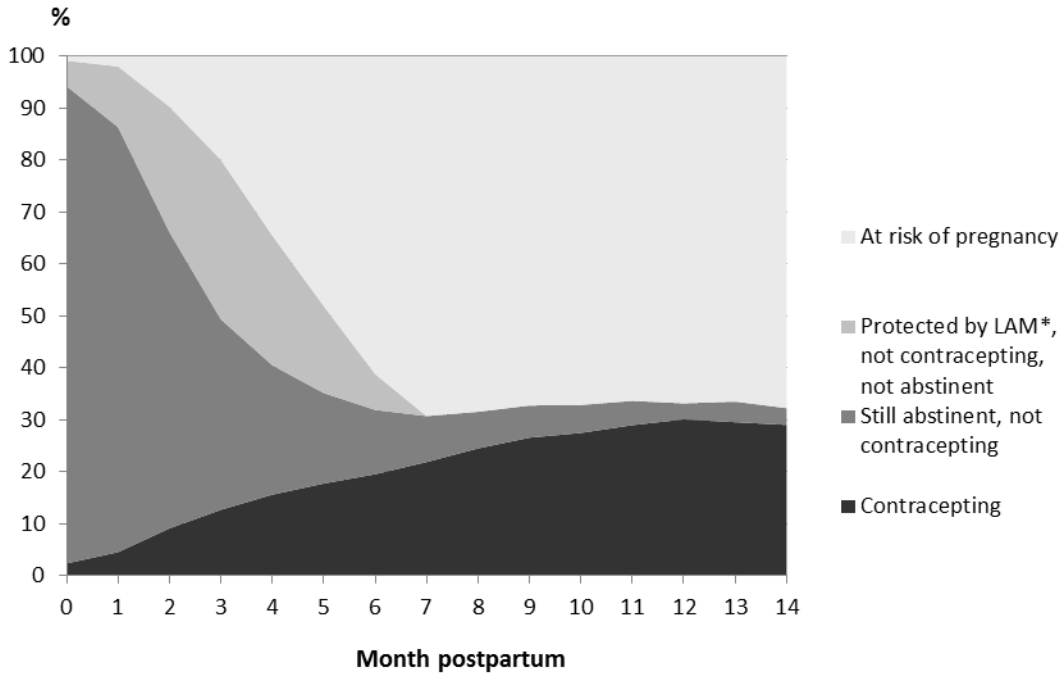


Labels indicate numbers who discontinued each method.

Unmet need for FP and repeat pregnancy risk

Unmet need in the postpartum period was particularly high: at follow-up, based on childbearing intentions, abstinence status and current FP use, 62% of women had an unmet need for FP (based on standard methodologies for calculating unmet need). This is much higher than reported unmet need before the baseline pregnancy (26%) and higher than the *estimated* postpartum unmet need based on respondents' childbearing and FP intentions at baseline (19%). This mismatch appears to be due to a tendency to delay FP uptake relative to the intended start time reported antenatally. Looking at unmet need longitudinally across the postpartum period, as the proportions of women who are abstinent and amenorrheic decrease with time, the proportion of women at risk of pregnancy increases (figure 8), reaching nearly 70% by 14 months. The great majority of these women wanted to avoid a pregnancy, but either started FP too late to ensure optimum protection or did not use FP at all, and 15% of these respondents who wanted to avoid a pregnancy did not even intend to use FP at follow-up.

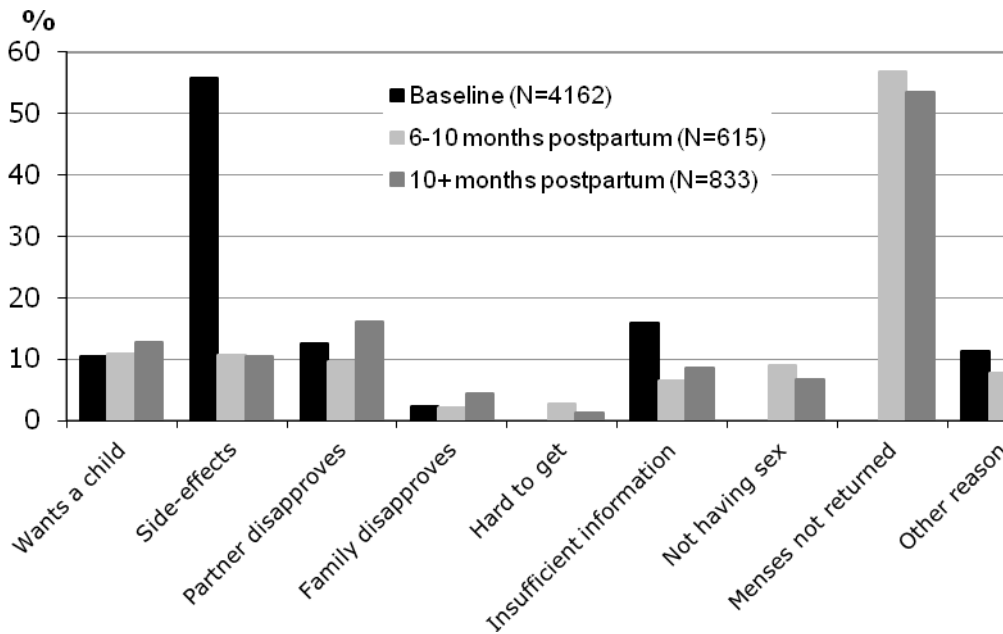
Figure 8. Cumulative proportions contracepting, still abstaining and using LAM, and proportions at risk of pregnancy, by month postpartum (excluding pregnant women)



As a result of this high unmet need, 36% of pregnancies in the postpartum period were unwanted or wanted later (compared to 28% of baseline pregnancies). Pregnancies occurred at a median of 6.6 months postpartum, which provides evidence for the increased pregnancy risk after 6 months postpartum.

Figure 9 presents reasons for not using FP before the pregnancy and in the postpartum period (divided into respondents 6-10 months postpartum and respondents over 10 months postpartum). The overwhelming reason for not using FP (even respondents over 10 months postpartum) was that their menses had not returned, which is in line with the baseline finding that less than half of women thought they could get pregnant while amenorrheic. Partner disapproval constituted the second most important reason for not using FP, accounting for 10-16% of non-use. Concern over side-effects was the third most common reason, and was by far the largest barrier to FP use at baseline, accounting for 56% of never use of FP.

Figure 9. Reasons for not using FP at baseline and follow-up



DISCUSSION

The need for FP in the postpartum period is high: only 8% of women wanted a child in the next 2 years, and 28% of the sample did not want another child at all. While the event of the birth encouraged many women who wanted to stop childbearing at baseline to reconsider their decision, it also encouraged those who wanted another child within 2 years to delay their next pregnancy, resulting in more women wanting to avoid a pregnancy in the postpartum period than predicted at baseline. This means that FP needs in the first year postpartum are likely to be underestimated based on antenatal intentions. These changes in childbearing intentions between baseline and follow-up highlight the importance of investigating actual postpartum reproductive behaviour in this population (rather than relying on postpartum intentions reported antenatally) when developing appropriate antenatal FP counselling guidelines tailored to postpartum needs. The rationale for offering a continuum of FP services between the antenatal and postpartum period is strong, as many women will not report a need for FP until after the birth, so services will have to be tailored to individual postpartum situations that are not predictable antenatally.

The high demand for delaying births in the postpartum period was matched by a high proportion of women who intended to use FP, but these FP intentions were often not translated into practice in the postpartum period, as also found in a DHS-based study of 27 countries [3]. This failure or delay in implementing FP intentions resulted in a high unmet need for FP, at around 62%. Very similar figures were found in a study of unmet need at 9-10 months postpartum in Nigeria [4], and in a multi-country study of DHS data on unmet need in the first year postpartum [3]. This high unmet need seemed to be due to a tendency to underestimate pregnancy risk, based on the assumption that amenorrhea offered complete protection against pregnancy regardless of time postpartum, and to not use adequate protection (despite intentions to at baseline). Indeed, the overwhelming reason for not using FP at follow-up was that menses had not yet returned. As a result, 36% of pregnancies in the postpartum period were unwanted or mistimed.

The lack of knowledge about pregnancy risk during amenorrhea has also been observed in other settings [4], and urgently calls for additional counselling on postpartum fertility. Giving this information as a routine part of antenatal care will provide an opportunity to inform women on postpartum fertility, breastfeeding and timing of postpartum contraceptive uptake before it is too late [5], and reach far more women than the current 6-week postpartum visit that many women fail to return for, reducing the need to re-establish contact after delivery [6]. This is particularly crucial for women who are unaware that they are susceptible to pregnancy before their menses return, as they may see even less reason to return for postpartum care (especially if their baby is healthy and they live in a remote area). A systematic review of studies evaluating the effect of contraceptive education on postpartum contraceptive uptake found that interventions offering

contraceptive information over multiple sessions were effective in increasing postpartum contraceptive use [7]. However, it is important that counselling be continued in the postpartum period, since many women will not report a need for FP until after the birth, and there is mixed evidence on the effectiveness of contraceptive information provided antenatally without postpartum follow-up in increasing postpartum contraceptive uptake [8, 9], most likely because of the extended period of time between the counselling and the moment at which this information becomes relevant.

The analysis of patterns of FP use by method revealed some interesting patterns. Male condoms were used by over 10% of total respondents postpartum, which was much higher than condom ever use at baseline (2%) and intended future use (7%). This indicates a particular role for condoms in the postpartum period. Compared to hormonal methods, condoms tended to be started sooner after the birth, were used for a shorter time, and were much more likely to be discontinued or swapped for a hormonal method (usually around 6 months). This suggests condoms are used as a temporary postpartum solution (or back-up method for LAM) while women wait for their menses to resume before starting a hormonal method, as further supported by the strong association between menses resumption and postpartum hormonal method uptake (no such association was found with condom uptake). Condoms have also been found to be popular postpartum contraceptives in a study in Nigeria [10]. As condoms are easier to access locally than hormonal methods, and can be used immediately without consulting a FP provider, they offer a good intermediate contraceptive method between resuming sex and being prescribed a hormonal method.

The popularity of condoms for pregnancy prevention in the postpartum period can be capitalised on, particularly in a setting with a generalised HIV epidemic where condoms are usually associated with promiscuity and STIs. Although women still experienced partner disapproval over condom use, condoms appear to have a higher acceptability in the postpartum period than at other times. Focusing on the contraceptive benefits of condoms could help lay the foundations for increasing their acceptability at other times, and has been suggested as an effective condom promotion strategy by others [11, 12]. Studies have found that condoms for pregnancy prevention were gaining popularity in other parts of Africa [13], and were sometimes used more effectively than when used for STI prevention [14].

The postpartum period also displayed particular patterns with regards to other methods: the pill seemed to be used by women as a temporary method to space births and discontinued when they wanted a child, while the injectable was used by women who required a longer-term contraceptive method and only discontinued in the presence of major barriers (side-effects, difficulty of access, partner disapproval). The identification and elimination of such barriers to sustained FP use is key to reducing the high unmet need in this population.

Partner disapproval also constituted the second most important reason (after amenorrhoea) for *not* using FP in the postpartum period. Unfortunately, the issue of partner disapproval is difficult to address in antenatal FP counselling. Couple counselling holds the highest potential for tackling partner disapproval [15, 16] and increasing condom use [17], but opportunities for this in the antenatal context are limited, as antenatal clinics are traditionally female territory [18-20]. Offering this in the context of HIV couple counselling (which would enable the integration of services) would have to take into consideration additional issues of HIV status disclosure which make couple counselling far from straightforward [21]. Referring women for a FP couple counselling session after their antenatal visit might reach some men with FP information, but it is likely that many referred couples would not make it to these sessions (just like many women do not attend postpartum sessions), especially as the distant prospect of FP may not be a priority for couples during the antenatal period. In contrast, offering *routine* FP counselling as part of antenatal services does not rely on women's motivation to use FP, and reaches even those who have never considered FP.

Another strategy for tackling partner disapproval is targeting men in other settings, for example voluntary counselling and testing clinics (VCT), especially as VCT clients may have a stronger health-seeking behaviour, which may make them more receptive to FP. There is a growing body of research into integrating FP into VCT [6, 22-29]. FP media messages (leafleting and radio) targeted *specifically* at men could also help tackle partner disapproval, particularly as evidence suggests men are receptive to written forms of postpartum contraceptive information [30]. Since a major reason for partners' disapproval appears to be men's higher childbearing desires (as found in our study, data not shown), FP information could build on these attitudes rather than challenge them, and focus primarily on the benefits of spacing births for the health of the children and the mother (ultimately allowing larger families). However, this does not obviate

the need for more research into the roots of men's high fertility desires, so that interventions can be developed to tackle the factors underlying these high desires in settings where they pose a barrier to the realisation of women's reproductive rights.

Side-effects were the third most frequently mentioned reason for not using FP postpartum, and by far the largest barrier to FP use at baseline. However, side-effects played a negligible role in FP discontinuation, suggesting fear of side-effects originates more from hearsay than first-hand experience. Given the importance of informal channels of peer advice in spreading FP information, these could be harnessed to disseminate accurate information and promote FP beyond the counselling session to the rest of the community. Distributing take-home information (such as leaflets) to women during counselling may be a good way to capitalise on peer information channels by enabling women to share information that does not rely on them accurately recalling what they were told. This strategy (although limited to areas of relatively high literacy) would also help address the barrier of "insufficient information", the second reason for not using FP at baseline.

This study has highlighted some of the factors influencing contraceptive uptake in the postpartum period, enabling us to suggest ways in which to address the high unmet need for family planning in the 15 months after a birth in Tanzania. While interesting dynamics of contraceptive use were identified, it was striking that observed postpartum contraceptive use and intentions bore very little relationship to the postpartum intentions voiced by these respondents antenatally, and likewise with childbearing behaviour. This suggests that reproductive intentions are fluid around this liminal birth period, shifting according to individual circumstances surrounding the pregnancy and other personal factors. The effect of some of these circumstances and factors on postpartum contraceptive use can be statistically predicted, but other factors remain obscure and poorly understood. This highlights the impossibility of devising universal guidelines for antenatal contraceptive counselling, and emphasises the need for a continuum of contraceptive services that are tailored and responsive to each woman's individual trajectory from the antenatal to the postpartum period.

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