Postpartum contraceptive use in rural Mozambique: Individual, household, and institutional determinants

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Abstract

The paper examines family planning itineraries of rural women in southern Mozambique, with a special focus on contraceptive uptake in the postpartum period. It is based on the first wave of an ongoing retrospective-prospective study of 285 HIV+ and HIV- women systematically selected from the lists of those who gave live births in four rural maternity clinics in 2011-12 and surveyed about 22 months after their deliveries. We use event-history analysis to model women's contraceptive initiation from their sociodemographic characteristics and characteristics of their households. To complement individual and household perspectives on family planning with an institutional one, we used data on women's physical access to maternal and child health services and their exposure to family planning counselling during the antenatal and perinatal period.

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Introduction

Despite considerable overall advances in the provision of family planning services throughout rural sub-Saharan Africa, contraceptive use remains low (Khan et al. 2007; UNDP 2009). In fact, in some countries contraceptive prevalence has recently stagnated and even declined, and unmet need in the region remains highest in the world (Cleland, Harbison, and Shah 2014), with less the half of sub-Saharan women who said that they would like to stop or postpone childbearing using contraception (Sedgh et al. 2007). As a result, unintended pregnancies are common (Singh et al. 2010). Postpartum contraceptive use is particularly low. It is often hindered by what is said to be traditional practice of prolonged post-partum abstinence; accordingly, health care providers rarely encourage couples to start contraception early because of perceived low risks of conception. Besides, the benefits of antenatal and early postnatal contraceptive advice for postpartum contraceptive uptake area still debated (e.g., Glazer, Wolf, and Gorby 2011; Engin-Üstün et al., 2007; Smith et al. 2002). Yet post-partum contraception has considerable potential in preventing unwanted or mistimed early repeat pregnancies, especially in a context of rapidly eroding traditional post-partum practices. Moreover, prenatal and perinatal periods, when many women are typically in frequent contact with health providers, offer ideal opportunities for effective family planning counseling.

The setting

The data used in the study come from a survey of 285 rural women in Chibuto District in Gaza Province in southern Mozambique. A former Portuguese colony that gained independence in 1975, Mozambique was mired in a devastating civil war for the first decade and a half of its independent existence. Since the end of the war in 1992 and the introduction of structural reforms in the early 1990s, Mozambique has experienced robust macroeconomic

growth. Despite this growth, however, Mozambique remains one of the world's poorest countries, with an annual GDP per capita below USD 600 (World Bank 2013). Mozambique is also among the world's most affected countries by the HIV/AIDS epidemic, with the national HIV prevalence of 12-16% of the adult population, depending on the estimates; the province of Gaza, where data for this study was collected, has the highest estimated HIV infection rate in the country, 25-27% of adults aged 15-49 and as high as 30% among women of that age range (Ministry of Health 2008; 2010).

Fertility in Mozambique is high; in fact, Mozambique is one of the sub-Saharan countries where fertility has stagnated or increased in the first decade of the 21st century. Thus, according to the three DHS, the total fertility rate (TFR) was 5.6 in 1997, 5.5 in 2003, and 5.9 in 2011 (Instituto Nacional de Estatística 2013: 75). In Gaza province, the DHS data suggest a slight decline of TFR: from 5.9, to 5.4 in 2003, to 5.3 in 2011 (Instituto Nacional de Estatística 2013: 76). According to the 2011 Mozambique DHS, modern contraceptive prevalence among women in union aged 15-49 was only 11%, the same level registered in the previous DHS conducted eight years earlier (Instituto Nacional de Estatística 2005: 71; 2013: 98). However, in Gaza province, it has been slightly higher than the national average, 18%, but has also remained unchanged between the two last DHS (Instituto Nacional de Estatística 2005: 72; Instituto Nacional de Estatística 2013: 100). According to the 2011 DHS, 97% of mothers abstained from sex during the first two months after birth, with this percentage declining to 53% at 8-9 months after birth (Instituto Nacional de Estatística 2013: 79).

The district of Chibuto, where data for this study was collected, is a typical land-locked, predominantly Christian district of Gaza province (see map in Figure 1). The majority of its population of about 200,000 lives in rural areas and is engaged in low-yield subsistence agriculture. The precarious nature of local agricultural production and proximity to South Africa, Mozambique's much more developed neighbor, has resulted in high rates of male

labor migration to that country (de Vletter 2007). In addition, the area has also been a source of migrants to other parts of Mozambique, especially the nation's capital city of Maputo.

At the time of data collection, there were 12 health clinics in the district that provided maternal and child health (MCH) and other medical services to the district's population. All these facilities are part of the National Health Service (NHS) network and provide all MCH services free of charge. The area has a relatively high coverage of institutional child deliveries—c.70% (Agadjanian et al. 2013); in addition, many of the women who happen to deliver outside a health clinic bring their newborns there for checkups and vaccinations early after the birth. Family planning has been provided at all these facilities for many years. Initial family planning counseling is typically done at prenatal consultations and then at the first postpartum checkup between 3-7 days after delivery. However, method-specific counseling is typically offered starting only at 4-6 weeks after birth (usually timed with the administration of the polio vaccine to the child). Dates of consultations and method choice, use, and side-effects are recorded in the clinic family planning registry book; other registries contain information on prenatal consultations, delivery, and PMTCT. Starting in 2012, every woman is issued an 80-page Woman's Health Booklet, which includes information on pregnancy-related care (up to 5 pregnancies), family planning, and other health information. All entries in the booklet are made by providers during women's clinic visits, but the booklets are kept by women at all times.

Conceptualization

In this study we examine determinants of post-delivery contraceptive uptake in a sample of rural women from southern Mozambique. We look at several groups of factors that might influence the timing of modern contraception initiation. First, we examine the effects of demographic characteristics such as age and parity. Higher parity should be associated with

earlier initiation of contraceptive as higher-parity women are more likely to stop childbearing or postpone future births. Net of parity, however, age should diminish the likelihood of contraceptive use because older women may generally think that they have lower pregnancy risks, compared to younger women. As in numerous other studies of determinants of contraceptive use, we hypothesize that education speeds up contraceptive uptake.

Given the scale of the HIV/AIDS epidemic in the area, we are particularly interested in the effect of HIV status. However, the literature on the association between HIV status and reproductive and contraceptive behavior is inconclusive. Reconciling the contradictory findings of that literature, Hayford et al. (2012) have argued that seropositive women are willing to either speed up pregnancy (before their health deteriorates) or forgo it altogether. Increased access to antiretroviral therapy can also affect seropositive women's reproductive expectations and aspirations.

In addition to individual sociodemographic characteristics, we test for the effect of women's marital partnership. In the absence of retrospective data on sexual behavior, marital partnership is a proxy for sexual frequency and risk of pregnancy. At the same time, marital partnership in a sub-Saharan setting can also connote less autonomy in women's reproductive decisions. At the household level, we gauge the influence of household's material conditions. Although all contraceptives in the district are available free of charge, we propose greater material resources may facilitate women's access to maternal and child health clinic that dispense contraceptives. We also seek to explore possible effects of women's connections with their informal social environment. Thus women's access to modern communication means such as mobile phones should expand their exposure to diverse types of information, including information related to sexual and reproductive health, and thus should be associated with a higher likelihood of contraceptive initiation. Also, considering the importance of organized religion in rural women's non-family experiences, we expect church attendance to

connote greater influence to non-family influences and therefore to show positive association with contraceptive use (cf., Agadjanian 2013). Next, we consider women's physical access to clinics approximated by distance between residences and clinic. Although the evidence on the association between distance to clinic and use of reproductive services is mixed (e.g., Agadjanian et al. 2013; Heard et al. 2004; Masters et al. 2013), better physical access is expected to increase the likelihood of contraceptive initiation. Finally, we test for the effect of antenatal and perinatal family planning counseling. We hypothesize that receiving family planning counseling at antenatal consultations or immediately after delivery should increase the likelihood of earlier contraceptive uptake (we do not examine the effect of post-natal counseling, typically done during child immunization visits because women whose children died shortly after birth generally were not exposed to such counseling).

Data and Method

Data for this study come from the first wave of an ongoing retrospective-prospective study of 285 women selected from the lists of those who gave live births in four rural maternity clinics (or brought their newborns there shortly after birth) in 2010-11. The women were located and surveyed in their communities of residence in 2012-13. The four clinics included in the study—Chaimite, Chipadja, Malehice, and Maqueze—are located in different parts of the district (see map in Figure 1). They differ greatly in size and array of services. Thus Malehice is the largest of the four and the closest to the town of Chibuto, the district's administrative headquarters; it has several nurses and provides various services. Maqueze is the smallest and the most remote. To allow for sound comparisons between HIV- and HIV+ women, we selected all HIV+ women who gave birth in a given clinic in the referenced period and then randomly selected the HIV- subsample from the list of seronegative parturients. The delivery record contained the name and village of residence. Interviewers

tried to locate the women based on that information and the date of delivery. The localization rate ranged from 92% in Chaimite, to 90% in Maqueze, to 72%, to 47% in Malehice (the community with the largest population size and highest residential density). The women that could not be located were substituted from randomly constructed reserve lists.

The survey instrument contained detailed questions covering women's socioeconomic background, marital and household characteristics, health of the focal child and their own, and their interactions with the health care institution. A separate module of the instrument was focused on women's knowledge and experience of family planning, including questions on family planning counselling received during and after the focal pregnancy, timing of use of specific contraceptive methods, side-effects if any, reasons for discontinuation, etc. In addition to the survey of women, attempts were made to interview marital partners of those who were in marital partnership about the partners' knowledge of and attitudes toward family planning use. However, mainly because of high levels of male labor mobility, only forty-two partner interviews were completed. The partner interview data are not used in this analysis. Data collection was carried out in collaboration between Arizona State University (USA), Eduardo Mondlane University (Mozambique), and Forum Mulher, a local NGO. The study was approved by the Ethics Board of Mozambique's Ministry of Health and by the Institutional Review Board of Arizona State University.

We begin the analysis with an exploration of patterns and correlates of contraceptive use in the survey sample. We then model survival to contraception initiation in the entire sample and in subsamples of interest. Finally, we fit proportional hazards (Cox) models predicting the hazard of contraceptive initiation from women's sociodemographic and sociocultural characteristics, partnership status, household characteristics, and their access to and experience of interaction with health clinics. In this part of the analysis, we explore for

possible interactions between HIV status and other predictors of contraceptive use. The Kaplan-Meier survival estimates are produced using the LIFETEST procedure in SAS. The Cox models are fitted using the PHREG procedure in SAS, stratifying the analysis by clinic.

Results

Descriptive results

Table 1 describes the characteristics of the survey respondents. A slightly lower number of respondents came from among the Malehice (largest clinic) and Maqueze (smallest) parturients, owing to the difficulties of locating women in the most densely populated communities (served by Malehice) and the most sparsely populated ones (Maqueze). The average interval between the birth of the focal child and the time of interview was 22 months. Respondents were about 30 years of age, on average, with a mean number of 3.6 children ever born. Forty-three percent of respondents were seropositive at the time of focal child delivery (as was noted earlier, the percent of HIV+ respondents reflected the sampling approach and therefore is not representative of HIV prevalence in reproductively active female population of the area). In 17% of cases the focal child was dead by the time of interview and 13% of women got pregnant between the birth of the focal child and the interview date. Of the 38 women who had a pregnancy between the birth of the focal child and the data of interview, 13 were using contraception, the pill or injectables, at the time they became pregnant while the other 25 did not use any contraception after the focal birth (not shown in the table). Although more than two-thirds of respondents were in a marital union (formalized or not), almost half of them had a partner staying outside of the village of residence. About 30% of respondents had never gone to school and about the same percentage had more than five years of completed schooling. Reflecting the importance of organized religion in this predominantly Christian area, two-thirds of respondents went to a church at least once in the two weeks

preceding the survey. As for the household material conditions, less than one-fifth of respondents lived in a residence with some form of electricity (e.g., grid, solar panel, battery). More than half of residences had a roof from zinc-covered sheets or similar long-lasting materials, and only a quarter of households owned cattle. Almost half of the respondents had a cell phone that only or mainly they used (i.e., a phone that was not shared by other household members).

Thirty-nine percent of respondents lived less than three kilometers from the clinic where they delivered the focal child, 45% lived between 3-7km, and the remaining 16% 8km or more from the clinic. The last section of Table 1 describes respondents' exposure to and experience of family planning. Three-quarters of them reported having received family planning counseling at prenatal consultation or after delivery and 40% said that had used oral or injectable contraceptives at least once since the focal delivery. Ever-users started using contraception on average seven months after delivery. Finally, 36% of non-pregnant reported using a contraceptive method at the time of survey.[1] In addition to the presented characteristics of the overall sample, we compared these characteristics by respondents' HIV status. HIV positive women were slightly less likely to be currently partnered than HIV negative women but on other characteristics did not differ substantially from them (not shown).

Figure 2.A depicts Kaplan-Meier estimates of contraceptive initiation for the entire sample. It shows that contraceptive use starts relatively early and most contraceptive uptake takes place within ten months of the birth. In fact, women who do not start contracepting before the end of the first year after birth are very unlikely to contracept at all.

[1] Only four respondents reported ever trying a condom since the birth of the focal child, and only two respondents were using condoms at the time of survey. It is possible that condom use was underreported in the survey, although our field observations do suggest that despite the vigorous promotion of condoms by health authorities, condom use in stable partnerships remain infrequent and sporadic. Hence, in this analysis we focus on the only two other contraceptive methods reported in the survey—the pill and injectables.

Figure 2 about here

As we mentioned in Introduction, long periods of postpartum abstinence and postpartum amenorrhea are often proposed as explanations for low contraceptive prevalence in sub-Saharan Africa. Indeed, in this sample, the median reported period of postpartum abstinence was about 6 months, and about 15% of women in the sample reported not having sex for at least one year after the pregnancy (not shown) [2]. The median duration of postpartum amenorrhea was even longer, at 9 months (not shown). Combined with the data on timing of first postpartum contraceptive use, these figures suggest that postpartum abstinence and amenorrhea do not necessarily deter use of modern methods. In fact, substantial proportions of eventual users began use before resuming sex (31%) or before resuming menstruation (47%) (not shown). Figures 2.B and 2.C illustrates this with survival curves for both postpartum amenorrhea and postpartum abstinence. The median duration of postpartum amenorrhea is slightly shorter for users of family planning than for non-users (7.5 months vs. 9 months; not shown), which implies that family planning may substitute for extended breastfeeding as a way of maintaining birth intervals for some women. However, median duration of postpartum abstinence did not vary across uses and non-users.

Figures 3, 4, and 5 examine estimated survival to first contraception across selected dimensions of interest. Figure 3 displays survival curves for women who were HIV+ at the time of focal birth and those who were not. The two curves are remarkably similar suggesting no difference in the hazard of contraceptive initiation according to HIV status. Figure 4 shows a clear difference by education: the survival curves for the three educational categories follow

[2] This figure includes all women, regardless of partnership status; continuously married women with resident husbands may resume sexual activity earlier. Women may also overreport the duration of postpartum abstinence in order to appear compliant with local norms.

an expected pattern, with greater schooling increasing the hazard of contraceptive uptake. Notably, the gap between the most educated group (women with six or more years of schooling) and the middle group is considerably larger than that between the latter and women with no schooling at all. Finally, Figure 5 compares contraceptive initiation risks between women who received family planning counseling during antenatal consultations preceding the focal birth or right after that birth and women who did not. The women in the former category tend to initiate contraception earlier and in general are more likely to use contraceptives than women in the latter category.

Figures 4 and 5 about here

Multivariate results

We now fit multivariate proportional hazard (Cox) event-history models predicting the hazard of contraceptive initiation. The models include both time-invariant and time-varying predictors and are censored at new pregnancies. The models also control for survival of the focal child. Controls for postpartum abstinence or amenorrhea are not included because of considerable overlap with contraceptive use as evidenced in Figure 2. The results of these models are displayed in Table 2. The first section includes no interaction terms. It shows no net effects of sociodemographic characteristics: the parameters estimates for age, number of children, and partnership status are not statistically significant. The effect of HIV status is small and not statistically significant either. As expected, the effect of education is positive; notably, however, only the contrast between the lowest and highest educational levels is statistically significant.

Table 2 about here

The material status of the household, as approximated by the roof material of the main residence is not significantly associated with the hazard of contraceptive initiation.[3] In comparison, women who had a mobile phone that only or mainly they used, were significantly more likely to start using contraception. As we mentioned earlier, phone ownership may not be so much an indicator of household's material conditions but rather a proxy for a woman's autonomy and her "connectedness" with the outside world. Similarly, the strong positive effect of church attendance may be interpreted in terms of the importance of women's social engagement. We remind that the effects of these three predictors should be treated with caution because they were measured at the time of the survey. Finally, the model yields instructive results for clinic-related characteristics. As expected, receiving family planning advice in the antenatal and perinatal periods is associated with earlier initiation of contraceptive use. The effect of distance to clinic of delivery is also in the predicted direction, with the difference those who lived within 3km of the clinic and those living 8km or farther being statistically significant.

Next, we explore the data for interactions between HIV status and other predictors. Interactions with sociodemographic, household, and clinic exposure characteristics yield no significant results. However, when we test for interactions between HIV status and education, intriguing patterns emerge. The results of the corresponding model are presented in the second section of Table 2. In this model, the main effect of HIV status becomes negative and highly significant. The main effects of education, in contrast, lose statistical significance. The coefficients for both interaction terms are positive and statistically significant. These results suggest that, controlling for other factors, education affects propensity toward contraceptive mainly among HIV-positive women: while at the lowest educational level seropositive

[3] We tested for other measures of household material wellbeing, but none of them had any effect. Because these measures are highly intercorrelated, we opted to keep just the roof quality in the final model.

women are less likely to start using contraception than seronegative ones, as their schooling rises, seropositive women's hazard of contraceptive initiation increases as well. Finally, the inclusion of the interaction terms hardly alters the effects of the other covariates in the model.

Conclusion

The foregoing analysis revealed an instructive picture of postpartum contraception in the rural population under study. In all, the use of contraception—either oral or injectable (with a negligible number of women reporting condom use)—is relatively high and most users initiate contraception within the first ten months of birth. Interestingly, much contraceptive use starts during postpartum abstinence and before the resumption of menstruation after childbirth. This pattern contradicts the widely held assumption that postpartum amenorrhea and abstinence are barriers to contraceptive uptake in sub-Saharan settings and requires further investigation.

The multivariate analysis produced interesting additional variations. The most straightforward and policy-relevant results pertain to the indicators representing women's experience with health facilities. They illustrate the importance of family planning antenatal/perinatal counseling for subsequent contraceptive uptake, echoing the results of a recent qualitative study in West Africa (Rossier and Hellen 2014). Yet, one should also keep in mind that family planning counseling was reconstructed retrospectively in our survey, and contraceptive users may be more likely to remember and report it. The effect of distance to clinic points to the importance of women's physical access to services. Another set of intriguing results concerns what we defined as proxies for women's social engagement with their non-family environment. The positive effects of mobile phone ownership and church-going call for further exploration of the social dimension of contraceptive decision-making. Although both phone ownership and church involvement were measured at the time of

survey, i.e., sometime after exposure to risk of contraceptive initiation began, the two indicators may reflect some enduring aspects of women's interactions within their social milieus.

Finally, perhaps the most intriguing results were generated by the multivariate models with interactions. While in the main-effects-only model HIV status per se did not reveal any association with timing of contraceptive initiation and education showed a familiar positive relationship, the inclusion of the interaction terms between two covariates suggested that the positive relationship between education and contraceptive uptake was present only among HIV-positive women. Given the relatively small sample size, we are careful not to state any firm conclusions on the basis of these results. However, these results do propose an interesting and potentially policy-relevant avenue for further examination of women's reproductive and contraceptive itineraries in rural sub-Saharan setting with high HIV prevalence.

Several limitations of the study must be acknowledged. It is based on a relatively small sample from only four rural clinics; the small sample size constrains the statistical power of the analysis. Because of the sample size and a relatively short observation span we cannot complement the current analysis of contraceptive initiation with that of discontinuation and switching. The initial design of the study included interviews with the women's partners; however, due to very high male labor mobility, only a fraction of partners could be reached for interview. Finally, although as part of the study design we attempted to collect retrospective personalized clinic-based information of service use for each study participants, the information was available only for some participants. We intend to use this pilot project's experience and results to design and implement and larger prospective study of contraceptive uptake in rural Mozambique.

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Table 1. Characteristics of women's survey respondents (percent unless otherwise noted)

Characteristic	
Clinic of delivery	
Chaimite	26.3
Chipadja	26.3
Malheice	22.8
Maqueze	24.6
Time since birth of focal child (months, mean)	22.3
Age (mean)	29.5
Number of children ever born (mean)	3.6
HIV+	42.5
Focal child died	17.2
Became pregnant after focal child's birth	13.3
Marital partnership	
No current partner	30.5
Partner currently stays in same village	22.5
Partner currently stays outside village	47.0
Education	
Never went to school	31.2
Completed between 1 and 5 years of school	39.2
Completed 6 or more years of school	29.5
Went to a church at least once in past 2 weeks	66.0
Material characteristics	
Residence has some form of electricity	18.6
Residence roof made of zinc sheets or similar	55.8
Household owns at least one head of cattle	24.6
Woman has a mobile phone that only/mainly she uses	48.8
Distance from residence to clinic of focal birth	
Less than 3km	39.0
3-7km	44.9
8km or more	16.1
Family planning counseling and use	
Received FP counseling at prenatal care/after delivery	75.1
Used an FP method* at least once since focal birth	40.3
Time to first FP use (months, mean)	7.2
Uses a modern FP method at time of survey**	36.3

Notes: *Oral or injectable contraceptives, condom-only users (n=3) excluded; ** non-pregnant respondents.

Table 2. Multivariate Cox regression models predicting hazard of initiating postpartum contraceptive use

	Model 1			Model 2		
	b	SE		b	SE	
Demographic & health characteristics						
Age	0.03	0.02		0.03	0.02	
Parity	-0.05	0.07		-0.08	0.07	
Partnered (time-varying)	-0.15	0.23		-0.15	0.23	
Education (reference: never went to school)						
Completed 1-5 years	0.18	0.28		-0.36	0.33	
Completed 6 or more years	0.62	0.30	*	0.02	0.37	
HIV positive at time of focal birth	-0.08	0.20		-1.30	0.52	**
Focal child died (time varying)	-0.69	0.35	*	-0.70	0.36	*
Household & social characteristics						
Residence roof made of zinc sheets or similar	0.18	0.22		0.19	0.23	
Has own mobile phone	0.41	0.22	+	0.42	0.22	*
Went to church in past 2 weeks	0.48	0.25	*	0.51	0.25	*
Clinic access & and experience						
Received antenatal FP counseling	0.77	0.29	**	0.74	0.29	**
Distance from residence to clinic (ref. <3km)						
3-7km	-0.10	0.20		-0.05	0.21	
8km or more	-0.68	0.34	*	-0.75	0.35	*
Education x HIV status interactions						
HIV positive x completed 1-5 years				1.48	0.61	*
HIV positive x completed 6 or more years				1.49	0.59	**
-2LL		693			693	

N=285 women. Significance level : + p<.10 ; * p<.05 ; ** p<.01. Models predict hazard of first postpartum use of hormonal contraception (pills or DepoProvera). Observations are censored when women experience a new pregnancy or at the time of the survey.

Figure 1. Map of Chibuto District

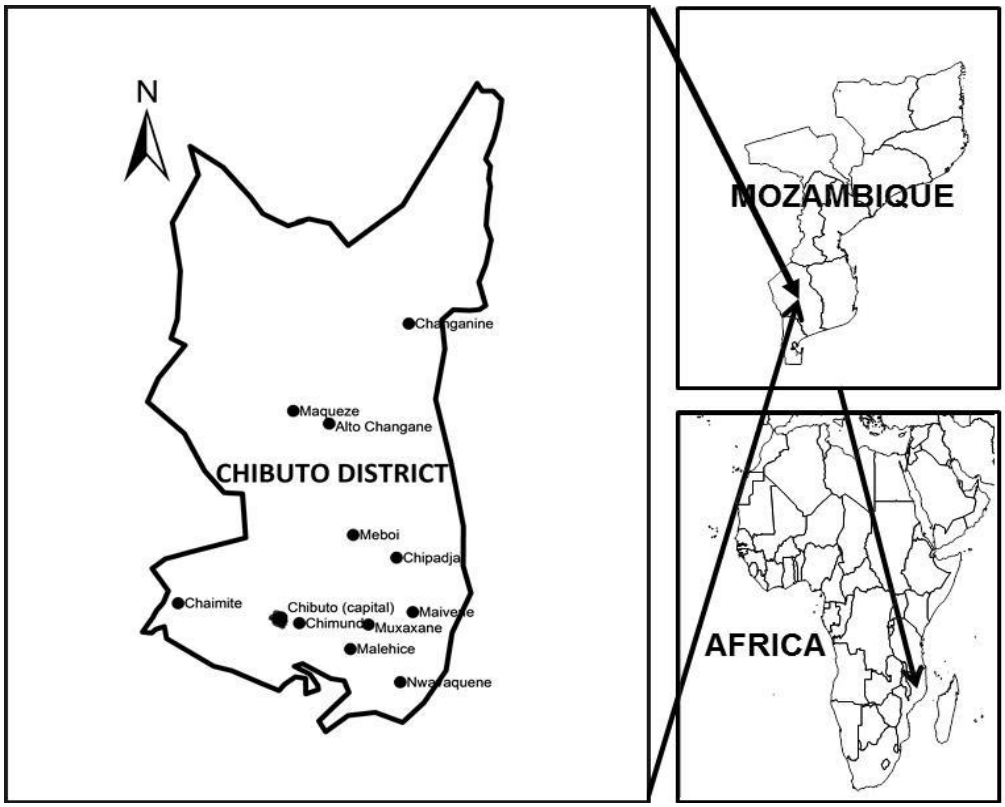
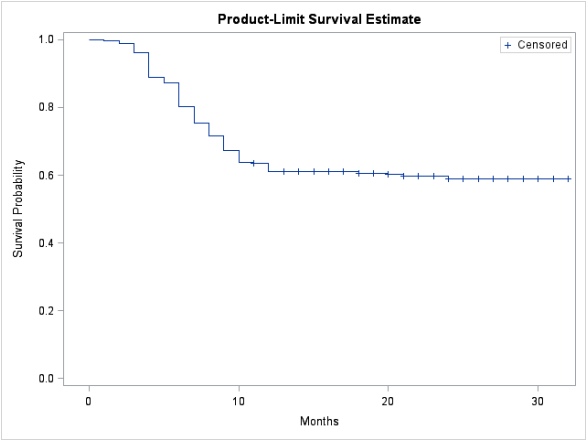
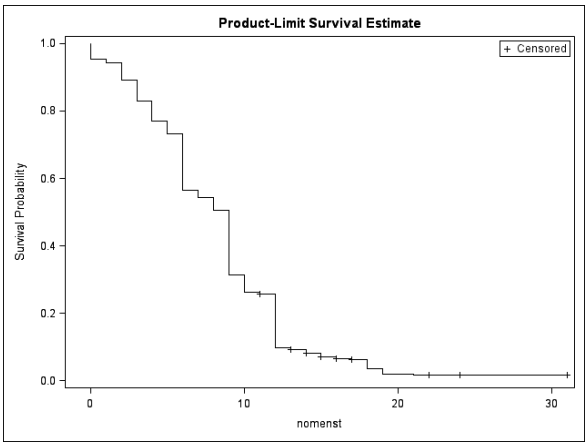


Figure 2

A. Kaplan-Meier estimates of contraceptive initiation (survival to first contraceptive use since focal birth, in months)



B. Kaplan-Meier estimates of postpartum amenorrhea (in months since focal birth)



C. Kaplan-Meier estimates of postpartum abstinence (in months since focal birth)

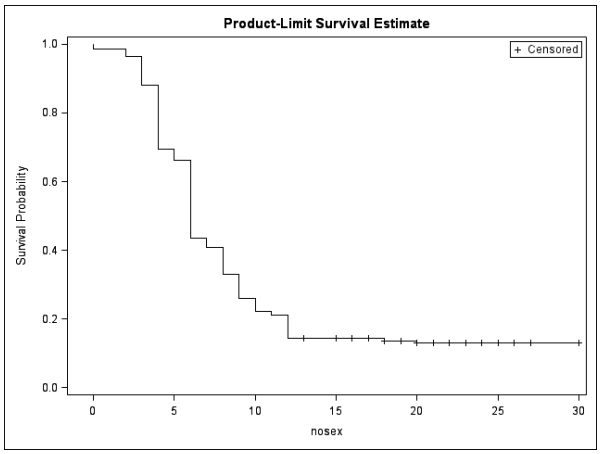


Figure 3. Kaplan-Meier estimates of contraceptive initiation (survival to first contraceptive use since focal birth, in months), by HIV status at focal birth

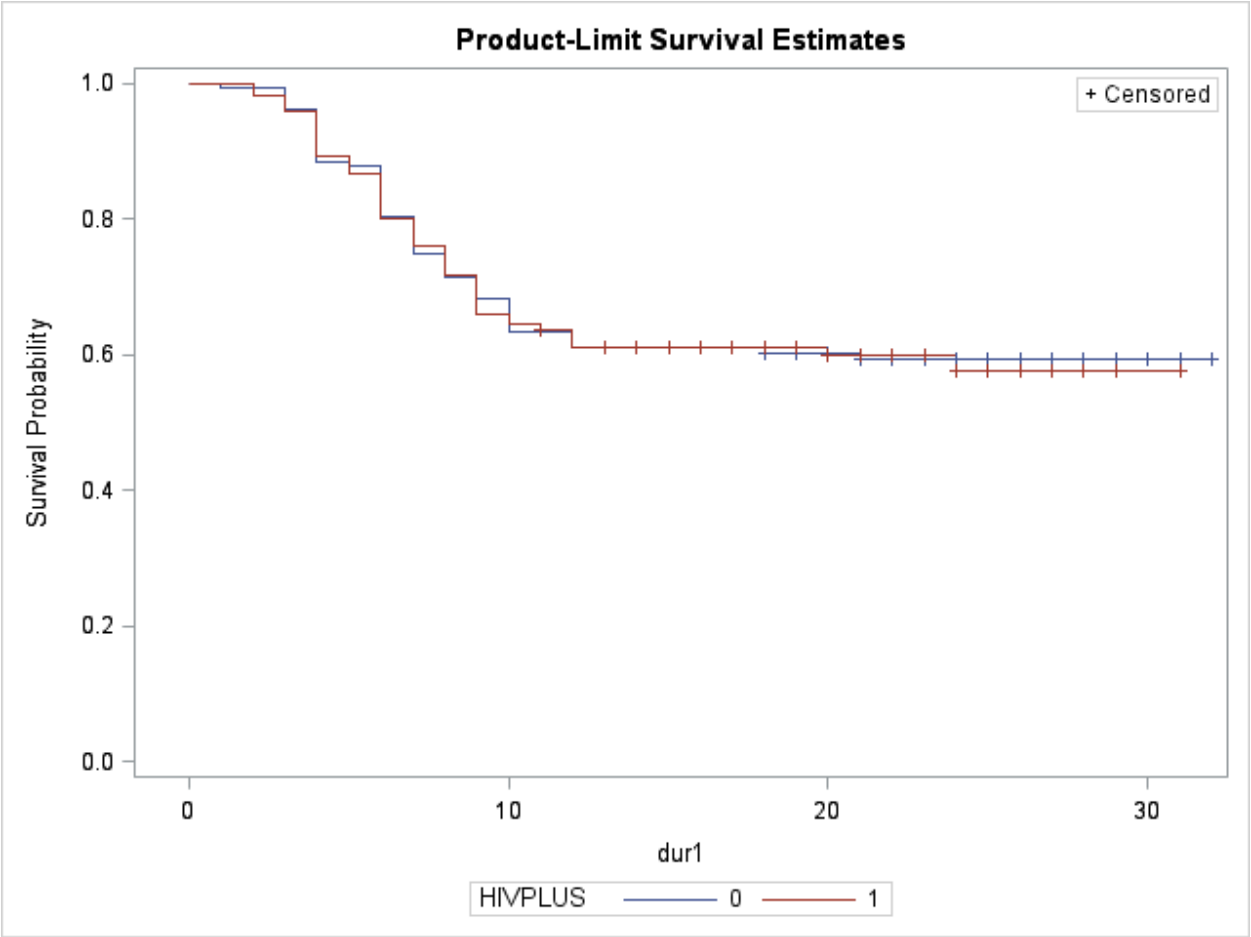


Figure 4. Kaplan-Meier estimates of contraceptive initiation (survival to first contraceptive use since focal birth, in months), by education

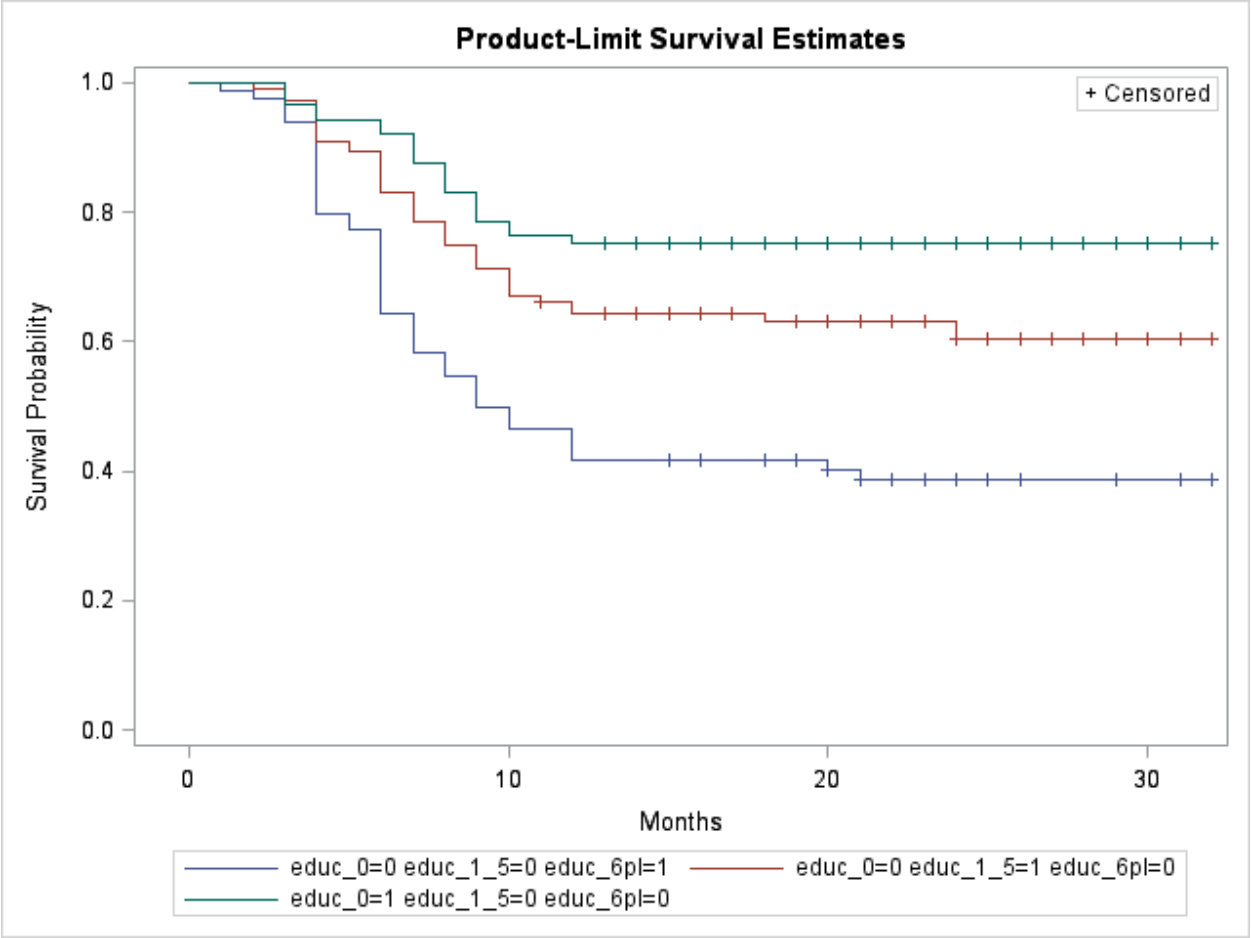


Figure 5. Kaplan-Meier estimates of contraceptive initiation (survival to first contraceptive use since focal birth, in months), by antenatal family planning counseling