Reproductive and sexual behaviour, and HIV status in pregnant women in Mwanza region, Tanzania

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Background

In Mwanza (Northern Tanzania) women of reproductive age have high HIV prevalence (7%[1]) and high unmet need for contraception (25%[2]). Providing joint family planning (FP) and HIV services would comprehensively address their sexual and reproductive health needs. Antenatal clinics (ANCs) are well attended in Tanzania (97% of women visit at least once during pregnancy, and 92% of women have at least one child in their lifetime[2]), and therefore provide an opportunity to reach a large proportion of sexually active women of reproductive age, making them an obvious choice for delivery of integrated services.

With the advent of prevention of mother-to-child transmission (PMTCT) treatment, Tanzania introduced an opt-out system whereby clinics with appropriate facilities offer HIV tests to all pregnant women on their first antenatal visit. The rationale for additionally integrating FP into ANC services is strong, as HIV-positive (HIV+) and HIV-negative (HIV-) women may have different FP needs[3], which should be addressed during FP counselling.

Moreover, as pregnant women will naturally be thinking about family building, ANC services provide a timely opportunity for FP counselling. Many women do not use FP services despite wanting to delay births, and ANCs may be the only opportunity to reach them with FP information. FP counselling during antenatal care can serve different but equally valuable purposes for various sections of the population. ANCs enable us to access married women in their prime reproductive years who may want to delay their next pregnancy; older women or women with large families who want to stop childbearing; young unmarried women who may have got pregnant by accident, and may not want another child until they are married. ANCs are also a good place to access HIV+ women, who form around 9% of our ANC population (versus 7% in the general female reproductive age population). For these women specifically, FP information can help prevent future unwanted pregnancies and thereby reduce the number of HIV-infected babies born[4-6].

Although antenatal clinics are widespread in Mwanza region, the routine services they offer are often limited, especially in rural areas, and vary considerably from one clinic to the next. Out of 42 antenatal clinics in the catchment area for this study, only 15 offered HIV testing, and even fewer of these had PMTCT delivery facilities. FP counselling is a service that can be offered at minimal extra cost in most ANCs regardless of facilities, with substantial benefits such as a decrease in unwanted pregnancies, which could ultimately help reduce the workload in overstretched ANCs.

Tanzanian guidelines for HIV counsellors in ANCs suggest mentioning FP only postpartum for HIV+ women, and not at all for HIV- women[7]. Counsellors in Mwanza reported focusing on condoms during HIV counselling, and referring women to a special clinic if they desired more information on FP.

More evidence is required on the FP needs of pregnant women to develop appropriate integrated services. If FP services are to be offered as part of HIV

counselling, the reproductive history and intentions of HIV+ and HIV- pregnant women should be investigated and their specific needs identified.

This paper reports findings from a survey of 5682 ANC attendees conducted in 17 clinics in Northern Tanzania. We start by describing the HIV context and family planning use in this population. We then identify correlates of HIV infection, and focus on the differences in reproductive behaviour between HIV+ and HIV- women. Implications for the integration of FP counselling into HIV services in ANCs are discussed.

Methods

The study was a questionnaire-based survey of 5682 pregnant women in 17 antenatal clinics in Mwanza and Magu districts, carried out between December 2007 and April 2008. This survey was the fourth of a series of routine surveys of antenatal clinic (ANC) attendees carried out by the National Institute for Medical Research (NIMR) in Mwanza for the purposes of HIV surveillance. These ANC surveys have a common core of questions covering socio-demographic background, sexual behaviour and knowledge of HIV, and each survey addresses an additional topic of special interest. The special topic of this survey was reproductive behaviour. The extra data collected included information about reproductive history, family planning and childbearing intentions.

The questionnaire was administered by trained health centre workers to pregnant women as they awaited their turn in the ANC. Each woman was identified by an anonymous study number. Two types of clinic were surveyed, covering a geographically contiguous area in Mwanza and Magu districts:

- 15 'type 1' clinics: offering syphilis testing, as well as voluntary counselling and testing for HIV (VCT) either on its own or in the context of a prevention of mother-to-child transmission (PMTCT) programme
- 2 'type 2' clinics: offering syphilis testing, but no VCT programme

At the time of interview, women in type 1 clinics had not yet had the HIV test. Although some women may have tested HIV positive in the past, these women were a minority (under 30% of women had ever tested, of which less than 10% were now positive). Therefore the vast majority of women either did not know their HIV status or thought they were uninfected at the time of interview.

The standard Tanzanian government approved procedures were followed for providing syphilis tests (type 1 and 2 clinics) and HIV tests in the context of PMTCT programmes (type 1 clinics) and the results of these tests were fed back to the women as part of routine antenatal care. Residual blood collected for syphilis tests in type 2 clinics was tested anonymously for HIV in the NIMR Mwanza laboratory following standard government approved procedures for sentinel surveillance, without informing the subjects about this additional test. The women's informed consent was obtained for participating in the questionnaire survey. Further consent was obtained for linking questionnaire data to syphilis results (and to HIV results in type 1 clinics). In type 2 clinics, no consent was sought for linking the anonymous HIV test to the questionnaire.

This survey is the baseline for a larger study seeking to evaluate the potential benefits of offering FP as part of VCT counselling at ANC. For this purpose in clinics doing HIV testing ('type 1') we offered a short FP counselling session at the end of

the post-test HIV counselling session, to women in the second half of the baseline survey, keeping women in the first half of the survey period as the control group. Then 12 months later we conducted a follow-up survey of all baseline women from type 1 clinics who had had VCT (both those who had had the FP counselling and those who had not), to enquire about their family planning use and childbearing intentions postpartum. This follow-up, along with the baseline, will enable us to both assess the need for FP counselling at ANC, by HIV status, and to evaluate the FP counselling session. This paper reports only on the baseline survey. Follow-up results will be available next year.

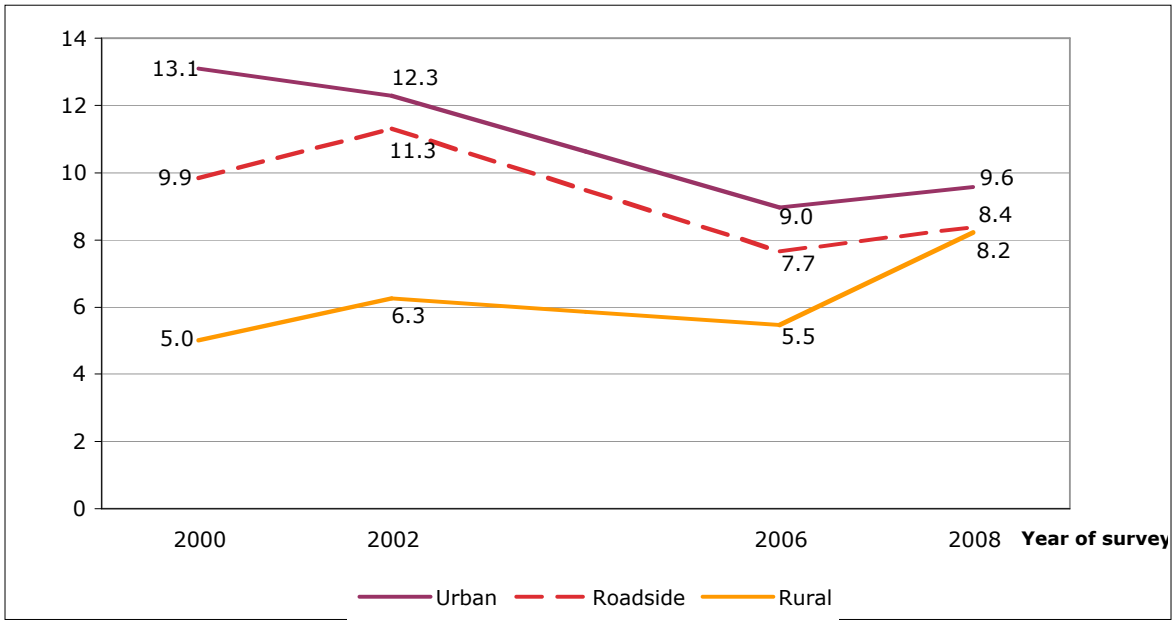
Results were adjusted for clustering at the clinic level. Since all women attending the clinics in the survey period were interviewed, the number of participants in each clinic was proportional to its size so the sample was self-weighting. Direct age standardization was used, with the age distribution of all women as standard. Comparisons between proportions were made using the Wald statistic (based on the F-test with adjusted degrees of freedom for several proportions, and on the t-distribution for two proportions). Multivariate linear regression and logistic regression models were used to adjust for confounding. All statistical tests are reported at the 95% significance level.

Ethical approval was obtained from NIMR's Medical Research Coordination Committee and the Ethics Committee at the London School of Hygiene.

Results

The HIV context

Figure 1. Trend in HIV prevalence over time by location of clinic

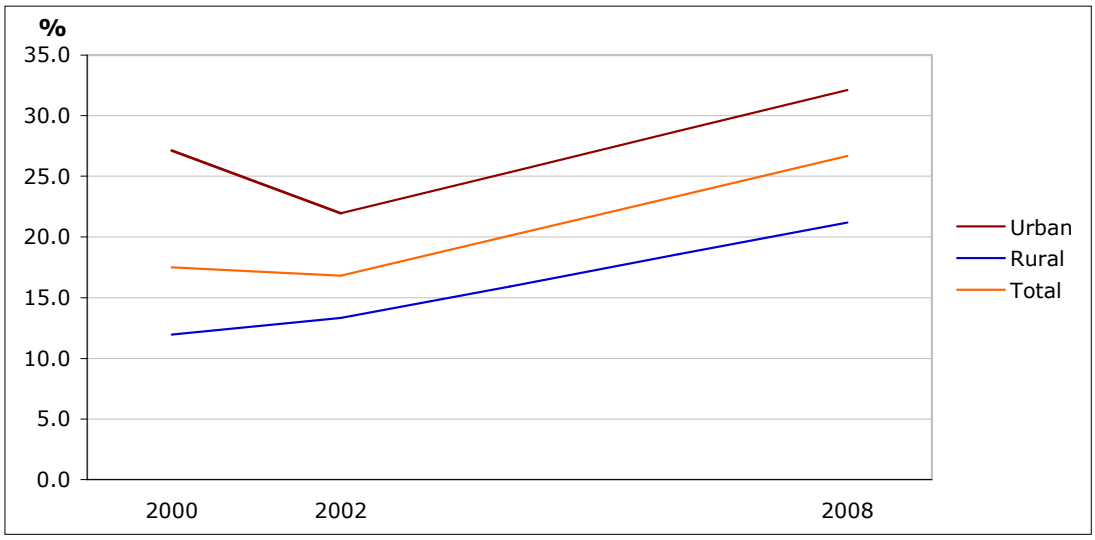


P-values for tests-for-trend between rounds: urban p<0.001, roadside p=0.020, rural p=0.019

Overall, HIV prevalence was 10.5% in 2000, 7.6% in 2006, and 9.1% in 2008, showing fluctuation with an overall decrease. In urban areas where prevalence has always been higher, it has significantly decreased over the past 8 years. Meanwhile in rural areas, which tended to have lower prevalence, prevalence has significantly increased over time. Prevalence rates in urban, roadside and rural settings have converged, suggesting a more generalised epidemic less concentrated in urbans areas.

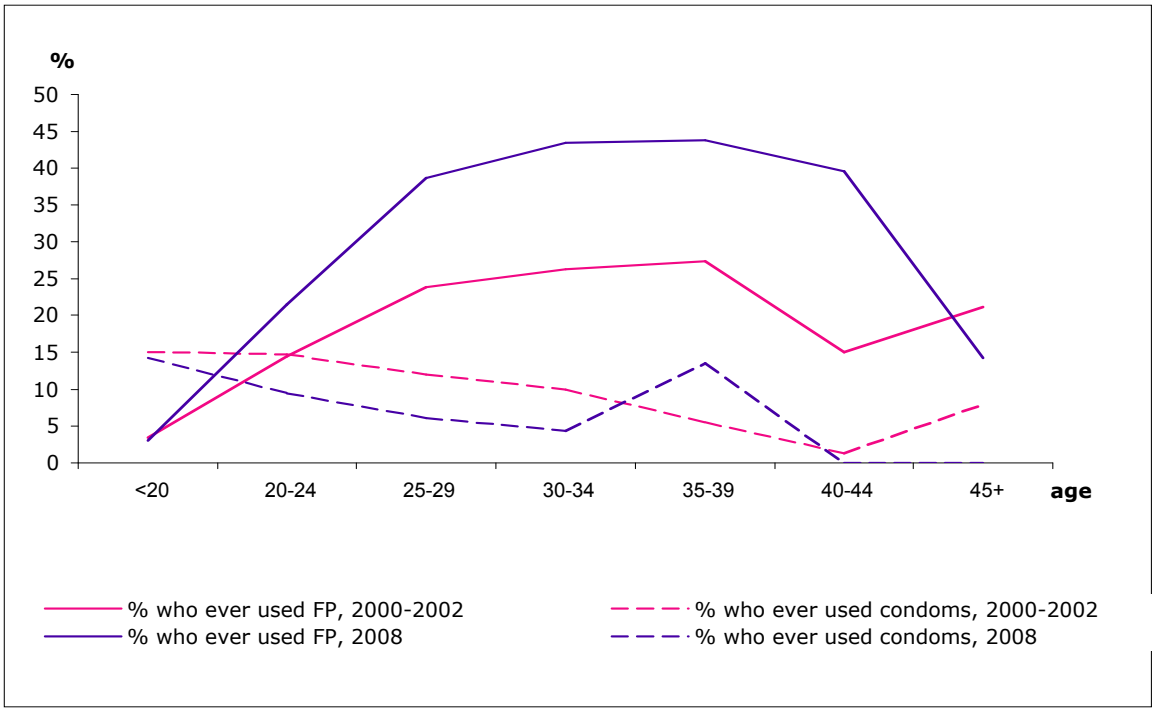
The family planning context

Figure 2. Ever use of FP in 2000, 2002 and 2008 surveys



FP ever use overall has increased steadily since 2000 from 17.5% to 26.7%, with FP use always higher in urban areas than rural areas (figure 2). FP use has increased at all ages apart from under 20s since 2000-2002 (figure 3). It increases with age, but declines from 40 onwards as women approach the end of their reproductive years, in a pattern resembling a typical fertility schedule. On the other hand, condom ever use is higher in younger women and declines with increasing age, suggesting possible increased awareness of HIV in the younger generations. Condom ever use appears to be lower in 2008 than in 2000-2002, but this may be due to the different methods of data collection: in 2000 and 2002 women were specifically asked if they had used condoms, while in 2008 women were asked if they had used FP, and if so which methods; they would only have mentioned condoms if they considered them a FP method, which is not always the case in Mwanza region where condoms are seen more as a method of STI prevention than contraception (TAZAMA internal document).

Figure 3. Ever use of condoms and other family planning methods, by age



After adjusting for education, marital status, age and residence, parity was strongly associated with FP ever use: compared to women with 1 child, women with no previous children were much less likely to have used FP (OR=0.06, 95%CI: 0.03-0.10), while women with 2-3 children were much more likely to have used FP (OR=1.61, 95% CI; 1.30-1.98). However the association disappeared beyond 3 children, which is to be expected as women who achieved large family sizes are less likely to have used FP.

The injectable was the most popular method, with 71% of FP ever users reporting having used it. Second was the pill, reported by 41% of FP users. 7% of FP users reported having used the male condom, and 2% or under reported the IUD, the implant, female condoms, foam/jelly, withdrawal, abstinence, and traditional methods.

Correlates of HIV

Odds of HIV infection increase overall with age (table 1). However, odds of HIV infection are highest for 25-40 year olds, after which they decrease slightly. 25-40 year olds are significantly more likely to be HIV+ than 20-24 year olds, while women under 20 are significantly less likely. There was no significant difference in odds of HIV infection between married, never married and ex-married women, but women who remarried had significantly higher odds of being HIV+ than women in their first marriage, suggesting remarriage may be a risk factor for HIV. The association between years sexually active before marriage and HIV infection was borderline significant, with odds of being HIV+ increasing with years of pre-marital sexual activity. HIV+ women were more likely to have their last-born child die, and a long last birth interval (over 3 years) and past use of FP were also markers of HIV infection.

Table 1. Correlates of HIV

Characteristics	HIV prevalence (95% CI)	Crude OR for HIV infection (95% CI)	Adjusted[a] OR for HIV infection (95% CI)	Adjusted[a] p-value
Total (N=5519)	9.1% (7.6-10.8)			
Socio-demographic characteristics				
Age				
14-19	5.7% (4.2-7.7)	0.71 (0.54-0.93)	0.66 (0.48-0.90)	0.012
20-24	7.9% (6.6-9.5)	1.00	1.00	
25-29	10.5% (8.3-13.3)	1.37 (1.07-1.76)	1.65 (1.20-2.28)	0.004
30-34	13.2% (9.7-17.7)	1.77 (1.32-2.37)	2.75 (1.81-4.19)	<0.001
35-39	11.3% (7.8-16.3)	1.49 (1.03-2.15)	2.46 (1.31-4.63)	0.008
40+	8.1% (3.7-16.7)	1.02 (0.45-2.33)	1.62 (0.67-3.92)	0.261
OR for HIV infection for 1 yr increase in age		1.04 (1.03-1.06)	1.08 (1.05-1.11)	<0.001
Marital status				
Never married	7.8% (5.2-11.6)	0.90 (0.61-1.33)	1.13 (0.70-1.81)	0.588
Married (first marriage)	8.6% (7.1-10.3)	1.00	1.00	
Re-married (second or more)	13.4% (10.3-17.3)	1.65 (1.24-2.18)	1.49 (1.17-1.89)	0.003
Ex-married	8.9% (5.3-14.7)	1.04 (0.61-1.78)	0.92 (0.54-1.56)	0.742
Sexual behaviour				
Years sexually active before marriage				
0	7.8% (6.2-9.8)	1.00	1.00	
1	8.4% (6.5-10.9)	1.09 (0.78-1.52)	1.11 (0.78-1.57)	0.545
2	9.6% (6.4-14.1)	1.25 (0.81-1.93)	1.25 (0.79-1.96)	0.317
3+	10.6% (7.6-14.6)	1.40 (0.95-2.07)	1.19 (0.84-1.69)	0.311
OR for HIV infection for 1 yr increase in time sexually active before marriage		1.07 (1.02-1.12)	1.04 (1.00-1.07)	0.053
Reproductive history				
Parity				
0	7.1% (5.3-9.6)	0.70 (0.56-0.89)	1.13 (0.84-1.53)	0.387
1	10.5% (8.2-13.4)	1.07 (0.79-1.46)	1.38 (0.99-1.91)	0.053
2	9.9% (7.6-12.8)	1.00	1.00	
3	9.5% (7.6-11.9)	0.97 (0.65-1.43)	0.77 (0.51-1.16)	0.191
4+	9.2% (7.0-12.1)	0.93 (0.64-1.36)	0.53 (0.33-0.83)	0.009
OR for an increase of one child		1.02 (0.96-1.08)	0.81 (0.72-0.91)	0.001
Last child alive				
No	13.9% (9.5-19.8)	1.00	1.00	
Yes	9.5% (7.8-11.4)	0.65 (0.45-0.94)	0.66 (0.45-0.97)	0.036
Last birth interval				
2 years and under	5.8% (3.6-9.2)	1.00	1.00	
2-3 years	7.1% (5.6-9.1)	1.24 (0.69-2.23)	1.20 (0.68-2.12)	0.507
Over 3 years	13.3% (11.1-15.9)	2.49 (1.50-4.13)	1.97 (1.20-3.23)	0.011
Ever used FP				
No	8.0% (6.6-9.7)	1.00	1.00	
Yes	12.2% (10.3-14.3)	1.60 (1.37-1.87)	1.38 (1.14-1.66)	0.002

[a] Adjusted for residence, age, marital status and parity.

HIV and reproductive behaviour

Table 2. Reproductive behaviour correlates of HIV infection

	HIV-positive	HIV-negative
Mean parity standardised for age	1.6 (1.4-1.8)	1.9 (1.7-2.1)
Mean birth interval in months standardised for age and parity	52 (48 - 56)	42 (39 - 44)
FP ever use (%)	35.5 (27.9-43.8)	25.3 (20.8-30.4)
FP use since last birth (of all FP ever users) (%)	78.8 (72.1-84.2)	86.4 (78.8-91.5)
Last born child died (%)	8.6 (5.9-12.4)	5.7 (5.1-6.5)
Mean percent of children alive, of total born per woman, standardised for age	89.5 (86.0-93.0)	91.2 (89.9-92.5)

Building on the correlates of HIV identified in table 1, table 2 summarises the significant differences in reproductive behaviour between HIV+ and HIV- women (after adjustment, all differences were significant at the 95% confidence level). HIV+ women were more likely to have their last child die, and had a higher percentage of their total children dying, than HIV- women. HIV+ women were more likely to have used FP than HIV- women, both in their lifetime and since their last birth (for women of parity one or more). However, looking just at past FP users, a lower proportion of HIV+ women had used FP since their last birth than HIV- women; the difference remained significant after adjusting for age, parity, residence, marital status and survival of last-born child (p=0.018).

There were no significant differences between HIV+ and HIV- women in method distribution amongst ever users of FP.

Discussion

The lower parity observed in HIV+ participants supports previous findings of lower fertility in HIV infected women[8-11], due to biological effects of infection such as lower fecundity and higher rates of foetal loss[8, 9, 12, 13], and behavioural factors such as higher prevalence of widowhood and reduced sexual activity in symptomatic HIV+ women[13, 14]. Biological explanations find some support in the longer birth intervals displayed by our HIV+ sample. Higher FP use in HIV+ women may also contribute to lower fertility, although past FP use was also associated with older age and higher parity.

The lower fertility of HIV+ women has certain implications for FP service provision to HIV+ pregnant women. If HIV+ women who had low fecundity in the past want more children, they may opt not to use FP postpartum to increase their chances of conception, leading to closely spaced births in fecund women. This idea finds support in the lower proportion of HIV+ than HIV- ever users having used FP since their last birth. Higher mortality of children of HIV+ mothers may lead HIV+ women to want to "replace" children who have died to achieve a culturally acceptable family size. Although some women may prefer to delay or stop childbearing if they know they are HIV+, as reported in other studies[15-17], FP counselling should devote particular

attention to those women who desire another child, to ensure they are aware of the risks of MTCT, and are offered the possibility of spacing their births to reduce the risks of adverse pregnancy outcomes.

The death of a baby can also lead to shorter birth intervals through biological mechanisms, as the mother stops breastfeeding and resumes menstruation sooner. HIV+ women are likely to be in this situation more often than HIV- women. Moreover, some HIV+ women will not breastfeed at all, following PMTCT guidelines. FP counselling for HIV+ women should highlight the increased risk of pregnancy in the absence of breastfeeding, even in the first few months postpartum, and recommend the use of FP if the client does not want a child in the next 2 years (which was the case for 86% of HIV+ women in our sample). This is especially important given the lower FP use by HIV+ ever users since the previous birth.

The popularity of the injectable and the pill testify to women's need for a method that is discreet and simple to use. Injectables in particular afford women the opportunity to use contraception without telling their partner, a valued advantage in a society where men want more children than women [2]. FP counselling should evaluate each woman's medical and social circumstances in order to offer methods adapted to her needs. This will help reduce the FP discontinuation rate, currently 38% within the first year in Tanzania [2]. There is an urgent need to address the widespread reluctance to use condoms. FP counselling in ANCs can work towards increasing their acceptability by challenging their widespread association with infidelity in this population, and promoting them as a means of preventing pregnancy rather than solely STIs and HIV.

The increase in use of FP with age and from parity 0 to 1 should act as a reminder that young women with no previous children are less likely to have used FP. Yet still 15% of 15-19 year-olds of parity 0 did not want a child at the time they got pregnant. FP counselling should ensure teenagers receive adequate information and access to FP.

Although never married women were not at increased risk of HIV compared to married women, the odds of HIV infection increased with each additional year of pre-marital sexual activity. This is presumably related to number of sexual partners before marriage, or to the greater instability of pre-marital relationships. Similarly, the increased risk of HIV infection associated with remarriage may be partly put down to increased number of sexual partnerships. In the context of VCT, FP counselling could identify HIV- women at potentially higher risk of HIV infection (for instance women about to remarry, unmarried women in unstable relationships) to promote condoms as a contraceptive method, and ensure they have access to them if they choose.

The lower prevalence of past FP use in rural areas compared to urban areas underscores the need to increase FP access in non-urban areas, especially as the demand for FP is as high as in urban areas. Integration of FP counselling into ANC services may therefore be of highest priority in rural areas where sources of FP information are likely to be fewer.

Conclusion

An analysis of the differing reproductive and sexual behaviour of HIV+ and HIV- women can suggest ways to improve FP services in ANCs, and to tailor FP counselling to the needs of HIV+ women pre- and post-partum. HIV counselling is now part of many ANC services in Tanzania, and is a valuable opportunity to reach women with FP information, and provide truly comprehensive reproductive and sexual health services for HIV+ and HIV- women. Only a minority of women have ever used FP. FP counselling as part of ANC services can provide tailored information to pregnant women, HIV+ and HIV-, to enable them to make an informed decision about their future reproductive career. The public health importance of preventing unwanted pregnancies and MTCT should act as a strong incentive to integrate these services.

In order to design effective FP counselling tailored to the needs of the clinic population, more research is needed to examine socio-demographic and reproductive profiles of ANC attendees in other settings. The success in integrating a FP programme into ANC is likely to be dependent on its suitability to the particular social and cultural context.

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