FERTILITY LEVELS AND PATTERNS AMONG HIV-INFECTED AND UN-INFECTED WOMEN IN KYELA DISTRICT A CASE STUDY FROM TANZANIA.

1.0. Introduction

The fertility transition, seen in many parts of the world, has been slow to start in Sub-Saharan Africa, although recent evidence suggests a moderate of fertility in few countries (UNAIDS, 2003). It is not clear how the HIV epidemic will alter future levels of fertility and what impact it will have on the nature of fertility transition. The contribution of HIV/AIDS to the fertility transition is not currently evident due to the fact that. For four reasons. First, isolating the factor of HIV/AIDS from other factors of fertility is a complex process because it is not a proximate variable, but one of the contributors to several proximate determinants of fertility. Secondly, for the impact of the epidemic to be felt, the prevalence has to be high in the region of 20 percent and be sustainable for a long time, about a decade or longer. Thirdly, behavior factors may reduce fertility of women with symptoms of AIDS, but not those asymptomatic. Fourthly, as infant mortality increases, the need to replace dead children and produce more to ensure survival of some will challenge implementation of family planning programmes in Sub-Saharan Africa and perhaps increase fertility. Also, increasing HIV prevalence in the region will mean that HIV/AIDS programmes will compete for resources with family planning progrmmes, which would weaken the latter (UNAIDS, 2003).

Recent studies in Sub Saharan Africa have shown that fertility is reduced among HIV infected women compare with uninfected women. The size and pattern of this fertility reduction has important implications for antenatal clinic-based surveillance of the epidemic and also for estimates and projections of the demographic impact of the epidemic. A demographic surveillance system study done in Kisesa Ward, Mwanza Region in Tanzania during 1994 – 98 and two large sero-surveys of all residents in 1994 – 95 and 1996 – 97 revealed a substantial reduction in fertility among HIV-infected women compared with uninfected women (Zaba, 1998). The fertility reduction was most pronounced during the terminal stages of infection, but no clear association with duration of infection was observed. The use of modern contraception was higher among HIV-infected women. However, both among contraception and non-contraception women, a substantial reduction in fertility were seen among HIV-infected women (Zaba, 1998).

The relationship between AIDS and fertility is complex, and AIDS may have both depressing and increasing effects on fertility rates (Gregson. 1994; Ntozi et al, 2001; Gregson, Zaba et al 1996b). HIV/AIDS and the adoption of HIV prevention behaviors can affect fertility patterns, and fertility can affect the risk of HIV infection. Many of the proximate determinants of fertility and HIV infection are similar, such as sexual exposure within or outside marriage, contraceptive use, breastfeeding, and pathological sterility from sexually transmitted infections (Bongaarts, 1978). In addition, changes in socio-economic, cultural and other contextual factors (i.e. political stability and population policy) are also major determinants of reproductively behavior as well as HIV infection. It is, therefore, very difficult to discern the effects of AIDS on fertility among many competing factors (Bongaarts, 1978).

In Tanzania very few studies have been done on the impact of HIV/AIDS on fertility. Despite these few studies much attention has been focused more at national level than at regional and district levels where all policies and development programs are made the only study that was done at micro level was that conducted at Kisesa Ward, Magu district in Mwanza region, Tanzania. However, the study failed to shed some light on the effect of sexual behavior factors (frequency of intercourse, number of sexual partners, and age at first intercourse) on fertility among HIV infected and uninfected women in Kisesa ward because detailed data were not collected. Nonetheless, this paper has focused mainly on the influence of HIV/AIDS on fertility patterns, levels and differentials among HIV infected and uninfected women in the Kyela District, Tanzania.

2.0. Background and Methods

This study was carried out in the Kyela District, Mbeya region, Tanzania. The district bordered to the North by Rungwe District, to the Northeast by Makete and Ludewa districts of Iringa region, to the Southeast by Lake Nyasa, to the South by Malawi and to the West by Ileje District.

The population of Kyela district was 173.830 on 2002 (Kyela District profile. 2003). Out of this 42.578 were females. The population density of the district was 131 persons per square kilometer. The average population growth rates over the 1978 – 1988 and 1988 - 2002 period were 1.6 and 1.8 percent respectively. There was a slight increase in the population growth rate of 0.3 percent over the period of 14 years (1988 to 2002). In 2008, the projected population of Kyela district was 208,845 people (100,776 male populations and 108,069 female population) (NBS, 2006).

In measuring the impact of HIV/AIDS on fertility in the Kyela district, both quantitative and qualitative research approaches have been employed due to complexity of the disease in the community which deserves serious attention during the analysis. The research focused more on quantitative information while the qualitative information, has been gathered through focuses group discussions with a group of women aged 15-49 years in the study area. A multi-stage sample was employed in this study and a total of 1,050 women out of 43,578 were randomly selected for the study. Among other things, since this study involved some medical background, the District Medical Officer was helpful in assisting nurses who were interviewers in case of hazards when they were taking drops of blood from respondents for HIV test.

The Fertility Rate Ratio (FRR) for comparing HIV positive and negative women was computed to determine the magnitude of fertility reduction due to HIV infection in Kyela District. In this study the FRR was defined as follows:

$$FRR = \frac{\text{Births to HIV positive women} \,/\, \text{All HIV positive women}}{\text{Births to HIV negative women} \,/\, \text{All HIV negative women}}$$

The relative odds of infection (FOI) with HIV in pregnant women compared with all women were used to determine the magnitude of fertility decline due to HIV. FRR gathered were directly from pregnancy rate in HIV-infected and HIV un-infected women in the study area. The ROI on the other hand was obtained from studies comparing HIV prevalence in women attending antenatal clinics and in the general population. The two measures are approximately equivalent provided that the differences in outcome of recognized pregnancy between HIV infected women and the general female population are insignificant (Zaba, 1998). As such fertility data were gathering from the two sources; the first one was from number of birth occurred in the household during the 12 months (current fertility data) and from children ever born (retrospective fertility data) for both HIV infected and uninfected women in the Kyela District. Fertility data were smoothed using Brass P/F Ratio Method due to memory lapse among women in Kyela District.

3.0. Major Findings

3.1. HIV Prevalence Using Antenatal Clinic (ANC) Data and Cross Section Data

The study provides HIV prevalence using both ANC data from Kyela District Hospital and cross sectional data generated at household level among 1,050 women interviewed. The study revealed HIV prevalence of 18.4 percent using cross sectional data compared to 20 percent obtained from ANC. It is obvious that HIV prevalence estimated using data in Kyela District overstates the magnitude of HIV infection in the study area. It has been documented that ANC data do not capture the information on HIV prevalence in no-pregnant women, nor in women who did not attend clinics for ante-natal care. Pregnant women are more at risk for HIV infection than women who avoid both HIV and pregnancy through the use of condoms or women who are less sexually active and therefore less likely to become pregnant or expose themselves to HIV. Moreover, ANC data do not include social economic characteristics that may facilitate HIV infection. Finally, ANC data are sex selective; therefore, the rates among pregnant women are not a proxy for male HIV rates (Hunters, 2004). These results suggest that estimates from ANC overstate the HIV prevalence level among women aged 15-49 years in the study area. It is imperative to state that, the level of HIV prevalence in the study area is not promising for HIV free future generation. It is most likely that these women may decide to limit the number of births due to HIV infection otherwise.

A number of studies conducted in Uganda (Kilian et al..1999), Tanzania (Kigadye et al 1993: Kwesigabo et al.. 1996) and Kenya (Kahindo et al.. 1999) have assessed the representativeness of women attending ANC's for all women in terms of HIV prevalence estimates of HIV prevalence from sentinel surveillance of pregnant women attending for antenatal care were compared with estimates from community based surveys of women in the general population. These studies revealed that the prevalence of HIV among ANC women is lower than the prevalence amongst women in the general population. However, in the Lusaka and Mposhi, Zambia studies the difference fails to reach statistical significance. In the Kenyan study the prevalence in ANC attendees is remarkably similar to that among women in the general population.

In the studies in Lusaka and Mposhi, Zambia and Yaounde, Cameroon, HIV prevalence among ANC women aged 15 to 19 years is greater than the prevalence among women aged 15 to 19 years in the general population. In the Ndola, Zambia study, the prevalence in those aged less than 18 years was higher among ANC women than in the general female population. In Uganda, ANC women aged 15

to 19 years had a slightly lower HIV prevalence rate than all women in this age group. In the Kenyan study, among young women the prevalence rate of HIV is slightly higher among all women than pregnant women. There is particular interest in the prevalence in these younger age groups since HIV prevalence in these groups is considered a reasonable proxy of HIV incidence, as a high proportion of infections in this age group will be recent infections (Zaba et al., 2000). It is logical to say that there is no clear direction in estimating HIV prevalence using ANC data and household data. It is obviously demonstrated from other studies that ANC data has understated the HIV prevalence. This study recommended that use of HIV prevalence estimated at general population is paramount.

3.2 Estimation of Current Fertility for HIV Infected

A retrospective study in Abidjan, C'ote d'Ivoire showed a significantly reduced number of pregnancies for HIV infected women compared to uninfected women aged 25 years and above (Desgrees du Lou, 1998). However, for HIV infected women aged less than 20 years the mean number of pregnancies was significantly greater. HIV infection was significantly associated with a higher number of abortions (spontaneous and induced combined) and stillbirths. As all women were unaware of their infection status the results are unlikely to have been influenced by a change in reproductive behavior and this study therefore suggests HIV has deleterious consequences on fertility.

Based on these findings from other studies, the study done in Kyela reveals a similar pattern like that of women who were affected by HIV. Table 1.1 shows that the reported TFR for HIV infected women in the Kyela District areas was 2.3 children per woman. The adjusted TFR was 4.8 children per woman. When these results are compared with HIV un-infected women in the same district, it is evident that TFR for HIV infected women is low compared to HIV un-infected women as it is shown in Table 1.0 and 2.0.

Table 1.0: Reported and Adjusted TFR among HIV Infected Women

Age	ASFR f(i)	CEB P(i)	Fertility Phi(i)	F(i)	PF ratio
15-19	0.06	0.54	0.29	0.08	6.67
20-24	0.06	1.88	0.98	0.65	2.90
25-29	0.08	2.50	1.76	1.46	1.71
30-34	0.10	3.17	2.34	2.12	1.50
35-39	0.11	4.47	2.78	2.62	1.71
40-44	0.06	4.07	2.99	2.94	1.38
45-49	0.00	3.70	2.99	2.99	1.24
TFR	2.33				
		Adjusted	**ASFR's**		
		P2/F2	**P3/F3**	**P4/F4**	**Avg(P3/F3,P4/F4)**
Age	**ASFR**	2.90	1.71	1.50	1.60
15-19	0.06	0.15	0.09	0.08	0.08
20-24	0.06	0.47	0.28	0.24	0.26
25-29	0.08	0.45	0.26	0.23	0.25
30-34	0.10	0.32	0.19	0.17	0.18
35-39	0.11	0.25	0.15	0.13	0.14
40-44	0.06	0.10	0.06	0.05	0.06
45-49	0.00	0.00	0.00	0.00	0.00
TFR	2.33	8.67	5.12	4.48	4.80

Source: 2008 Kyela, Tanzania Baseline Study

Table 2.0: Reported and Adjusted TFR for HIV Un-infected Women

	Reported	Average	Cumulative		
Age	**ASFR f(i)**	**CEB P(i)**	**Fertility Phi(i)**	**F(i)**	**PF ratio**
15-19	0.04	0.54	0.20	0.08	6.57
20-24	0.16	1.88	0.98	0.66	2.86
25-29	0.16	2.50	1.76	1.46	1.71
30-34	0.13	3.17	2.39	2.16	1.47
35-39	0.09	4.47	2.84	2.65	1.69
40-44	0.08	4.09	3.21	2.97	1.71
45-49	0.06	3.70	3.53	3.45	1.07
TFR	3.53				
		Adjusted	**ASFR's**		
		P2/F2	**P3/F3**	**P4/F4**	**Avg(P3/F3,P4/F4)**
Age	ASFR	2.90	1.71	1.50	1.60
15-19	0.05	0.15	0.09	0.08	0.08
20-24	0.16	0.47	0.28	0.24	0.26
25-29	0.16	0.45	0.26	0.23	0.25
30-34	0.12	0.32	0.19	0.17	0.18
35-39	0.09	0.25	0.15	0.13	0.14
40-44	0.06	0.10	0.06	0.05	0.06
45-49	0.07	0.00	0.00	0.00	0.00
TFR	3.53	8.67	5.12	4.48	4.80

Source: 2008 Kyela, Tanzania Baseline Study

3.3. Fertility Patterns among HIV Infected and Un-infected Women

The reproductive period of a woman is usually considered to extend over a span of 35 years, from about 15 to 50 years. Ideally natural fertility could have an upper limit of as many as 35 years of births. This means that a woman gives birth during the 35 years (15-49) of her life span at 12 months interval between two successive births (Bongaarts and Potter), 1983). In this study fertility patterns among HIV infected and un-infected women were constructed and the results are presented in Table 3.0 and Figure 1.0.

The analysis of the shape of the age specific fertility schedule is an interesting and important part of the study of fertility. This is due to the fact that the mean age at child bearing which is closely related to the mean of this schedule is important in the relation between total fertility rate and population growth. The shape of the age specific fertility curve is also the link between the total fertility rate and such variables as the age at first birth and the age at menopause. For example, a decrease in the age at

first birth will affect the early part of the age specific fertility schedule and it will affect the total fertility rate through this part of the curve (Bongaarts, 1978).

Table 3.0 and Figure 1.0 show the pattern of fertility of all women, HIV infected and un-infected women in the Kyela district. The shape of the curves looks similar to those observed in other less developed countries. That is, the ASFR increases from early ages of child bearing (15-19 years) and reaches its maximum level in the age group 20 – 24 years. It then declines steadily to the end of the child bearing ages (45 – 49 years).

The curves for all women, HIV infected and un-infected women look similar, having a sharp peak at age group 20-24. Another observation from the curves is that for those women who are not affected by HIV have higher ASFRs in older ages compared to those women who are HIV positive. It could be concluded from this that HIV negative women have tended to bear more children at an old ages than their counterparts. However, it could also be argued that the observed pattern for women who are positive in older ages is due to AIDS which probably caused these women to stop childbearing due to complications prevailing in their lives.

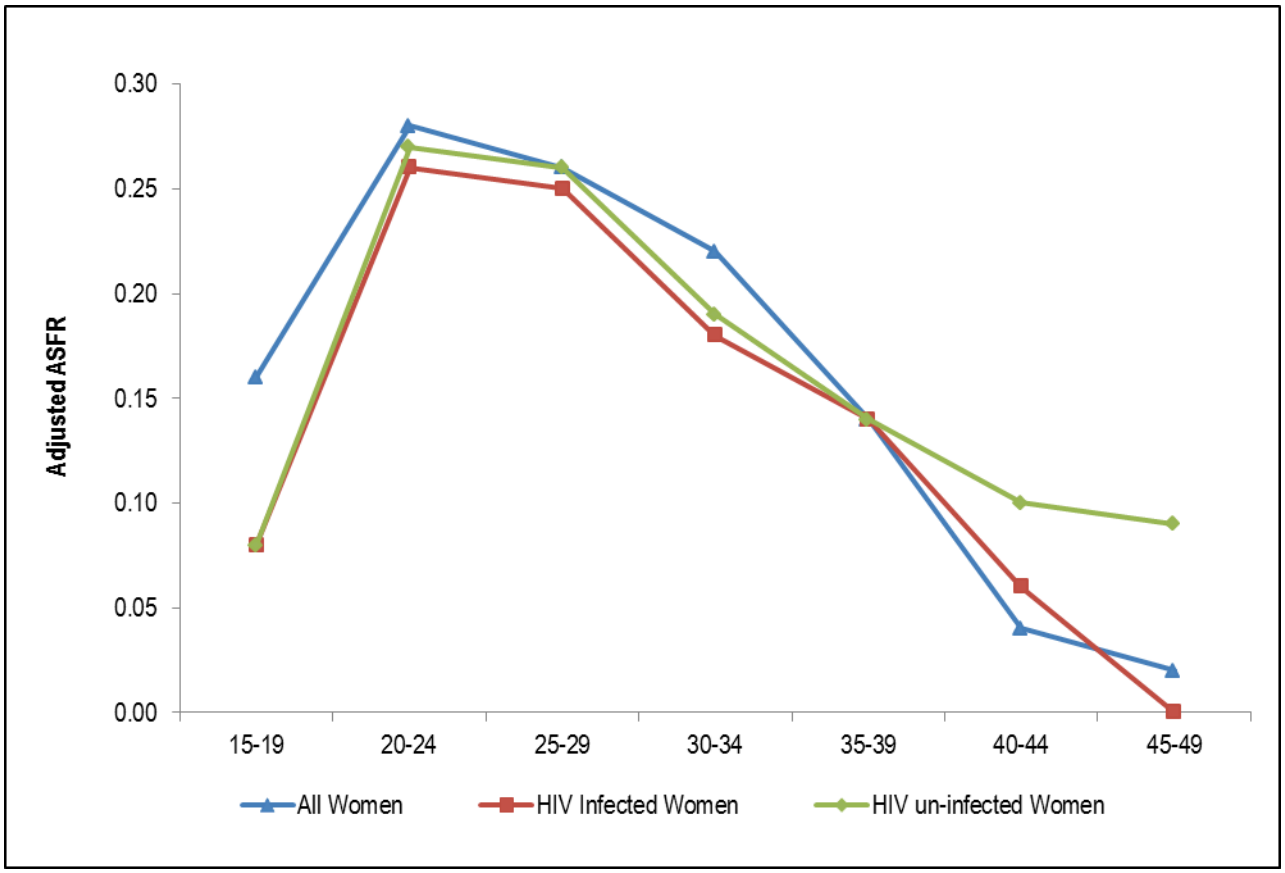
The mean age of fertility generated from fertility pattern form the study area were 27.9 and HIV infected women have low mean age at fertility compared with un-infected women in Kyela district, Tanzania.

Table 3.0: Adjusted ASFR's and TFR for all Women

Age	HIV infected and Un-infected Women		
	All Women	HIV Infected Women	HIV un-infected Women
15-19	0.16	0.08	0.08
20-24	0.28	0.26	0.27
25-29	0.26	0.25	0.26
30-34	0.22	0.18	0.19
35-39	0.14	0.14	0.14
40-44	0.04	0.06	0.10
45-49	0.02	0.00	0.09
TFR	**5.5**	**4.8**	**5.6**

Source: 2008 Kyela Baseline Study

Figure 7.1: Age Pattern of Fertility among HIV Infected and Un-infected Women



3.4. Fertility Differences between HIV-Infected Women

Zaba and Gregson have proved mathematically that the fertility rate ratio for comparing HIV positive and negative women is approximately equal to the odds of infection with HIV in pregnant women compared with all women (Zaba and Gregson, 1998). If it is assumed that HIV testing of ANC women is carried out one per pregnancy e.g. at first antenatal consultation, a difference between the fertility rate ratio and the odds of infection would only arise if there were significant differences in the outcomes of pregnancies between HIV positive and negative women after this time. In this study the fertility rate ration (FRR) and Odds of Infection (OoI) were constructed to determine the magnitude of HIV/AIDS in terms of percentage contributed to reduce fertility in the Kyela district.

The FRR for comparing HIV positive and negative women as defined in Section 2.1 and results are presented in Table 4. The total fertility rate ratio (FRR) of 0.037 was observed and this indicated that the fertility of HIV positive women compared with HIV negative women was reduced by 3.7 percent in the Kyela district. This effect is lower than what Boerm (2002) observed in a rural area in Northwest Tanzania, that the fertility of HIV positive women compared with HIV negative women was reduce by 29 percent. The reduction of 3.7 percent observed in the Kyela district coincide with a study done by Baschier (2000) which tried to assess the effect of HIV/AIDS on fertility in Tanzania and concluded that the impact of HIV/AIDS on fertility in the higher HIV prevalence zones was between three and five percent (that is, fertility is three to five percent lower than it would be in the absence of HIV/AIDS. Jane (2009) study on the effect of HIV/AIDS and fertility of sub-Saharan Africa using cross-sectional data generated from Demographic and Health Surveys observed in Zambia with HIV prevalence rate of 15.6 percent, fertility has been reduced by five percent. The other countries like Senegal with HIV prevalence of 0.7 percent the effect of HIV was small and insignificant effects of the epidemic on fertility. It is obvious that, the Kyela study shows similar patterns as those studies that have been done in Sub-Saharan Africa.

Table 4: Fertility Rate Ratio and Relative Odds of Infection

Age Group	HIV prevalence		Odds of Infection		ROI from Odds of Infection (OoI)	FRR (From ASFR)
	Pregnant women	All women	Pregnant women	All women		
15-19	0.111	0.079	0.125	0.086	0.046	0.081
20-24	0.074	0.179	0.080	0.217	0.037	0.037
25-29	0.138	0.232	0.160	0.302	0.053	0.053
30-34	0.200	0.227	0.250	0.293	0.085	0.611
35-39	0.300	0.255	0.429	0.342	0.025	0.012
40-44	0.250	0.186	0.333	0.229	0.046	0.031
45-49	0.000	0.153	0.000	0.180	0.000	0.000
All Ages	**0.077**	**0.184**	**0.083**	**0.225**	**0.037**	**0.037**

Source: 2008 Kyela Baseline Study

4.0. Conclusion

This study has attempted to examine the influence of HIV/AIDS on fertility patterns and levels among HIV infected and un-infected women in the Kyela District. It may be concluded that the levels of fertility for HIV positive women were lower than those women who were HIV negative. Broad and early peak of fertility were observed for women who were HIV negative and positive respectively. Concerning mean age at fertility schedule, it may be concluded that HIV positive women had early age at first birth compared to HIV negative women. It was found that, in Kyela district with HIV prevalence of 18.4 percent the HIV/AIDS reduced fertility by 3.9 percent.

It has also been found that ANC data overstated the HIV prevalence in the Kyela district. In this regard ANC data should therefore be used together with household data which consider both women and men in the community. The study suggests that cross-sectional data at the community level provides reliable HIV prevalence at community level rather than ANC data.

5.0. Policy Recommendations

The Government of the United Republic of Tanzania needs to review all HIV/AIDS intervention plans and programmes for reproductive sector based on the finding observed in this study. There is an urgent need of involving reproductive women and men at all levels in policy development and programme plan and the implementation to ensure that their needs are understood and reflected in all policies and programmes.

6.0. References

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