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Assessing the Impact of HIV/AIDS on the Remarriage Rate of Widows and Divorced in South Africa Using Agincourt Community as a Case Study.

By

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Abstract

This paper reviews the remarriage pattern of widows and divorcees (both male and female) within the context of HIV/AIDS in South Africa. Using retrospectively reported data based on a sample of 7535 respondents whom their previous marriage had already ended in Agincourt community. Analysis was done at the three levels, descriptive, bivariate and multivariate levels. The bivariate level employed the Kaplan-Meier curve as well as Cox regression. The multivariate level employed the Cox regression analysis.

The results show a slightly higher proportion for divorcees than widows (52% and 48% respectively) and that widows are less likely to remarry than divorcees. In addition, higher proportion of widows than widowers was observed, suggesting higher male mortality in this community. The analysis also reveals that widows are less likely to remarry than widowers. Furthermore, analysis of remarriage by end type of previous marriage and sex was done and the result discussed. Finally, an analysis of male and female widows whose spouses died of AIDS as opposed to those whose spouses died of non-AIDS related causes was done and result the result suggest that there is no relationship between partner dying of AIDS and remarriage.

In conclusion, existing prevention campaigns usually targeted individuals with multiple sexual partners, identifying them as the link between high-risk behavior and high-risk groups, but neglected the importance of individuals whose partner died or were divorced because of AIDS who later remarry. Although, the small sample size for those whose cause of death were reported constrained the main analysis for this study.

However, a need for further investigation into the impact of remarriage of widows and divorced when there is sufficient data on cause of death.

Declaration

I Emeka Francis Okonji hereby declare that this research report is my own original work. It is being submitted to the faculty of humanities and social sciences, University of the Witwatersrand, Johannesburg. It is submitted in partial fulfillment of the requirement for the degree of Master of Arts in the field of Demography and population studies.

I declare that to the best of my knowledge it has not been submitted before in part or in full for any degree or examination at this or any other university.

February 2008

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Chapter 1: Introduction

Sub Saharan Africa especially the Southern Africa has been noted by different studies for its high HIV prevalence rate. According to UNAIDS (2007), South Africa makes up about 20 percent of the world AIDS population making it the highest country in the world with HIV prevalence. ASSA2003 provincial model calculates that 345,640 people died because of AIDS in 2006 - comprising 47% of all deaths. Among adults aged 15-49 years, it estimates that 71% of all deaths were due to AIDS (Dorrington et al, 2006). According to the head of the MRC, AIDS killed around 336,000 South Africans between mid-2005 and mid-2006 (South African panel, 2006).

Consequently, deaths from AIDS have worsened the already high rate of adult mortality in this region. In addition, with the high prevalence rate of HIV, life expectancy has reduced from about 60 years to 45 years for women and 42 years for men. Therefore, if such high rates of adult mortality were observed in a context where near universal male marriages occur among adults, one consequence would be an increase in the proportion of widowhood among young women (Adetunji, 2001).

Few studies have found marital infections as the leading source of new HIV infections in many countries in sub-Saharan Africa that are afflicted by the HIV/AIDS epidemic. For example, Mishra (2007) found that in 4 of the 11 countries studied, women (in a serodiscordant union) were the infected partner in a majority of cases. The study showed, however, a significant proportion of women's infections occurred ten or more years into the marriage. According to Mishra (2007), Cote d'Ivoire and Kenya lead the

percentage of female discordant infections, at 62%. But even in Lesotho, where the female-positive rate was lowest, female discordant HIV infections stood at 34% (Mishra, 2007). This may suggest the effect of AIDS related stigma which discourages individuals who are aware of their HIV- status from sharing information about their status with their sexual partners and families, consequently making it difficult to prevent the spread of the infection or to plan a secure future for surviving child and family members (Ehiri et al, 2005).

Many studies have focused on preventing the spread of HIV through the ABC prevention methods, which stand for abstinence; be faithful; and condomize. Others had entirely focused on males as a source of HIV infection within marital unions, neglecting the possibilities of women (especially women whom their husband died of AIDS) bringing in the virus. Although, the point is not putting blame on either partner the severity warrants urgent intervention for both parties involved in a union.

Reniers (2008) using the Malawi sero-prevalence data argued that having an adulterous spouse and widowhood are risk factors for infection, and if men and women use this information in marital decision making processes they are likely to prevent HIV infection.

This study examines the remarriage patterns of widows and the divorced as well as gender differentials in remarriage among widows and divorced in the era of AIDS in South Africa. In addition other factors such as end type of previous marriage, sex, educational attainment, type of previous marriage (formal or informal marriages), marriage order, age of respondents at the end of previous marriage, calendar year (year

of exit from previous marriage) and cause of death (AIDS-related and non-AIDS related) using retrospectively reported marriage history of the Agincourt community (DSS) data as a case study.

This paper consists of five chapters, which describes the research report procedure. Chapter 1 introduces the research study, which includes background knowledge on the prevalence of HIV/AIDS and marital infections within unions, and also a brief description of the importance of this study.

Chapter two reviews the literature related with the study. It also includes the research question and the hypotheses that answer the research questions. Chapter three discusses the methodology and the technique used for the data analysis and the suitability of the data for this study. The data was collected from the Agincourt Demographic and Health Surveillance System (ADHSS). Chapter 4 presents the analysis and interpretation of tables and graphs. The analysis was done in three stages: the first stage involves a descriptive analysis that describe the data set (describing the variable by frequencies and percentages) and a multiple decrement life table plot (describing remarriage rate); the second stage involves Kaplan Meyer curves (bivariate) and a Cox regression analysis, whereby a log rank test and hazard ratios were reported respectively. The third stage involves a Cox regression, hazard ratio and p-value was reported. Chapter 5 discusses the findings of the study and limitations of the data used. It also discusses areas needed for further research and recommendations**.**

Rationale for the study: Programmes on HIV campaigns has consistently focused on abstinence, condom use and be faithful. In addition, most HIV prevention efforts have been aimed at individuals with multiple sexual partners, and few studies have seen marital unions as a means for the spread of HIV were condom is far from being accepted as a suitable preventive tool; especially the remarrying of widows and widowers whose spouses died of AIDS whom might become sources for further infection with the virus if their diseased spouses had infected them.

Aim: This study sought to answer the following questions: does being a widow or divorcee have an influence on remarriage rate in South Africa? Secondly, does partner's death from AIDS have any effect on the remarriage of the surviving spouse? Does age influence remarriage rate in South Africa? Thirdly, it investigates the change over time in the remarriage rates of widows and the divorced using retrospectively reported marriage histories and; finally gender variation in widow and widower remarriage over time.

Chapter 2: Literature Review

HIV/AIDS:

HIV/AIDS in the world has its greatest impact in Africa, especially in the Sub-Saharan Africa, where the epidemic is the leading cause of adult mortality in many of the AIDS affected countries (Porter et al, 2004). According to the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO), 38.6 million people world wide were living with HIV by the end of 2005, and 2.8 million deaths from HIV/AIDS were recorded in the same year (UNAIDS, 2007). Countries in the southern region are the worst hit by the HIV epidemic and have been shown that AIDS is the leading cause of death in most sub-Saharan Africa. For example, Statistics South Africa (2006) reported deaths due AIDS as highest among 35-39 years age group for both males and females (StatsSA, 2006). Although, new estimates has shown that about 5,500,000 people are living with HIV in South Africa. Adults ages 15 and above represent about 18.8 percent [16.8 -20.7percent] of total number of people living with the virus. Deaths due to AIDS in South Africa was recorded to be 320 000 [270 000 – 380 000] in 2006, in which women aged 15 and above living with HIV was 3,100,000 [2,800,000- 3,400,000] (UNAIDS, 2007). By 2000 the probability of dying between ages 15 and 60 was 58% for women and 75% for men (Hosegood et al, 2004). Hosegood et al (2004) enumerated the population and all adult deaths (n = 1021) in 2000, and conducted verbal autopsy interviews with the caregivers of those who died to identify the causes of adult deaths. A validation study of the verbal autopsy diagnoses was conducted on 109 individuals with hospital notes that could be located. Death rates and other mortality indices were both calculated directly and estimated indirectly by the

orphanhood method. Their result showed that, AIDS with or without tuberculosis, is the leading cause of death in adulthood (48%). And mortality had risen sharply with age among young adults with a five-fold increase in women and four-fold increase in men between age groups 15–19 and 20–24 years. Men have significantly higher mortality than women overall (Hosegood et al, 2004).

The high proportion of infected women may suggest that majority were likely to be widowed (death of their spouse due to AIDS), or divorced which may be as a result of abuse (rape) indicating the gender violence against women. Therefore, deaths from AIDS will continue where power in-equitability (gender inequality) exist and poverty and poor health systems are limited for prevention and care which fuel the spread of the virus.

Another factor that can influence the spread of HIV according to Olley et al (2004) is failure of people living with HIV to disclose their HIV serostatus, which can place their sexual partners at risk. For example, Olley et al (2004) examined HIV serostatus disclosure and its relationship to risky sexual behaviors in 69 sexually active heterosexual married and cohabiting patients diagnosed as HIV positive, and found that 78% had not disclosed their HIV serostatus to their sexual partners and 46% had no knowledge of their sexual partner's serostatus. It was argued that the reason why such disclosure will not occur may include stigmatization, fear of isolation or abandonment, lack of social support, separation or divorce, and even prosecution (Olley et al, 2004). Other studies revealed that HIV transmission within sero-discordant unions, women are solely responsible for bringing in the ailment. For example, Mishra (2007) assessed 11

sub Saharan African countries, and found out that in 9 of these countries women were the source of HIV into the union. This may be due to the fact that women's ability to negotiate condom use is compromised by age and economic disparities as noted by Longfield et al (2004), which is also a strong factor in fueling the spread of HIV within unions. As a result, uncertainties surrounding individual HIV status have also been shown to affect marriage and divorce prospects (Reniers, 2008).

***Divorce*:**

Though various studies have revealed that high sex ratio, which indicates low number of women compared to men is associated with lower divorce rate (Trent et al, 2004). For example smith et al (1984) reported low levels of divorce in Sudan, Kenya, Lesotho, and Senegal as 6%, 5%, 5%, and 3% respectively. Udjo (1996) also found similar low level of divorce in South Africa (about 4% ever married males and 6% ever married females).

Studies focusing on divorce have been greatly explored especially in the United States and some industrialized countries especially the united state which was reported to have high divorce rates as opposed to sub Saharan Africa, and have come to the conclusion that high sex ratio indicating a relatively undersupply of women are associated with low divorce rates, for example Trent et al (2004).

Researchers have come to a concession that being married or characteristics associated with being married contribute immensely to the well being of married

individuals than been divorced or separated. This is due to the fact that divorced and separated individuals especially women as noted by Waldron et al (1997) appear to have more financial problems, psychological distresses caused by marital disruption and damaging health behaviors. In addition, considering the emotional trauma surrounding the divorce, and the adjustment to life afterwards, family members immediate needs for emotional support and closeness increases (Bankoff, 1983). On the other hand, Olley et al (2004) found increased risky sexual behavior in HIV positive patients who were married or divorced.

Though, the increase in adult morbidity and mortality due to AIDS has resulted in an enormous strain on African families and households, in part through the associated problems of widowhood (Porter et al, 2004) and divorce on the other hand (Reniers, 2008). Furthermore, Udjo (1996) argues that high level of divorce has been linked to the spread of venereal diseases and infertility among the Barma people of Chad republic, and the Kanuri of north-east Nigeria. As such, marriages in Africa may be characterized as having high separation, divorce, and remarriage rates (Porter et al, 2004).

***Widowhood*:**

The level of widowhood has increased in countries of Sub-Saharan Africa that are afflicted by the HIV/AIDS epidemic (Ntozi et al, 1999). Setel (2000) found HIV/AIDS to be the leading cause of death among men and women between 1992 and 1998, On the other hand, in Ugandan for example, 4.7% of males and 10.6% of females were

widowed compared to the percentages from the 1991 census were 2.0% of males and 10.3% of females ages 15 and above who were widowed (Ntozi, 1997). Ntozi (1997) found high proportion of deaths among spouses due to AIDS ranging from as low as 42.2% to as high as 60% in kabala and Mbarara respectively.

According to Adetunji (2001), the proportion widowed is higher in countries with high HIV prevalence than those with low HIV prevalence. He found the proportion widowed ranging from 9% in Malawi to 16% in Uganda. The probability of widowhood has been found to increase with age, studies shows that the proportion widowed almost doubled between ages 35-39 and 45-49 years (Adetunji, 2001).

There have been variations in male widows and female widows respectively, in which the proportion of female widows is higher than male widows. For example Adetunji (2001), found the proportion of widowers were below the proportion of widows. In Mali 0.4% of male widows compared to 1.2% of female widows, in Zimbabwe the proportion of male widows was 0.7% compared to 3.5% of female widows, while in Zambia 1.3% of male widows compared to 4.3% female widows. Ntozi et al (1999) also found a high proportion of widows compared to widowers in Uganda (12.7% and 6.0% respectively).

Some of the major characteristics associated with widows are grief, bereavement; rituals, forced remarriages, harassment, rejection, loneliness, poverty and relatively high mortality in Africa. For example, Ntozi (1997) noted that widows in Uganda, Zambia, and Rwanda among others as part of funeral rites were required to have sexual intercourse with one of the male in-laws, mostly the brothers or cousins of the husband as a ritual to get rid of the husband's ghost. Bantebya et al (1994) noted that despite the

knowledge that a man died of AIDS, his widows are being inherited and sexual intercourse taking place between widows and the inheritors. Mukiza-Gapere et al (1995) noted that widows of dead men have been frequently harassed and dispossessed. Obbo (1993) noted those non-AIDS widows who refuse to be inherited by men they suspect to be HIV-infected are left to fend for themselves or expelled from the community.

On the other hand in the era AIDS, the custom of widow inheritance is declining because of the risk to the inheritor of HIV infection. No relative has the obligation of looking after the orphans and the widows, and households are headed by widows themselves (Ntozi et al, 1999).Therefore, the alternative solution to widowhood is remarrying.

However, numerous studies have come to the conclusion that the death of a spouse leads to a serious decline in economic well-being for surviving household member Smith et al (1988). Since so much resources is spent on caring for the deceased spouse while he or she was still alive. For example, Booysen et al (2004) assessed the household impact of HIV/AIDS by means of a cohort study of households affected by the disease. The survey was conducted in two local communities in the Free State province, one urban (Welkom) and one rural (QwaQwa), in which the HIV/AIDS epidemic is prevalent. Comparisons were drawn between so-called affected and non-affected households. The study found households with an affected member had a greater burden of morbidity and mortality when compared to non-affected affected household.

However, remarriage has been seen to alleviate the economic status of the widowed or divorced individuals, and where there are no immediate relations the surviving spouse may rely on remarriage for economic incentives (Brien et al, 2004).

***Marriage and Remarriage*:**

In the Africa culture, marriage is an institution which is established by the payment of dowry by the husband to be, to the bride's family (father in-law). In South Africa, this practice is called lobola. Traditionally lobola is payment made in the form of cattle or monetary equivalent to compensate for the loss of services of the young woman (Zwang, 2004). The amount of cattle's paid depends on the educational level of the young woman, if she had had a child for the husband to be or from another man. This form of marriage is known as the formal marriage. However, in South Africa this practice is in sharp decline and has been linked to modernization of society, women settle at the grooms residence even before lobola is paid and separation is frequent (Zwang, 2004). Informal marriages on the other hand, involve the cohabitation of a male and female without undergoing the traditional right of paying dowry (lobola).

Remarriage on the other hand is one of the most important determinants of physical and economic well-being among the widowed (Smith et al, 1991; Roan et al, 1996). However, past researchers have proposed that the motives underlying the process of marriage (and remarriage) may be viewed according to a theory of search behavior. For example smith el al (1991) argues that proponents of the search theory suggest that widowed individuals who remarry perceive the benefits of remarriage to be greater than

the net benefits of remaining widowed. While from the view point of epidemiology of HIV infection as noted by Adetunji (2001), remarriage of HIV widows and widowers is more efficient at a social level than to remain single. Since the widows and widowers who remarry are likely to localize the infection to only one household, whereas those who remain single and are sexually active could widely disseminate the infection to multiple households (Adetunji, 2001). However, remarrying widows are likely to become sources of further infection if their deceased spouse had infected them (Adetunji, 2001).

Descriptive studies of remarriage amongst the widowed have shown consistent variations across age and sex categories, at each age widowers have higher probability of remarriage compared to widows, who were found to have a lower probability of ever remarrying at all ages (Porter et al 2004). For example, Adetunji (2001) argued that the younger the age of an individual at the time of widowhood or divorce the higher their chances of remarriage. Although, males have a higher remarriage pattern than females, Ntozi (1997) found the proportion of widows in Uganda to be 65.1% as opposed to 27.3% of widowers this may be due to existence of high rate of male mortality in sub-Saharan Africa (Adetunji, 2001). In addition, poligyny and patriarchy predominant in developing countries (Olley et al, 2004) widowers in poligyny unions are less likely to be affected or termed widowers if they loose one of their wives.

While, certain societies have forbidden or seriously restricted the formal remarriage of widows to a man other than the relative of the deceased spouse for example Luo widows of Kenya (Luke, 2000) rather widows are inherited by brothers to the deceased

husband. On the other hand, others have attempted to remove virtually all formal barriers to the remarriage of the widowed (Chamie, 1981). However, studies have shown that living alone in later life after widowhood or divorce increases the risks of loneliness and early death (Gierveld, 2004).

According to Smith et al (1991), remarriage is one action that often reduces the surviving spouse's chances of encountering declines in well-being and the incidence of remarriage as a proportion of all marriages varies considerably throughout the world. Infact, many researchers view remarriage as a mechanism through which two-parent households, which tend to be more economically secure, may be reestablished (Smock, 1990).

Remarriage following divorce is common, and nearly one-half of current marriages involve a second (or higher order) marriage for one or both parents (Reniers, 2008). The highest proportions are in the United States where in nearly 4 out of 10 marriages (38.5%), the bride, the groom, or both are remarrying (Chamie, 1981). On the other hand, in sub-Saharan Africa, remarriages of widows are frowned upon and widow inheritance is practiced in some of these regions. Although, substantial proportions of people enter into new partner relationships after bereavement or divorce (Gierveld, 2004).

Research Questions

- Does being a widow or divorcee have an influence on remarriage rate in Agincourt community?
- Does partner's death from AIDS have any effect on the remarriage of the surviving spouse?
- Does age at widowhood or divorce influence remarriage rate in South Africa?
- What are the sex differences in remarriage?

Research Hypothesis:

- H_0= There is no significant relationship between remarriage rate and cause of death.
- H_A= There is significant relationship between remarriage rate and cause of death.

- H_0= There is no significant relationship between remarriage rate of the widowed and divorced.
- H_A= There is significant relationship between remarriage rate of widowed and divorced

- H_0= There is no significant relationship between remarriage rate and Age of respondents at the end of the previous marriage.
- H_A= There is significant relationship between remarriage rate and Age of respondents at the end of the previous marriage.

- H_0= There is no significant relationship between remarriage rate of males and females.
- H_A= There is no significant relationship between remarriage rate of males and females.

Chapter 3: Research Methodology

Study population and settings:

Agincourt is a rural community in the Northern Province of South Africa. It has a total population of over 70,000 people living in 10,500 households, with a population density of 172 persons per square kilometer. The male: female sex ratio for the total population is 0.929 indicating higher females as opposed to males. Agincourt is rural in terms of distance from urban centers and lack of infrastructure. The main ethnic group is South Africa Shangaan.

Women make up an increasing proportion of the migrant labor population. Informal sector activities are widespread, and include food and fruit vending. Pensions are an important source of income for many families. Female headed households constitute 32% of all households (Collinson et al, 2006).

Unemployment is estimated at 40 – 50%. Formal sector employment involves migrant men who work on the mines and in the manufacturing and service industries of larger towns as well as on nearby game farms, commercial farms and timber plantations.

Almost all villages have at least one primary school and fourteen of the twenty-one villages have a secondary school. Over 40% of adults 25-59 years have received no formal schooling. Six percent have completed secondary school and only 3% have proceeded to some form of post-secondary education. Of those aged 15 –24 years almost all have attended primary school but only 46% have made the transition to

secondary school. Although 85% of 10-14 year olds were enrolled in primary school, age of enrollment is frequently delayed. Adult female literacy (56%) is somewhat lower than adult male literacy (62%) (Collinson et al 2006).

Various types of housing are found, ranging from traditional mud huts to brick dwellings with tin or tiled roofs. Electricity and telephone services, though seriously lacking, are benefiting from recent development initiatives.

A health centre with five satellite clinics exist in the field-site, all staffed by nurses. A restricted number of drugs are dispensed from each of these primary care facilities, and the health centre has a small laboratory, able to perform a limited number of diagnostic tests. An ambulance is based at the health centre. All services are free, and include child health, family planning, ante-natal care, delivery and post-partum care, minor ailments and chronic disease treatments. Although waiting times are long, most of these services are under-utilized. A contributing factor is poor drug supply. Referrals are to two district hospitals, each about twenty-five kilometers from the health centre. The main health problems revealed by verbal autopsy analysis are diarrhea, kwashiorkor and AIDS in children under five; accidents, violence and AIDS in the 15-49 age group; and chronic degenerative diseases, mainly cardiac, cerebro-vascular, liver and malignant diseases, among those fifty and above (Kahn et al 1999). Malaria infection is also prevalent in this region. A high rate of adolescent fertility exists in the midst of escalating HIV sero-prevalence (Garenne et al 2000).

Forced relocation of communities under the apartheid regime, in the 1940-1960 period, followed by the formation of ethnically divided homelands in the 1970's, has had a significant impact on the social, economic and demographic profile of the population.

Densely settled rural villages, with cash-based economies were the resultant pattern of settlement, with males aged 20 and 59 years largely absent from the permanent population. Recent changes in government have affected movement patterns. With more freedom of movement people are tending to move to rural towns. These towns are becoming development nodes along paved roads through these rural areas.

Study design:

The research was conducted using the Agincourt Demographic and Health Surveillance System data set (ADHSS), Data on union episodes and information on cause of death collected from verbal autopsy were used for the analysis. A verbal autopsy is a method used to determine the cause of death of an individual based on an interview from a surviving household member (Kahn et al 1999). Questions on the symptoms experienced by the deceased spouse were asked from the person who took care of the deceased before his or her death and after wards the answers were forwarded to 3 different medical practitioners for evaluation and they gave a probable cause of death. As such the two that corresponds will be taken as cause of death. The research is going to be done quantitatively, because the data available allow for the use of proper statistical analysis to determine the relationships/association between variables. The data used was retrospectively collected in 2005 and updated (prospectively) in 2006.

However, retrospectively collected data set are prone to bias such as mis-reporting example under-reporting in the case of age, dates etc.

Data collection:

The Agincourt demographic and health surveillance system (ADHSS) has in its database a record of all households in the community. The questionnaire for the study is a union form used by the ADHSS to collect information on the union episode and other socio economic characteristics of respondents. Therefore, individuals migrating and immigrating, union episodes, educational level, and demographic background etc in the community are up-dated regularly. The union form questionnaire was used to collect information on marriage occurrence within the community. Union episodes describe the number of marriages occurring within the community. In addition, Verbal autopsy records were used to collect information on cause of death. Verbal autopsy is an important method for deriving cause-specific mortality estimates were disease burdens are greatest and routine cause-specific mortality data do not exist (Setel et al, 2006).

The sample for the analysis was dependent on the total number of individual who reported that their previous marriage had ended in that community, otherwise, they are at risk of remarrying. The information collected was on individual union episodes, socio economic status, and age of respondents at union dissolution and cause of death from verbal autopsy.

Data analysis:

The analysis section of the research report was executed in three stages.

1. Using STATA analytic package, a descriptive analysis that gave the background characteristics of the dataset used., which describe the variables i.e. spouse age at exit from previous marriage, cause of death (due to AIDS and due to non-AIDS), marriage order, sex, type of previous marriage (formal or informal), end type of previous marriage (widowed or divorced), calendar year (year of exit from previous marriage), and educational attainment – categorized into no education, primary education, secondary education, and tertiary education, and as a result a better understanding of the population distribution in the dataset.

2. The second phase is the bivariate analysis, which deals with the relationship between the remarriage rates of those whose spouses died of AIDS and those whose spouse died of non-AIDS related causes. In addition, a statistical technique (multiple decrement life tables) which controls for persons entering or leaving the cohort at any point in time was used to determine the remarriage rates among males and females. Remarriages among widowed and divorcees were also illustrated with charts (Kaplan Meier survival curve). A log rank test of significance was done to check for statistical significance. Finally, Cox regression analysis involving two variables at a time was done to determine individual contribution of the independent variables to remarriage.

3. The third stage involves a Cox regression model; in which all the variables was fitted in the model i.e. dependent variable remarriage (widowed/divorce) * duration (since end of previous marriage), against the independent variables spouse age at union dissolution, cause of death (AIDS/ non-AIDS related), end type of previous marriage (widowed/ divorced), marriage order, type of previous marriage (formal or informal), educational level, calendar year (year of exit from previous marriage) and sex. An interaction term between sex and end type of previous marriage (widowed or divorced) was included. Finally, a correlation matrix was done to check for correlation among variables.

Study limitation:

1. The HIV status of the surviving spouse was not recorded (for those widowed).

2. In the data used, questions on motives/behavior for remarrying were not included. This would have giving insight into the health status of the respondents.

3. This report is in large part based on a dataset of marriage intervals. Some individuals contribute more than one interval to that dataset (see Table 1). The observations are therefore not statistically independent, and standard errors may be biased. However, the number of individuals that contribute more than one marriage interval is just 6.2%. Because of their small number, the clustering of observations on individual will be ignored.

Chapter 4: Results and Interpretation

Descriptive statistics:

Table 1 shows descriptive statistics of the data used for the study. The data consist of 7535 respondents who had ended their previous marriage either through divorce, separation or widowed and are at risk of remarrying. Almost 75 percent of the respondent's previous marriages were formal, while 25 percent had informal marriages. 77 percent of the respondents are female. In addition, out of the 7535 that has ended previous marriage, almost half of the respondents reported been widowed (48 percent) compared to 52 percent who were divorced. The proportion of female widows seems to be higher than male widows (24 percent and 55 percent respectively). Among those widowed about 68 percent of the respondent's spouses died of non-AIDS related causes, while 33 percent of the respondent's spouses died of AIDS. Further analysis reveals that out of 7609 respondents whose previous marriage had ended less than ¼ remarried (19%). In addition, out of 1,448 respondents who remarried, slightly more than ½ of them reported having formal marriages (59 percent), while 41percent had informal marriages. All of the respondents had ended their first marriages at the time of the survey, and almost ½ the population had no education (48 percent), less than ¼ had primary education (22 percent) and slightly above ¼ had secondary education. Lower proportion reported attaining tertiary education (0.23 percent).

Furthermore, the analysis reveals that majority of the respondents spouses died from non- AIDS related causes (68%). However, further analysis cause of death by gender

was done, the result suggest that many women were made widows (69%) by the death of their husbands due to AIDS.

Table 1: Background Statistics of Agincourt data 2006 (N = 7535)

	Frequency	Percent
Age of respondents		
Minimum Age 15 years		
Maximum Age 92 years		
Mean Age 38.3 years		
Standard deviation 14.5		
Sex		
Female	5,859	77.0
Male	1,754	23.0
End type of previous marriage		
Divorce	3,963	52.0
Widowed	3,650	48.0
Proportion of male widows	426	24.0
Proportion of female widows	3,223	55.0
Remarriage		
No	6,165	81.0
Yes	1,448	19.0
Marriage order		
First	7,137	93.80
Second	421	5.53
Third	42	0.55
Fourth	9	0.12
Education		
No Education	3,330	48.07
Primary	1,492	21.54
Secondary	2,090	30.17
Tertiary	16	0.23
Start type of previous marriage		
Formal	5,689	74.81
Informal	1.916	25.19
Start type of new marriage		
Formal	851	58.77
Informal	597	41.23
Cause of Death of the deceased spouse (N =415)		
AIDS causes	135	32.5
Non-AIDS causes	280	67.5
Death due to AIDS by sex		
Widowers	16	31.0
Widows	119	69.0

The table 2 describes the correlation between the variables. The result shows that cause of death is negatively correlated with age (-0.3028*) which is significant at 5% level, on the contrary, cause of death is positively correlated with education (0.1298*) also significant at 5% level. Secondly, age has a negative correlation with gender and education (-0.0307 and -0.4351 respectively), but positively correlated with being widowed (0.5103). Thirdly, gender has a negative correlation with being widowed (-0.2593*), but positively correlated to married order and education (0.1952* and 0.1652* respectively). Finally, being widowed is negatively correlated with married order and education (-0.0713* and -0.3424* respectively).

Table 2: Correlation matrix of explanatory variable in the study

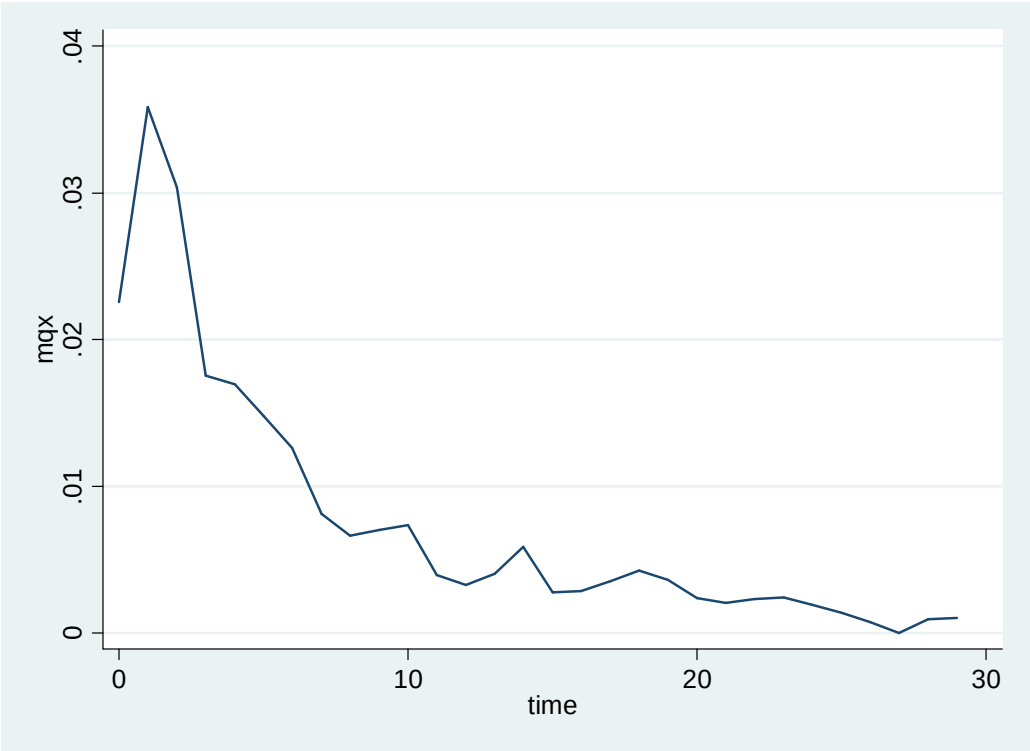
	Cause of Death	Age	Gender	Widow	Married order	Education
Cause of Death cod	1					
Age	-0.3028*	1				
Gender	-0.0142	-0.0307*	1			
Widow	-0.0586	0.5103*	-0.2593*	1		
Marriage order	-0.0668	0.1070*	0.1952*	-0.0713*	1	
Education	0.1298*	-0.4351*	0.1652*	-0.3424*	0.0103	1

*p-value < 0.05

Bivariate analysis:

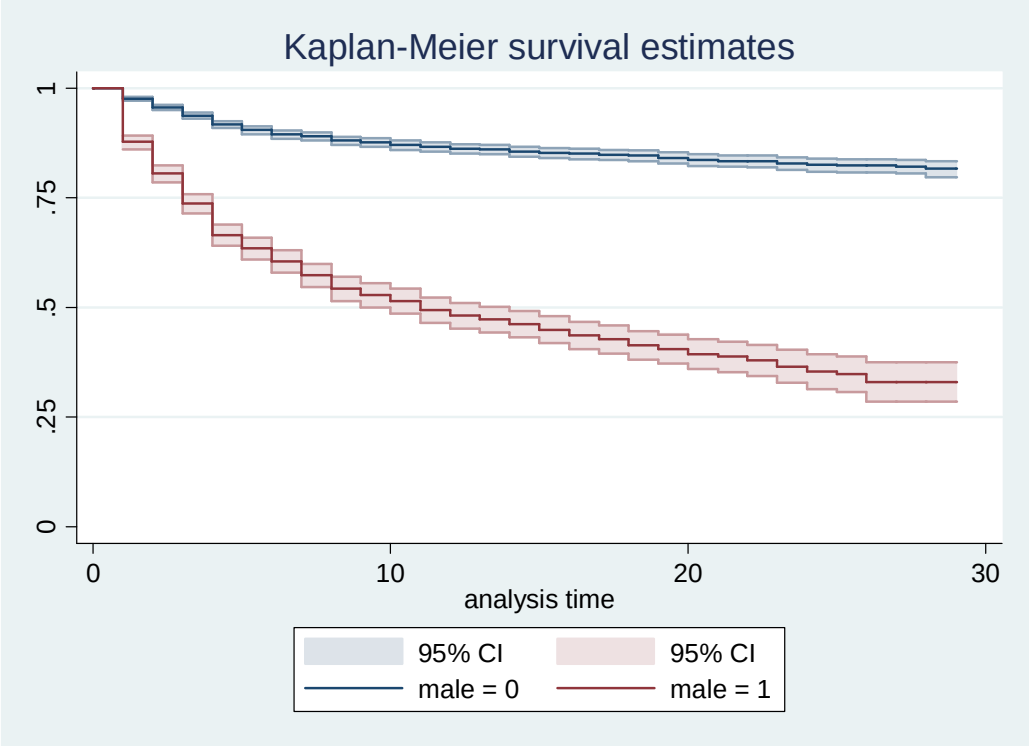
Figure 1 below indicates the remarriages of respondents after exit from previous marriage. The graph indicates that higher remarriage rate was found to be among respondents who remarried within the same year of exit to 5 years after exit from the previous marriage. In addition, the longer it took the respondents to remain single after exit from previous marriage, the less likely they will remarry. In other words, there is a decrease in the remarriage rate as time of exit from previous marriage increases.

Figure 1: Remarriage by year interval (multiple decrement life table)



The figure 2 indicates that remarriage of males are higher than females. In other words, as people remarry the probability of remaining single decreases. Conversely, a log-rank test of significance gave a p-value of 0.000 which indicates that there is a significant difference between the remarriage rate of males and females. This confirms past studies that suggest imbalances in sexual power inherent in developing countries. Further more; the graph reveals that about 50 percent of the male respondents remarried after 10 years of exit from previous marriage. While less than 25 percent of female respondents remarried within the same time interval.

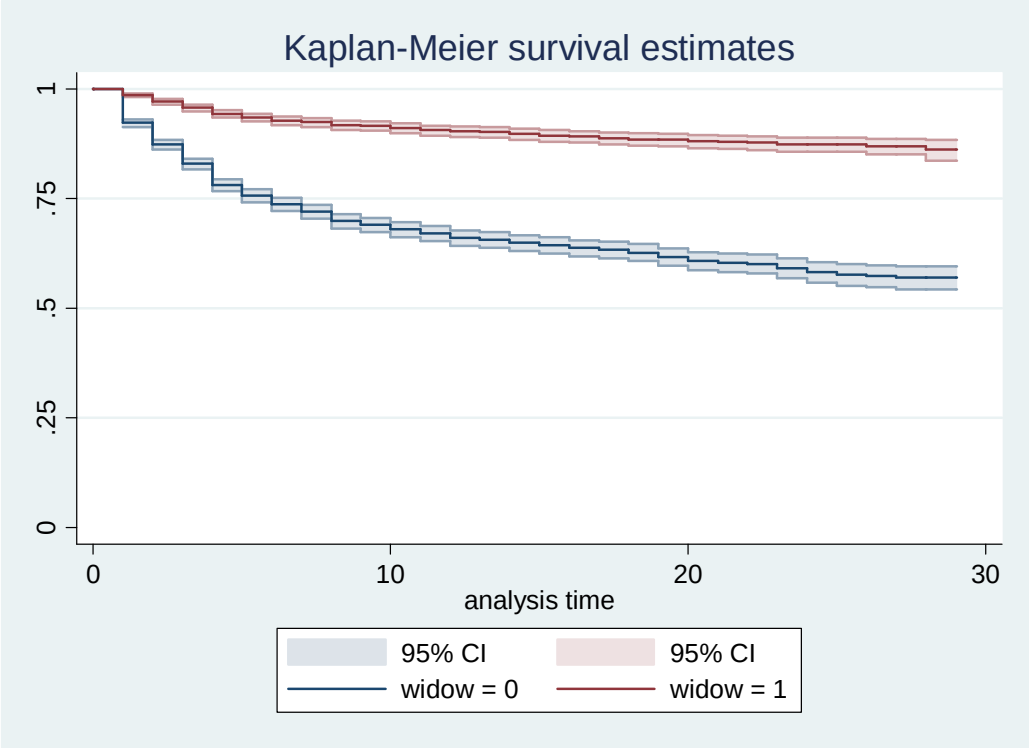
Figure 2: Remarriage by Gender (Kaplan-Meier survival estimates)



Where male=0 represents females, male=1 represents males

The figure 3 below shows that overall; widows are less likely to remarry than those who are divorced. Equally, a log-rank test of significance gave a p-value of 0.000 which indicates that there is a significant difference between the remarriage rate of those who are widow and divorced. Further more; the graph reveals that more than 25 percent of divorced respondents remarried after 10 years of exit from previous marriage. While less than 25 percent of widowed respondents remarried within the same time interval

Figure 3: Remarriage by respondents who are widowed and divorced (Kaplan-Meier survival estimates

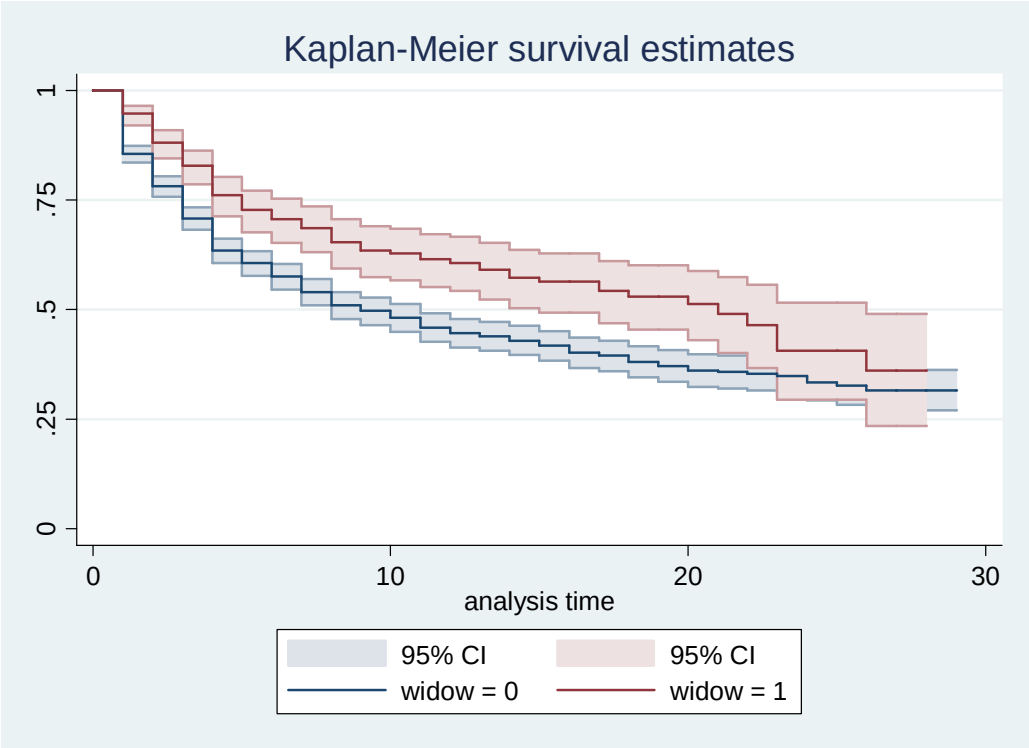


Where widow=0 represent divorced and widow=1 represent widowed

Figure 4 below indicates that males who are divorced are more likely to remarry than males who are widowed. However, a log-rank test of significant indicates a significant difference in remarriage of divorced and widowed males. Although widowed males also remarried, it will be worthy of investigation to note the number of widowed respondents who remarried if their spouse died of AIDS or other causes. Further more; the graph reveals that more than 50 percent of divorced male respondents remarried after 10 years of exit from previous marriage. While less than 50 percent of widowed male respondents remarried within the same time interval. Though as the time these

individuals remain at risk of remarriage increase (about 30 years), both male widows and divorced males chances of remaining unmarried decreases.

Figure 4: Remarriage of males who are widowed and divorced (Kaplan-Meier survival estimates)

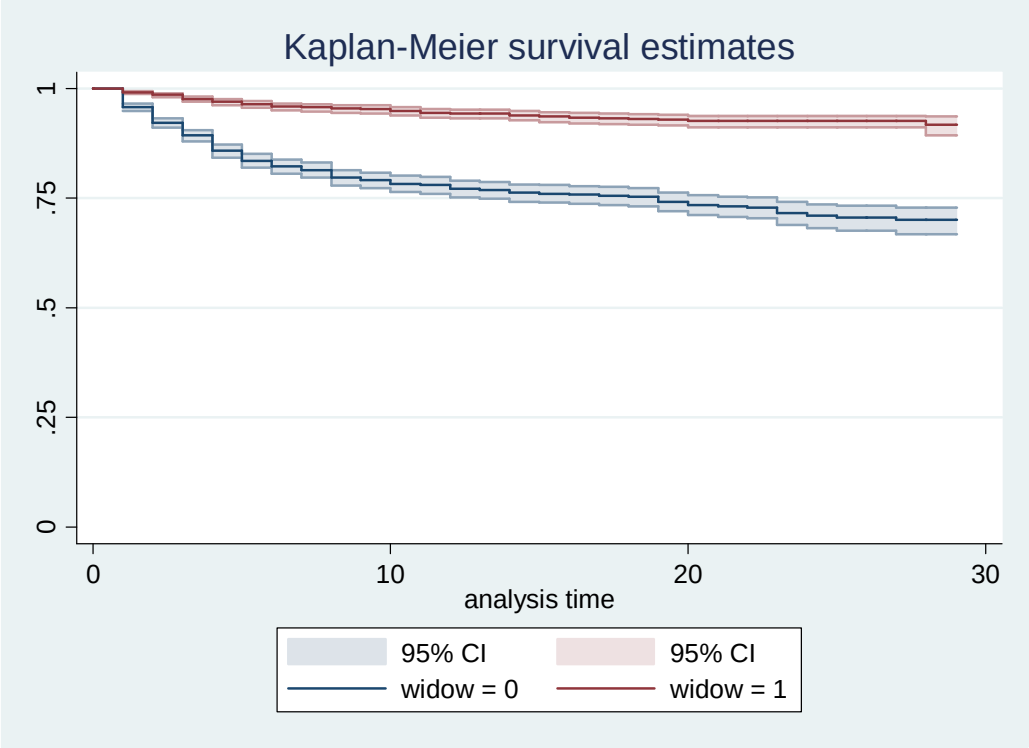


Where widow=0 represent divorced males and widow=1 represent widowed males

Similar to figure 3, figure 5 below indicates that females who are divorced are more likely to remarry than females who are widowed. Also, a log-rank test of significant indicates a significant difference between divorced and widowed females. Furthermore, unlike widowed males, widowed females remarried more. Further more; the graph reveals that about 25 percent of divorced female respondents remarried after 10 years of exit from previous marriage. While the probability of widowed female respondents remarrying within the same time interval becomes negligible. Though as the time these individuals remain at risk of remarriage increase (about 30 years), divorced females

chances of remaining unmarried becomes decreases. While widowed females remains almost constant.

Figure 5: Remarriage of females who are widowed and divorced (Kaplan-Meier survival estimates)



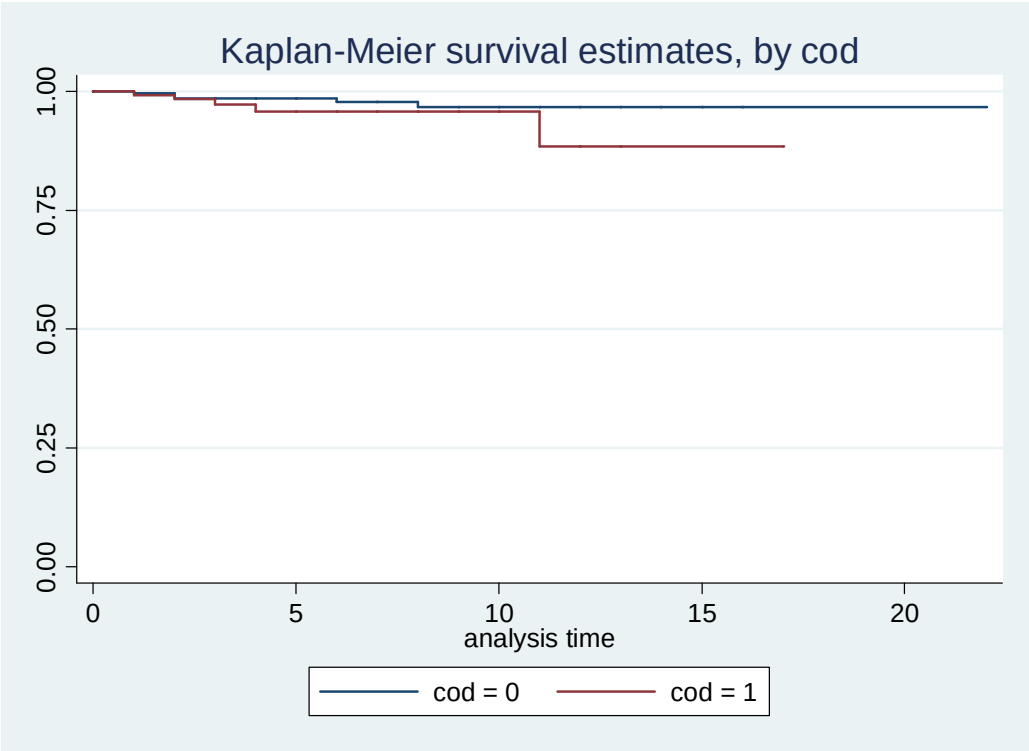
Where widow=0 represent divorced females and widow=1 represent widowed females

The data inquired into the cause of death of spouse derived from verbal autopsy and the results were grouped into AIDS-related and non-AIDS related deaths. Figure 6 represent the probability of respondents whose spouses died of AIDS and those whose spouses died of non-AIDS related, remaining single after exit from the previous marriage (were cod=0 represents those whose spouses died of non-AIDS and cod=1 represents those whose spouses died of AIDS). However, the sample was restricted to those whose spouses had died. The result therefore showed that those whose spouses died from AIDS related causes had a slightly higher remarriage rate than those whose

spouses died of non-AIDS related causes. Conversely, a log-rank test of significance gave a p-value of 0.23 which indicates that there is no significant difference between the remarriage rate of those whose spouses died of AIDS and those whose spouses died of other causes. A deeper analysis of the probability widows whose spouses died of AIDS and those whose spouses died of non-AIDS causes remaining single after exit from the previous marriage, reveals that those widows whose spouses died of AIDS had a slightly higher remarriage rate than those whose spouses died of other causes. On the contrary, a log-rank test of significance indicates that there is no significant difference between the remarriage rate of widows whose spouses died of AIDS and those whose spouses died of non-AIDS causes. On the other hand for male widows, those whose spouses died of AIDS had a slightly higher remarriage rate than those whose spouses died of non-AIDS causes. Similarly, a log-rank test of significance indicates that there is no significant difference in remarriage rate of widowers whose spouses died of AIDS and those whose spouse died of non-AIDS causes.

These could be due to the very small number of respondents observed : the total number of respondents in this case was 415, and only 11 of them remarried, (the total number of female respondents in this case was 363, only 5 female respondents actually remarried while male respondents in this case was 52, only 6 male respondents actually remarried).

Figure 6: Remarriage by cause of death (Kaplan-Meier survival estimates)



Where cod=0 represent non-AIDS related causes and cod=1 represent AIDS deaths

The bivariate models using a Cox regression analysis of the individual variables against remarriage rate is shown in table 3. The results indicate that as the respondents get older, the less likely they will remarry. A P-value of 0.0000 indicates that there is a significant relationship between remarriage rate and age. However, when the effect of age square was introduced, the result did not give a quadratic relationship. Hence, age has a linear relationship with remarriage rate.

The remarriage hazard of males is 5.5 times that of female, indicating that males are about 6 times more likely to remarry than females. A test of significance reveals that there is a significant relationship between remarriage rate of males and females (p-value < 0.05).

Those whose spouses died of AIDS are 2 times more likely to remarry than those whose spouses died of non-AIDS causes. P-value of 0.19 indicates that there is no significant relationship between remarriage rate of those who spouses died of AIDS and those whose spouses died of other causes both at 5% level and 10% level. Though, the number of those who reported that their spouses died of AIDS obtained from verbal autopsy were very small (11), hence very weak statistical power. Widows are less likely to remarry as opposed to divorced. P-value < 0.05 indicates that there is a significant relationship between remarriage rate and end type of previous marriage.

From the table, it can also be seen that for marriage order those who exited twice from their marriages are 2 times more likely to remarry than those who exited once. Likewise those who exited thrice from their previous marriage are 2 times more likely to remarry than those who exited once. Furthermore, for those who exited more than three times are less likely to remarry than those who exited their previous marriage only once (lower marriage order). In other words remarriage rate is proportional to higher marriage order.

The analysis also explores the relationship between educational level and remarriage rate. It was found that the higher the educational attainment of an individual the more

likely they will remarry. However, those who have attained higher (tertiary) education have a higher hazard for remarriage than respondents who have attained primary or secondary.

Analysis on respondents whose previous marriage started as either formal union or informal union revealed that those who had formal marriages are less likely to remarry than those who had informal marriage. People are more likely to re-enter new relationship when there are no marital vows involved in the previous union.

Further analyses of period effect suggest that during the era of AIDS people were more careful in remarrying for fear of contracting HIV. The result reveals that respondents who exited their marriage in the 1990 and above had a lower remarriage rate than those whom their previous marriage ended between 1961 to 1989 (0.81 which is statistically significant p-value < 0.05). while those who exited their previous marriage in the 1960's and below had a higher remarriage rate than remarriage rate than those whom their previous marriage ended between 1961 to 1989 (1.71 which is statistically significant: p-value<0.05).

Although, factors such as political (end of apartheid), social (increase in women's educational status) and economic (changes in employment opportunities for women) factors may be the reason for the change in marriage and remarriage norms during this era. As result, a need for further research into other factors that may be responsible for the marriage or remarriage change.

Table 3: Model 1 Proportional hazard regression model for variables predicting remarriage

Variable	Hazard ratio
Age of respondents at time of exit form previous marriage N= 7535 (single years)	0.95**
Sex (N= 7535)	
Females (Reference category).	
Male	5.50**
Widowhood (N= 7535)	
Divorced (reference category)	
Widow	0.23**
Marriage order N= 7535	
First (Reference category).	
Second marriage	1.87**
Third marriage	2.21**
Fourth marriage	0.82
Education N=6862	
No Education (Reference category).	
Primary	1.88**
Secondary	2.18**
Tertiary	2.67*
Exit year of previous marriage (calendar year)	
Between 1961 and 1989 (reference category)	
1960 and below	1.71**
1990 and above	0.81**
Start type of previous marriage N= 7535	
Informal (Reference category).	
Formal	0.60**
Cause of Death N=415	
Non-AIDS (Reference category)	
AIDS	2.05

** P- value < 0.05, *p-value < 0.1.

Model 2 investigates the effect of widowhood on remarriage by sex. The result shows that males are 3 times more likely to remarry than females; a p-value of 0.000 indicates a significant difference between male and female remarriage. In addition, respondents who are widowed are less likely to remarry than respondents who were divorced. The p value shows a significant difference between remarriage of widows and divorced. Furthermore, the interaction term p-value indicates a significant difference between widowers and widows. Here, widowers are 3 times more likely to remarry than widows.

Table 4: Model 2: Interaction term male*widow (the effect of widowhood on remarriage by sex)

Time	Hazard Ratio
Male	3.30**
Widow	0.21**
Male*Widow	3.08**

***Multivariate analysis*:**

Table 4, the Cox regression model, age (Hazard ratio=0.95), gender (Hazard ratio=4.54), widowhood (Hazard ratio=0.58), those who remarried twice (Hazard ratio=1.67) and respondents with secondary education (Hazard ratio=0.82), showed a significant relationship with remarriage rate. For those with tertiary education (Hazard ratio=1.67) the p-value did not give a significant relationship with remarriage at 5%. This could be due to the small observation number for those with tertiary education (n=16).

Table 5: Model 3 Proportional hazard regression model for variables predicting remarriage (multivariate analysis) n= 6859

_t	Hazard Ratio
Age at Exit of Previous Marriage	0.95**
Sex	
Female (reference category)	
Male	4.54**
End type of previous marriage	
Divorce (reference category)	
Widow	0.58**
Male*widow (interaction)	3.12**
Marriage order	
First marriage (reference category)	
Second marriage	1.67**
Third marriage	1.27
Fourth marriage	0.55
Educational Attainment	
No education (reference category)	
Primary Education	0.89*
Secondary Education	0.82**
Tertiary Education	0.99
Type of previous marriage	
Informal marriage (reference category)	
Formal Marriage	1.05
Exit year of previous marriage	
Between 1961 and 1989 (reference category)	
1990 and above	0.02**

** P- Value < 0.05, *P- Value < 0.1

Table 5 below indicates that for gender (male), the remarriage hazards for males are about 6 times higher than for females. The p-value shows that there is a significant relationship between remarriage rate and Gender.

The older the respondents get the less likely they will remarry (0.93). This suggests that younger individuals who are either widowed or divorced will likely remarry rather than remaining in a single state.

In addition, widows are less likely to remarry as opposed to divorced individuals in this case the p-value 0.015 gave an indication of significant relationship at 5% level.

Lastly the remarriage hazard for cause of death (1.41) indicates that those whose spouses died of AIDS have a higher remarriage hazard than those whose spouses died of other causes. However, cause of death has no relationship with remarriage rate (p-value of 0.69). However, it is worth to note that widows that the cause of death of their spouses was known are few (415 respondents of whom only 11 remarried). Thus, very little statistical power to do the analysis.

Table 6: Model 4 Proportional hazard regression model for variables predicting remarriage with cause of death included (multivariate analysis) N=415

_t	Hazard Ratio
Age at Exit of Previous Marriage	0.93
Sex	
Male	6.16**
End type of previous marriage	
Divorce reference category	
Widow	0.08**
Marriage order	
Marriage order (twice)	1.11
Marriage order (Thrice)	6.71
Educational Attainment	
Primary Education	0.07
Secondary Education	1.15
Cause of Death	
Non-AIDS related deaths (reference category)	
AIDS related death	1.41

** P- Value < 0.05

Chapter 5: Discussion and conclusion

This study sought to answer the following questions: does being a widow or divorcee have an influence on remarriage rate in South Africa? Secondly, does partner's death from AIDS have any effect on the remarriage of the surviving spouse? Does age influence remarriage rate in South Africa?

The study has shown that divorced individuals have a higher remarriage rate than widowed and the proportion of female widows is higher than the proportion of male widows. The fact that males have higher adult mortality than females is likely to be exacerbated by HIV/AIDS and a likely cause of these differences in the proportion widowed among males and females. It is also evident that men are more likely to remarry than women. Other literatures that found similar relationship between the remarriage rate of male widows and female widows. For example, Ntozi (1997) in the analysis of Uganda data found that widowers have higher remarriage rate than widows, and Adetunji (2001) found that male and female widows whom their spouses died of AIDS are more likely to remarry than those whom their spouses died of non-AIDS related causes. Suggesting the dynamics in sexual power that is evident in an African patriarchy society in which people view women who remarry as violating the cultural norms but men can remarry without the society frowning at them.

The result of the study suggests that there is no relationship between those whom their spouses died of AIDS and those whom their spouses died of non-AIDS related causes.

This could be due to the small observation number for those whose spouses died of AIDS and eventually remarried (11 respondents). Similarly, there was no significant difference between widows whose spouses died of AIDS and those whose spouses died of non-AIDS related causes. The result suggests that widowed females whom their spouses died of AIDS rarely remarried in this community as opposed to males whose spouses died of AIDS. The likely reason for this outcome as argued by Adetunji (2001) is the fact that the stigma associated with AIDS may force some of them to migrate or remain in the community and face the risk of isolation. Another probable explanation may be due to cultural practices in this community restricting the remarriage of widows; however the data do not provide enough evidence to explore this possibility. Therefore, from the study it can not be concluded that those whose spouses died of AIDS are more likely to remarry than those whose spouses died of other causes. In spite of this, the small number of individuals whose spouses died of AIDS that remarries still poses a threat to the spread of HIV. For example, Ntozi (1997) in the analysis of Uganda data found that widows and widowers whose spouses died of AIDS remarried. This is particularly true as argued by Deborah et al (2007), that new patterns of biological death has emerged due to eroded traditions which frown against immoral sexual behaviours. People sexual behaviour are no longer detected by the society in which they live but rather base their way of life on the freedom and rights democracy has provided

In addition, the study also explored the effect of age on remarriage rate, as many researchers have noted that it is an important factor. The results show that the older the individual get after being divorced or widowed, the less likely they will remarry.

However, many researchers have argued that the risk of becoming widowed increases with age. This was confirmed from the result which indicated that 64% of respondents whose ages are 30 and above were widowed. Only 36% of this age group were divorced. Furthermore, the result show that the longer the respondents remain widowed or divorced, the less likely they will remarry. Finally, when the period of exit from previous marriage was considered, it was found that those whose previous marriage ended during the era of HIV/AIDS pandemic (1990 and above) were less likely to remarry than those whose previous marriage ended between 1961 and 1989, while those who exited their previous marriage 1960 and below were more likely to remarry than those who exited their previous marriage between 1961 and 1989. This shows that HIV/AIDS has sensitized individuals about selection of partners into unions.

A limitation of this paper is that it relies in great part on retrospectively reported marriage histories (collected in 2005 and updated prospectively in 2006 from the Agincourt Demographic and Health Surveillance Site ADHSS). Retrospectively reported marital histories are subject to a range of biases such as a greater propensity to omit short unsuccessful unions from marriage histories as time passes, as well as the accuracy in reporting of ages and dates of exit from previous marriages.

In conclusion, most HIV prevention efforts have been aimed at individuals with multiple sexual partners, and few studies have seen marital unions as a means for the spread of HIV were condom is far from being accepted as a suitable preventive tool; especially the remarrying of widows and widowers whose spouses died of AIDS whom might become sources for further infection with the virus if their diseased spouses had

infected them. Therefore, a great need for further research into the impact of HIV on the remarriage of widows and divorced when sufficient information on cause of death is made available.

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