Effect of HIV status on fertility intention and contraceptive use among women in 9 sub-Saharan African countries: Evidence from demographic and health surveys

By

Joyce N. Mumah[1], Abdhalah Ziraba[1] and Estelle Monique Sidze[1]

[1]African Population and Health Research Center

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ABSTRACT

Expanding access to ART means that HIV is no longer a death sentence. This change has implications for reproductive decisions and behaviors of HIV infected individuals. Using multiple rounds of biomarker data from DHS in 9 SSA countries, we compare patterns of associations between fertility intention, modern contraception use and HIV status. Preliminary results show no clear consistent pattern of fertility intention and modern contraceptive use by HIV status, with variations observed across countries. However, for Rwanda and Zimbabwe HIV+ women with knowledge of their status had lower odds of wanting more children. Similarly, only in Rwanda were HIV+ women who knew their status more likely to be current users of contraception. The reverse was observed for Zimbabwe. The assumption that reproductive intention and behavior of HIV+ women will differ compared with HIV- women may therefore only hold true to the extent that women know their HIV status.

Introduction

About 70% of the 34 million people living with HIV globally in 2011 resided in sub-Saharan (SSA) Africa, with women comprising 58% of persons HIV infected (UNAIDS, 2012b). These disproportionately higher rates of HIV among women of reproductive ages in SSA have implications not only for health but also for life course transitions such as childbearing (Laher et al., 2009), an important marker for women in SSA.

HIV acquisition in most SSA countries is usually among young women, who are yet to start childbearing, and therefore likely to state a pregnancy desire. However, studies on fertility desires among HIV positive women have produced varied results, indicating a complex relationship between HIV status and fertility. On the one hand, numerous studies show that fear of disease progression and welfare of children influences pregnancy desires of HIV infected women. For example, studies in Malawi, Uganda and Zambia, show that HIV status was associated with low fertility intentions and low contraceptive use (Hoffman et al., 2008; Homsy et al., 2009; L. Myer, Rebe, & Morroni, 2007; Nakayiwa et al., 2006). Similarly, in Malawi, desire for future children declined with HIV diagnosis (Hoffman et al., 2008), while majority of newly diagnosed women in the United States, chose not to become pregnant, after learning their HIV status (Craft, Delaney, Bautista, & Serovich, 2007). Conversely, studies in South Africa showed that potential childbearing had more of a psychological effect as having a child was considered a reason for living, while pregnancy rates were about the same for women living with HIV and AIDS (WLHA) and general population in Burkina Faso (Cooper, Harries, Myer, Orner, & Bracken, 2007; Nebié et al., 2001).

Fears associated with childbearing in some cases can be attributed to two factors according to Laher et al. (Laher et al., 2009); the lack of educational materials on this topic and the attitudes of health care providers toward HIV and fertility. With regard to providers, evidence from South Africa and the US indicates that providers' failure to relay accurate information on reproductive health to WLHA, which is not tainted by their own personal bias, not only plays a major role in fear of childbearing among WLHA, but also on the decision to keep a pregnancy (Cooper et al., 2007; 2007). Other studies have found that factors such as income, treatment, length of clinic attendance, time since diagnosis, disclosure status to partner and recent CD_4 count, misinformation from peers and providers, and the potential fear of Mother-To-Child transmission (MTCT) reduced the desire for children among HIV infected women (Nattabi, Li, Thompson, Orach, & Earnest, 2009; Oladapo, Daniel, Odusoga, & Ayoola-Sotubo, 2005).

There is evidence indicating that increased life expectancy as a result of HAART and the associated health restoration and the reduced risk of vertical transmission to babies through prevention of mother to child transmission (PMTCT), is associated with higher childbearing desires amongst women living in SSA. In a multi-country comparison of South Africa, Brazil, and Uganda for instance, it was observed that sexually active women using HAART were both more likely to desire pregnancy and to practice protected sex, thereby affecting actual childbearing (A. Kaida et al., 2008). Time since diagnosis seemed to be an especially important predictor as adjustment to recent diagnosis is yet to affect the woman's identity and wanting a child was used as a coping mechanism (Oladapo et al., 2005). However, the time between improved health status once on HAART, may only increase fertility desire but may have no impact on actual fertility as noted by Maier and colleagues (2009) in their study on HIV positive women in rural Uganda.

Whether specified or not, pregnancy intentions may affect contraceptive utilization, and among women living with HIV the decision to use contraception is complex, not unidirectional and affected by several factors. Studies in Malawi and Uganda found for instance low stated desire for pregnancy among HIV positive women, but also found low contraceptive usage (Hoffman et al., 2008; Homsy et al., 2009; Taulo et al., 2009). Similarly, in Zambia, there were high rates of contraceptive discontinuation among women living with HIV (Mark et al., 2007). Using nationally representative data of ten African countries, Bankole and colleagues (2011) however, observed high use of condoms at last sex among HIV positive women who knew their status compared with HIV negative women for four of the ten study countries. It is noted that among HIV positive women, limited or non-use of contraception could be impacted by health and side effect concerns, especially the fear that contraceptive use could impact HIV disease progression (Bankole et al., 2011). Similarly, it is argued that myths about interaction between some contraceptive methods and HAART influenced uptake of contraception (Nattabi et al., 2009).

In sum, there is no consensus on the associations between fertility desires, contraceptive use behavior and HIV status. Shedding more light on these associations in SSA countries is of particular importance since HIV incidence increased by almost 31 percent among young women 15-24 years (UNAIDS, 2012a), who are just beginning their childbearing life. Comparative studies using DHS data (Bankole et al., 2011) have only utilized one round of the data to assess these associations and it will be important to assess the changes over a more expanded period of time. This study therefore propose to investigate the associations between HIV status and probable knowledge about HIV status on fertility intention and current contraceptive behavior for women in 9 sub-Saharan African countries. We will further the previous analyses by providing a comparison between countries and changes in these associations, using two survey periods for each country, over a span of 10 years. Findings are expected to inform service provision to meet the needs of HIV positive women.

Methods

Data

This study uses data collected by the Demographic and Health Surveys in 9 sub-Saharan African countries that have linkable information on HIV testing, fertility preferences and contraceptive use in at least two surveys in the same country. The countries that met the criteria are: Cameroon (2004 and 2011), Ethiopia (2005 and 2011), Guinea (2005 and 2012), Kenya (2003 and 2008/09), Lesotho (2004 and 2009), Malawi (2004 and 2010), Rwanda (2005 and 2010) and Zimbabwe (2005/06 and 2010/11).

Design/sampling

Demographic and Health Surveys (DHS) are nationally representative surveys that are carried out approximately every five years in several developing countries that lack data on health and social indicators. All the country surveys have similar core modules, however, other specific modules are added or modified depending on the differing needs and priorities of countries. HIV testing has been included since the early 2000's in various countries, with most high HIV prevalent countries having implemented at least one in the standard DHS survey or a similar survey such as the AIDS Indicator Surveys. For this study, the Standard DHS with HIV testing were used as the AIDS Indicator Surveys do not have adequate reproductive health data needed for the analysis.

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The DHS uses a multi-stage complex cluster sampling methodology to achieve a nationally representative sample of households in the respective countries. All women of reproductive age 15-49 years in sampled households are interviewed. Modules implemented often ask questions about household characteristics, reproductive, contraceptive history and mortality among women of reproductive age, health, nutrition and mortality of all children under-five. Depending on country needs, other modules implemented include taking of biomarkers for HIV, hepatitis, syphilis and micronutrients, sexual gender based violence among others. In this analysis, we use data collected in standard DHS surveys that collected blood for HIV testing and where the results are linkable to the individual woman and household level information. Data from DHS surveys and associated documentation are publicly available from the DHS measure website upon making an official application indicating intended use (www.dhsprogram.com).

Study population

The study population consists of women aged from 15 to 49 years who provided information on their reproductive history and blood sample for HIV testing. Normally all women in the sampled households within the age bracket and have had a birth in the last five years are interviewed, while HIV testing is for all women in sampled households. However, because some of the eligible women did not consent to providing a blood sample for testing, the woman file with reproductive data does not exactly match that for HIV testing. The non-matching cases are therefore excluded from the analytical file used for analysis.

Measures

Outcome variables

This study has two outcome variables: fertility intention and modern contraceptive use. Fertility intention is derived from a question to women on whether they wanted to get more children or not. For the analysis, a dichotomous variable was created with the value of 1 if a woman said 'yes' (i.e. she intended to have more children) and 0 if a woman said 'no'. Women who said they were unsure were very few and dropped from the analysis. Similarly, women who indicated that they were infecund or sterilized were also excluded from the analysis. The variable for contraceptive use is derived from a question to all married or sexually active unmarried women on whether they are currently using any modern family planning method to delay or avoid getting pregnant. For the analysis, the variable takes on a value of 1 if a women said 'yes' and 0 if a women said 'no'.

Predictor variables

The key predictor variable in this study is the woman's HIV status. HIV testing in DHS is carried out using standard protocols in accredited laboratories. Quality assurance and control is done by having all HIV-positive specimens and about 5 percent of the sample of HIV-negative specimens re-tested at a different laboratory using the same testing protocol (Mishra, Medley, Hong, Gu, & Robey, 2009). For the purposes of this analysis, HIV status has been grouped into four categories, taking into account if the woman knew her HIV status at time of the survey. This was deemed important as it may influence her fertility and contraceptive use choices. The four categories are: HIV negative and knew status; HIV negative and didn't know status; HIV positive and didn't know status; and HIV positive and knew status at time of survey.

Control Variables

In examining the associations between HIV status and probable knowledge about HIV status on fertility intention and current contraceptive behavior, our multivariate analyses includes the following control variables: Current age (*15-19; 20-24; 25-29; 30-34; 35 and above*), level of educational attainment (*no education, primary, secondary and above*), marital status (*never married, currently married, separated/divorced/widowed*), number of living children (*0-1; 2-3, 4+*), residence (*rural and urban*) and household wealth status (*lowest-poorest, second, middle, fourth , highest-richest*).

Analysis

HIV sero-data were merged with the woman individual file which also contained household variables to create an analytical file. Variables were recoded appropriately and uniformly across countries and across surveys. Country specific analyses were carried out after merging the HIV test results and woman files, and survey-specific weights applied in the HIV file. Survey-specific weights were used for all country surveys to account for the degree to which a woman's chances of being selected for the sample depended on household size and other DHS sampling criteria. In this abstract we first present descriptive and bivariate results by country and year of survey on women's HIV status, and proportion of women who wanted more children and those currently using contraceptive by HIV status. Further analysis will present other bivariate analysis and logistic regression models on the associations between HIV status and fertility intention and contraceptive use. All analyses were carried out using STATA 13.1, with 5% level of significance.

Preliminary Results

Descriptive and Bivariate Analysis

Table 1 shows the percentage distribution of HIV status taking into account prior knowledge of HIV status from two consecutive surveys. Generally, in the first survey for each country, majority of women were HIV negative and did not know their status. However, in the subsequent survey, this proportion greatly reduced for all countries, significantly so in Lesotho, Malawi, Rwanda and Zimbabwe. For all countries it can be seen that the proportion of women who were HIV negative and knew their status increased between the inter-survey years. Similarly, the proportion of women who were HIV positive and had prior knowledge of their status increased between surveys.

INSERT TABLE ONE HERE

Table 2 shows the proportion of women who wanted more children and those currently using modern contraception by HIV status. The percentages are weighted factoring the survey design in each of the surveys. With the exception of Guinea and Niger, the percentage distribution of women who wanted more children significantly varied by one's HIV status and knowledge of the status (p < 0.05). This was more so the case with the second survey in each of the countries. For example in the 2003 Kenya survey, 61% of women who were HIV positive and knew their status prior to the survey wanted to have more children. In the 2008/09 Kenya survey, the proportion of women who were HIV positive and knew their status prior to the survey and wanted more children dropped to 43%. Similar trends were observed in Malawi and Zimbabwe where the proportion of women who

were HIV positive and knew their status and wanted more children was 48% in 2004 and 41% in 2005/06, but declined to 40% in 2010 and 34% in 2010/11, respectively.

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Discussion

This study uses two rounds of DHS data from nine sub-Saharan African countries to examine the associations between HIV status and women's fertility intention and current use of modern contraception. We particularly explored if women's desire for more children and contraceptive use by HIV status have changed in the last ten years, in the context of expanding coverage of antiretroviral therapy. Results from the two surveys for the nine countries indicate that there is no clear consistent pattern of fertility intention and modern contraceptive use behavior by HIV status after controlling for several confounding factors, with variations observed across countries.

Generally, few similarities can be noted in some of the countries. Except for women in Kenya and Guinea, women who were HIV positive and had prior knowledge of their status reported lower desires for more children than women who were HIV negative and had prior knowledge of their status. This pattern was particularly consistent for HIV positive women who also know their status in countries like Rwanda, Zimbabwe and Malawi who prefer not to have more children compared with women who were HIV negative and knew their status. The three countries, in common, have relatively high HIV prevalence rates among women aged 15-49 years which ranged from 4% in Rwanda to 13% and 18% in Malawi and Zimbabwe, respectively (Malawi National Statistical Office & Macro, 2011; National Institute of Statistics of Rwanda (NISR) [Rwanda], Ministry of Health (MOH) [Rwanda], & International, 2012; Zimbabwe National Statistics Agency (ZIMSTAT) & International, 2012). On the other hand, countries like Kenya, Lesotho and Cameroon with similar HIV infection burden showed no difference in fertility intention by HIV status.

Few countries provided a clear and consistent pattern with regards to fertility intention. Rwanda is one of the countries with a consistent pattern. Specifically, Rwandan women who were HIV positive and knew their status were less likely to want more children and more likely to be using a modern contraceptive method. The reverse is observed in Zimbabwe: women who were HIV positive and knew their status preferred not to have more children, but were also less likely to be using a modern contraceptive method compared with those who were HIV negative and knew their status. Homsy and colleagues in their study in Uganda suggest that the disconnect between low fertility desire and low contraceptive uptake could probably be that the responses to questions on fertility desires could be influenced by social desirability or stigma surrounding childbearing for HIV positive individuals (Homsy et al., 2009) Other authors have argued that low contraceptive use among HIV positive women was based on the perception that they and their partners were infertile due HIV infection (King et al., 2011).

In the case of Rwanda, by 2010 when they collected their most recent DHS survey, it was estimated that its ART coverage had reached about 80% of adults eligible for antiretroviral therapy (UNAIDS, 2013). In contrast, for countries like Malawi and Zimbabwe, estimates by 2010 show that 9 out of 10 people have an unmet need for antiretroviral therapy (UNAIDS, 2013). In fact for many of the countries in this study, the unmet need for ART is quite high. Though speculative because of the cross-sectional nature of the data, it is possible that the observed non-consistent pattern of associations between women's positive HIV status (and knowledge of the status) and reproductive

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desire and use of contraception is a reflection of the differential levels of ART access and regional coverage between and within countries. This could also be a reflection of attitudes and behaviors during a pre-ART period (Landon Myer et al., 2010).

TABLES

Table 1: HIV status and prior knowledge of status from two consecutive surveys per country

Country	Survey year	HIV-ve; knew status	HIV -ve; didn't know status	HIV +ve; didn't know status	HIV +ve; knew status	N = Women tested in the survey
Cameroon	2004	17.9	75.5	4.7	1.9	5,154
	2011	47.2	47.2	1.7	3.9	7,253
Ethiopia	2005	3.2	95.0	1.7	0.2	5,942
	2011	34.7	63.5	0.5	1.3	15,505
Guinea	2005	1.6	96.5	1.8	0.1	3,842
	2012	9.8	88.1	1.8	0.3	4,689
Kenya	2003	11.7	79.6	7.1	1.6	3,271
	2008/9	52.0	40.1	2.1	5.9	3,811
Lesotho	2004	7.2	66.4	22.0	4.4	3,020
	2009	45.9	27.4	7.8	18.9	3,849
Malawi	2004	9.9	76.8	11.5	1.8	2,864
	2010	61.5	25.7	2.5	10.4	7,396
Niger	2006	1.8	97.5	0.7	0.0	4,441
	2012	19.9	79.7	0.2	0.2	5,101
Rwanda	2005	19.4	77.0	2.1	1.5	5,663
	2010	71.6	24.7	0.3	3.4	6,952
Zimbabwe	2005/6	16.6	62.3	15.6	5.6	7,494
	2010/11	46.0	36.3	5.1	12.6	7,852

Table 2: Proportion of women who wanted more children and those using modern contraception by HIV status and prior knowledge of their HIV status

Country	Survey year	Proportion of women who wanted more children					Proportion of women using modern contraceptive				
		HIV -ve; knew status	HIV -ve; didn't know status	HIV +ve; didn't know status	HIV +ve; knew status	Total	HIV -ve; knew status	HIV -ve; didn't know status	HIV +ve; didn't know status	HIV +ve; knew status	Total
Cameroon	2004	77.9	83.4	80.8	80.6	82.2*	23.6	12.0	14.2	21.2	14.4*
	2011	77.4	81.9	77.4	70.9	79.3*	22.4	9.2	10.3	15.9	15.7*
Ethiopia	2005	81.0	62.0	59.2	54.6	62.6*	18.4	9.6	26.7	61.9	10.2*
	2011	70.4	67.0	59.5	57.3	68.0*	26.9	14.4	22.8	29.0	19.0*
Guinea	2005	88.2	80.1	69.7	76.5	80.1	13.9	6.8	16.7	11.4	7.1*
	2012	83.8	83.9	79.0	96.7	83.9	13.4	5.9	10.0	37.3	6.8*
Kenya	2003	58.4	63.3	53.7	61.1	62.0*	35.2	20.7	23.6	35.8	22.9*
	2008/9	54.0	65.6	42.2	43.0	57.7*	36.0	18.1	27.8	24.9	28.0*
Lesotho	2004	44.8	48.6	41.4	38.3	46.0*	40.3	22.9	34.1	38.1	27.4*
	2009	45.0	54.8	36.9	34.1	45.0*	38.8	18.4	38.6	43.5	34.1*
Malawi	2004	65.9	61.1	52.4	47.7	60.2*	30.0	23.1	19.1	18.2	23.2*
	2010	65.2	74.0	49.4	39.9	64.4*	38.6	19.8	18.3	36.1	33.0*
Niger	2006	88.6	90.6	89.8	100.0	90.6§	13.6	4.8	6.3	21.7	5.0*
	2012	92.8	91.3	100.0	87.9	91.6§	24.1	8.1	8.6	16.0	11.3*
Rwanda	2005	65.2	67.5	46.0	35.9	66.1*	10.7	4.1	6.8	16.7	5.7*
	2010	50.1	44.8	48.4	30.3	48.6*	31.7	5.3	15.4	37.1	25.3*
Zimbabwe	2005/6	61.9	68.0	41.1	40.7	61.3*	52.7	35.8	39.4	42.4	39.5*
	2010/11	62.6	74.2	49.7	33.7	62.5*	53.4	24.9	35.6	47.1	41.3*

*Chi-squared statistic assesses the significant differences between the different knowledge status on fertility intention and contraceptive use * p<0.05; § Small numbers <5 in cells for HIV positive*