

Accounting for the widened gap in HIV testing between adolescent and non-adolescent women in Uganda

Stephen Ediru,^{1 2*} Robert Wamala³ and Betty Kwagala²

Abstract

Despite notable increase in HIV testing among Uganda's women from 25% in 2006 to 71% in 2011, HIV testing among adolescent women remains very low at 45.5%. The objective of this study was to assess differences in HIV Testing and receipt of Results between adolescent and non-adolescent women in Uganda. The differences were decomposed into components attributed to variation in characteristics and variation in the effects of characteristics in the two groups. The assessment was based on data sourced from 2011 Uganda Demographic Health Survey. Statistical analysis was done using a non-linear Oaxaca' Blinder multivariate decomposition of the logistic regression.

In the results, the difference in HIV Testing and receipt of Result between adolescent and non-adolescent women was significantly ($p < 0.05$) attributed to both variation in characteristics (57.2%) and variation in the effects of characteristics/ coefficients (42.8%). In particular, the gap in HTR was mainly attributed to variation in characteristics such as ever had sex (34.7%) and ever given birth (31.6%) and variation in effects of characteristics such as education level (-68.8%) and marital status (-12.6%). Based on the findings of the study, government and other development partners need to scale up HIV testing programs targeting adolescents through tackling stigma, increasing on community outreach services and expanding adolescent friendly HIV services center.

Key words: HIV testing, Receipt, Result, adolescents, Non-adolescents, Decomposition

* Correspondence: stephenediru@gmail.com

¹ Department of Population Studies, School of Statistics and Planning, Makerere University, P.O BOX 7062, Kampala Uganda

² Department of Sociology and Social Administration, Kyambogo University, P.O BOX 1, Kyambogo, Kampala, Uganda

³ School of Statistics and Planning, Makerere University, P.O BOX 7062, Kampala Uganda

Full list of author information is available at the end of the article

Background

Recent studies on the determinants of HIV testing among women in Sub-Saharan Africa, Uganda inclusive are routinely assessed statistically using methodologies in which age is only included as a covariate [1, 10,11,12,21]. Certainly, these approaches provide insight into the relative contributions of different age groups [13]. However, these approaches are limited in terms of partitioning differences in HIV testing into a component attributed to variation in characteristics and a component attributed to variation in effects of characteristics between adolescent and non-adolescent women. In particular, the extent to which difference in HIV testing can be attributed to compositional differences between adolescent and non-adolescent remains unanswered. Likewise, the extent to which the difference is attributed to the effect of predictors is yet to be established. This study therefore seeks to decompose the differences in HIV testing and receipt of results between adolescent and non-adolescent women in Uganda into a component attributed to variation in characteristics (endowments) and a component attributed to variation in effects of characteristics (coefficients).

Globally, Human Immune Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) pandemic remains a major challenge to public health [19]. By the end of 2012, an estimated 35.3 million people were living with HIV worldwide [20]. Out of the 35.3 million people, 2.1 million were adolescents, with female accounting for 56 percent [20]. This pattern of HIV infection is not surprising considering the early adolescents' initiation into sexual activity. For instance, in Uganda, 60 percent of young women had initiated sexual activity by age 18 years in 2011 [17].

HIV testing and receipt of results is the gateway to HIV/AIDS prevention, treatment and care programs [19]. HIV Testing has been recommended as a routine health care service for young people [3]. However, evidence shows that 53.3 percent of people living with HIV globally do not know their HIV status and yet timely access to treatment and related prevention services require knowledge of one's HIV status [5]. By 2011, only about 1/3 of young people knew their HIV status [11]. In sub-Saharan Africa, almost 90% of people who tested positive for HIV went on to access Antiretroviral Therapy (ART) and evidence indicates that 76% of people on ART have achieved viral suppression [6]. Research evidence has demonstrated that fear of HIV testing is associated with limited consent, little privacy and breaches of confidentiality [7]. Refusal of HIV

testing among married women has been linked to fear of husband following HIV positive test result while adolescent women may fear test result [2].

Despite tremendous increase in HIV testing and receipt of results among Uganda's women from 25% in 2006 to 71% in 2011, HIV testing among adolescent women has remained very low at 45.5% [16]. Research evidence reveals that acceptance of HIV testing among women is associated with greater number of antenatal care visits, residing in the urban areas, having comprehensive knowledge on HIV and positive partner's reaction for HIV positive result [9]. Twenty-five percent of Uganda's population is comprised of adolescents [17]. Being young and female in Africa tends to increase female adolescents' sexual risks and vulnerabilities to HIV [8]. Increasing access to and uptake of HIV testing is critical to reduce the incidence of HIV and to improve access to treatment and support for sero-positive people. People who are aware of being HIV-positive are less likely to engage in sexual risk behavior and people who receive antiretroviral treatment (ART) and adhere to it are less likely to be infect others [12]. Moreover, stigma is likely to decline because as more people become aware of their sero-status, the better to enhance normalization of diagnosis [12]. Knowledge of one's status is likely to reduce unsafe behaviors [15].

Uganda is one of the Sub-Saharan countries with the highest HIV/AIDS prevalence (7.3%). Women in Uganda bear the biggest burden of HIV prevalence (8.3 percent) compared to men (6.1 percent) [18]. Low HIV testing and receipt of results has been associated with increased risky sexual behaviors, infections and delayed access to early treatment, care and support among women [4].

Basing on Andersen's (1968) model of health care utilization, the determinants of health care utilization can be categorized into; predisposing characteristics, enabling characteristics and needs based characteristics. In his model, the predisposing characteristics include demographics, position in the social class and beliefs in health services. Enabling characteristics include family and community resources, needs based characteristics include perceived and clinically evaluated needs. In this study, predisposing characteristics include women's characteristics such as level of education, marital status, religion and region; enabling characteristics include place of residence

and wealth index; and needs based characteristics include; ever had sex, ever given birth and HIV stigmatizing attitude.

Methodology

The study utilized data from 2011 Uganda Demographic Health Survey (UDHS). As part of the requirements, authors submitted a proposal to DHS Program/ICF International and permission was granted to download and use data for the study. DHS authorized data access, and the data was used only for the purpose of the current study. This data is from a nationally representative sample of households obtained at two- stage cluster sampling (UBOS and ICF International, 2012). The first stage involved the selection of cluster sample; this was followed by selection of households. Stratification of urban and rural areas was taken into account. The UDHS for 2011 was based on four data collection tools but for this investigation only women's questionnaire was used. In the 2011 UDHS, women 15-49 were asked if they knew a place where they could go to be tested and further if they had ever undergone an HIV test and received the results of the test. The data was collected from ten regions of Uganda. Women were grouped adolescent aged 15-19 (n=2,048) and non-adolescent aged 20-49 (n=6,648). Data was weighted to ensure representativeness of the sampled data.

Variables

The dependent variable was HIV testing & receipt of results. The variable had two outcomes: tested and received result or not tested and tested but did not received result. The independent variables include; Place of residence (urban, rural), Education level (no education, primary, post-primary), region (Kampala, Central 1, Central 2, East Central, Eastern, North, Karamoja, West-Nile, Western, Southwest), Religion (Catholics, Protestant, Muslim, Pentecostal, Other), Wealth index (Poorest, Poorer, Middle, Richer, Richest), marital status (Never in union, married, widowed/separated), ever given birth (yes, no), ever had sex (yes, no), comprehensive knowledge on HIV (have comprehensive, did not have comprehensive knowledge) and HIV stigma (have HIV stigmatizing attitudes, did not have HIV stigmatizing attitudes. HIV stigma was generated from five variables namely willingness to take care of a family member with HIV/AIDS, willingness to buy fresh vegetables from HIV positive vender; allowing a HIV positive teacher who is not sick to continue teaching and would not want to keep secret that a family member has HIV/AIDS. On the other hand, Comprehensive knowledge was generated

from variables such as; knowing that consistent use of condom during sexual intercourse and having just one uninfected faithful partner can reduce chance of getting AIDS virus; rejecting misconceptions namely; AIDS can be transmitted by mosquito bite and a person can get infected by sharing food with an infected person.

Statistical analysis

Statistical analysis was undertaken using STATA 12.0 at three levels: First, a descriptive summary indicating differentials in women's characteristics was performed using frequency distribution. Secondly, difference in HIV testing and receipt of results between adolescent and non-adolescent women distributed according to their characteristics was performed using frequency distribution showing percentage difference. Thirdly, Multivariate decomposition model which was used to portion changes between groups into components attributable to changing characteristics and changing effects of characteristics was used to determine variables associated with difference in HIV testing and receipt of results between the two groups. The difference observed in HIV testing and receipt of results was decomposed into components attributable to differences in characteristics between adolescents and non-adolescents (endowments) and group differences in the effects of the characteristics (differences in coefficients). All associations were deemed statistically significant at a cut-off p-value of 0.05.

Results

This section of the paper presents results of the study including percentage distribution of women by characteristics, percentage distribution of women by HIV testing and receipt of results, differences in HIV testing and receipt of results between adolescent and non-adolescent women by characteristics and decomposition of differences in HIV testing and receipt of results.

Distribution of women by characteristics

The characteristics of women assessed in the study were; level of education, place of residence, region, religion, wealth index, marital status, ever given birth, ever had sex, comprehensive knowledge on HIV and HIV stigma. Table 1 presents distribution of adolescent (15-19) and non-adolescent (20-49) women by these characteristics.

From Table 1, notable change in distribution of women by their characteristics was observed in variables; marital status, ever given birth, ever had sex, HIV stigma, comprehensive knowledge, wealth index and education level.

The findings reveal a large difference between adolescent and non-adolescent women in terms of sex history (52.5%). In relation to marital status, notable difference in distribution was observed in women who were never in union (-69.2%) and those who were married or living together with their partners (55.7%). In relation to birth history, the results showed a big difference in ever given birth between adolescents and non-adolescents (73.7%). Results indicated a relatively small difference in distribution of women who had comprehensive knowledge between adolescents and non-adolescents (2.8%). A slight difference was also noted in women with HIV stigmatizing attitudes. In both population groups, the highest proportion of women studied had rural residence. With regard to level of education, the highest proportion of women studied had primary level of education across the two population groups. However a notable difference was observed in women with no education (13.1%).

HIV testing and receipt of results

As earlier on noted, HIV testing and receipt of results was assessed basing on binary outcome which included; tested and received results or never tested, tested and never received results.

In the results according to Figure 1, only 45.5% of adolescent women tested and received HIV results compared to 79.3% of non-adolescent women who tested and received results. This result leaves a very big difference in HIV testing and receipt of results between adolescents and non-adolescent women in Uganda (33.8%) implying that there was low uptake of HIV testing among female adolescents compared to non-adolescent women.

Differentials in HIV testing and receipt of results

Table 2 presents differences in HIV testing and receipt of result between adolescent and non-adolescent women distributed by their characteristics.

HIV testing increased for women with post-primary level of education (53.8% for adolescent and 87.5% in non-adolescents). However, a greater change was notable among women with no education (40.4%). With regard to region, HIV testing increased for women in Northern region

(59.3% in adolescent and 88.6% in non-adolescents). However, high percentage change between adolescents and non-adolescents was recorded in Southwest region (42.4%). In terms of religious affiliation, the lowest change in HIV testing between adolescent and non-adolescents was observed in women who belong to Catholics (29.7%). HIV testing also increased for women in the richest wealth quintile (50.3% in adolescents and 86.7% in non-adolescents). However, a notable change was recorded among women in the richer wealth quintile (38.2%).

In terms of marital status, the highest percentage change in HIV testing was reported in women who were never in union (38.8%). Being widowed/ separated was associated to decrease in HIV testing between adolescents and non-adolescents (-6.5%). Increase in HIV testing has been associated with women who have ever given birth (82% for adolescents and 80.1% for non-adolescents). Increase in HIV testing uptake was also associated with women who have comprehensive knowledge (49.4% for adolescent women and 84.4% for non-adolescent women). There was a high percentage change in HIV testing among women who have comprehensive knowledge (35.0%). Increase in HIV testing uptake was also associated with women who have no stigmatizing attitudes towards people living with HIV/AIDS (57.3% for adolescent women and 85.5% for adolescent women). In terms of life-time sexual partners, notable change in HIV testing uptake between adolescents and non-adolescent was observed in women who had no sexual partners (26.9%).

Decomposition of differences in HIV testing and receipt of results

A multivariate decomposition logistic regression model was used to decompose differences in HIV testing and receipt of results (HTR) between adolescents and non-adolescents women attributed to variation in their characteristics/ endowments (E) and variation in the effects of the predictors/coefficients (C). Tables 3a and 3b present decomposition results of differences in HIV testing and receipt of results between adolescent and non- adolescent women.

According to the results in Table 3a, differences in HIV Testing and Receipt of results between adolescent and non-adolescent women were significantly attributed to both differences in the characteristics and variation effects of predictors of the two groups ($p < 0.05$). Overall, about 57.2% of the gap in HTR can be attributed to differences in characteristics while 42.8% of the

gap in HTR can be attributed to differences in effects of predictors or coefficients between adolescent and non-adolescent women.

Overall, Variation in the characteristics of adolescent and non-adolescent women contributed about 57.2% to the overall change in HIV testing and receipt of results between adolescent and non-adolescent women. Specifically, the differences were significantly attributed to characteristics of women namely; education, place of residence, region, ever given birth, ever had sex, comprehensive knowledge and HIV stigmatizing attitudes ($p < 0.05$). The variation in these characteristics of women contribute about -6.5%, 0.2%, -0.5 31.6%, 34.7%, 0.4% and 0.8% to the overall gap in HIV testing difference in adolescent and non-adolescent women respectively. The positive percentages in the results show the proportion in which the overall gap would reduce if the differences in the characteristics of women in the two groups were to disappear. On the other hand, the negative percentage shows the proportion to which the gap in HIV testing would increase if the differences in the characteristics of women in the two groups were to disappear. The overall gap in HIV testing and receipt of results would reduce by 31.6%, 34.7%, 0.4%, 0.8% and 0.2% if adolescent and non-adolescent women had similar proportion of their population in groups who have; ever given birth, ever had sex, comprehensive knowledge on HIV, HIV stigmatizing attitudes and place of residence respectively.

On the other hand, variation in the effects of characteristics (coefficients) contributed about 42.8% to the overall difference in HIV testing between adolescent and non-adolescent women. Specifically, the differences were significantly attributed to variation in the effects of characteristics of women namely; education and marital status ($p < 0.05$). The variation in the effects of characteristics (coefficients) of women contribute about -68.6% % and -12.6%, to the overall gap in HIV testing change in adolescent and non-adolescent women respectively. In particular, the overall gap in HIV testing between adolescent and non-adolescent women would increase by 68.6% and 12.6% in the absence of variation in the effects of women's education and marital status respectively on HIV testing. 57.2 percent of the gap in the rates can be attributed to differences in the constants of the models for adolescent and non-adolescent women. This suggest that the study variables may be unable to fully explain the gaps in HIV testing and

receipt of results as some behavioral and cultural factors may be difficult to measure due to the nature of the data.

Discussion

This study analyzed data from 2011 UDHS to assess differences in HIV testing and receipt of results between adolescent and non-adolescent women in Uganda. The findings show that differences in HTR can be attributed to both variation in characteristics (endowments) and variation in effects of characteristics (coefficients). In particular, the compositional variation in adolescent and non-adolescent women are noted in characteristics namely ever had sex, ever given birth, comprehensive knowledge on HIV/AIDS, stigmatizing attitudes, level of education and place of residence. Variation in the effect of characteristics (coefficient) also contributed to the changes for example variation in level of education and marital status though in a negative direction significantly contributed to differences in HIV testing and receipt of results between adolescent and non-adolescent women in Uganda. This particular effect contradicts most of the current literature

The characteristics that had major contribution to the overall gap in HIV testing and receipt of results between adolescent and non-adolescent women were ever had sex and ever given birth. Having had sex explains the largest portion of the overall gap in HTR between the two groups. This points out to the issue of variation in perception of risk to HIV/AIDS between adolescent and non-adolescent. Adolescent women tend perceive themselves as not being at high risk due to few exposure to hero-sexual intercourse which causes most of them not seek HIV testing. However this perception put adolescent women even at high risk of acquiring HIV virus in future as they undermine other sources of infections such as Mother-to-Child Transmission and sharing of sharp instruments. Besides, HIV testing has been found to be beneficial in reduction of risky sexual behaviors such as non-condom use, multiple sexual partnering, cross-generational sex, commercial sex and drug use among young persons. These benefits of HIV testing may be missed by adolescent women due to low HIV testing and receipt of results. A study conducted among young people in Nigeria reported that young people who have ever had sex were about 2 times more likely to go for HIV test than their counterpart who had never had sex [3]. This was still confirmed by a study conducted among young women in Tanzania which found that women who have ever had sex were 4.4 times more likely to test for HIV compared to those who have

never had sex [8]. Although unprotected sexual intercourse is considered as a major risk factor to HIV virus, there other ways through which HIV virus can be transmitted such as MTCT and sharing of sharps with HIV positive person. Adolescents being young make them more vulnerable to HIV through these means. Besides, studies have indicated that HIV testing besides helping individuals to know their HIV statuses, serves to reduce unsafe behaviors [15]. This therefore point to the need to scale up HIV testing among adolescent women by increasing on awareness that focuses on clearing misconceptions about HIV among adolescent women.

Related to the above, having given birth was also found to be contributing a large portion to the overall gap in HIV testing and receipt of results between adolescent and non-adolescent women. This can be justified by the fact that majority of non-adolescent women have ever given birth and it is mandatory for couples to test for HIV during antenatal care in Uganda following mass campaigns on Elimination of Mother-to-Child Transmission of HIV (EMTCT). Less than quarter of adolescent women has ever given birth hence reducing the chances of testing for HIV compared to non-adolescent women. This reveals to government and development partners to scale up interventions targeting adolescent women for example in-school HIV testing counseling and testing and other adolescent friendly services.

Change in HIV testing and receipt of results between adolescent and non-adolescent women was also attributed to place of residence indicating that gap in HIV testing would reduce by at least 0.2 percent if this variation is removed. This can partly be attributed to concentration of health facilities in urban centers. This findings is consistent with a study conducted in Tanzania among young women in Tanzania which found out that young women with urban residence were 0.5 times more likely to test and received their HIV result compared to the rural counterparts [3]. This finding directs government and other development partners strengthen health services in rural areas in order to reduce the gap in HIV testing between adolescent and non-adolescent women in Uganda. However, this finding was contrary to studies conducted in Zimbabwe which did not find any significant relationship between place of residence and HIV testing [14].

Variation in level of education was also found in this study to have contribution to the overall gap in HIV testing and receipt of results between adolescent and non-adolescent women which is consistent with findings from a study conducted in Nigeria which revealed that young people

with at least a secondary education are about 1.6 times more likely to access HCT than their counterpart with primary education or no education at all [3]. This finding was also confirmed by findings from a study conducted in Tanzania which found that young women with secondary level of education were 5.5 times more likely to test and received their HIV result compared to those with no education [8].

Conclusion

The findings of this study provide evidences about differences in HIV testing and receipt of results between adolescent and non-adolescent women. The differences are attributed to both variation in characteristics (endowments) and variation in the effects of predictors (coefficients). However, currents variables leaves about slightly more than half of the differences unaccounted for as some behavioral and cultural factors may have not been considered. Further investigation into the effects of these factors would go a long way in providing more insight on difference in HIV testing and receipt of results between the two groups.

Lists of abbreviations

AIDS: Acquired Immune-Deficiency Syndrome; ART: Anti-retroviral therapy; HCT: HIV Counseling and Testing; HIV: Human Immune Virus; HTR: HIV testing and receipt of Results; MoH: Ministry of Health; PMTCT: Prevention of Mother to Child Transmission; UBOS: Uganda Bureau of Statistics; UDHS: Uganda Demographic Health Survey; UNAIDS: Joint United Nation Program on HIV/AIDS; UNFPA: United Nation Fund for Population Activities; VCT: Voluntary Counseling and Testing; WHO: World Health Organization

Declarations

Ethics approval and consent to participate

Ethical approval for study was not required because the data secondary and available the in public domain. Permission to download and analyze UDHS was granted by Measure DHS program/ ICF International.

Competing interest

The authors declare that they have no competing interest.

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Consent for publication

Not applicable

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