Determinants of Access to HIV Testing among Older Persons in Rural Uganda: A Cross-Sectional Study

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Abstract

Background: There is limited evidence on access to HIV Testing among older persons in rural Uganda. The aim of this study was to investigate the determinants of access to HIV testing among older persons in rural Uganda.

Methods: A survey of 649 older persons was conducted in Hoima and Masaka districts of Uganda. Binary logistic regression of HIV testing and selected explanatory variables were conducted.

Results: Over three quarters (83%) and slightly over half (55%) reported lifetime and recent HIV testing. Reduced stigma / caring for an AIDS patient, younger age and being female gender were positively associated with HIV testing among older persons in rural Uganda.

Conclusion: Age and gender disparities are critical determinants of access to HIV testing among older persons in Uganda. Interventions to improve HIV testing coverage among older persons should target the oldest old, and older men.

Keywords: HIV, AIDS, Testing, VCT, aged, Africa

Background

Uganda is experiencing a demographic and epidemiological transition, just like other developing countries. The demographic transition which is associated with improvement in life expectancy has led to the ageing of populations and the hence the rise in the proportion of older persons (age 50 and older). The older population accounts for about 5% of the population (now at 34 millions) according to the recent Uganda Population and Housing Census (UBOS, 2014). Older persons have unique health and healthcare challenges (Wandera, Kwagala, & Ntozi, 2015). These include NCDs, sexually transmitted infections including HIV.

The epidemiological transition is associated with alterations in the burden of disease (BOD) in several countries. There is a double DOB in Uganda's adult population characterized by the onset of non-communicable and the prevailing communicable diseases including HIV and AIDS (Kuteesa et al., 2014; Nyirenda et al., 2013). The double burden of disease is more pronounced among older people in Uganda (Wandera, Golaz, Kwagala, & Ntozi, 2015).

HIV in old age is an emerging public health challenge. Globally, one in ten (11%) adults age 50 and older, are infected with HIV. Projections indicate that the number of those living with HIV will continue to rise in the coming decades[7]. HIV in old age has two major pathways: first, ageing with HIV and second, infections in old age (Scholten et al., 2011). Unfortunately, there are is limited data on HIV among older persons. Most of the health surveys (including Demographic and Health Surveys and AIDS Indicator Surveys) on HIV and AIDS focus on populations age 15-54. The recent Population and HIV Impact Surveys (PHIA) in 12 African countries and Haiti partially address this gap.

Aging with HIV in Africa is quite challenging. Old age is associated with an increase in the burden of non-communicable diseases (NCDs). HIV infection exacerbates the early onset of NCDs and therefore requires integrated care and treatment responses[12]. Additionally, chronic conditions (e.g. hypertension, diabetes) associated with aging require treatment with medications, augmenting the likelihood of drug-drug interactions with ART and therefore, adverse drug reactions[13]. In sub-Saharan Africa, older PLWH often face financial and psychosocial responsibility of raising grandchildren orphaned by HIV [15], which may compromise engagement and retention in HIV care. Lastly, when compared to younger patients, older patients are usually diagnosed at an advanced stage of HIV[16].

Several studies on the health of older people in Uganda have focused on later life problems associated with HIV/AIDS but not with access to HIV Testing Services (HTS). Specifically, such studies have concentrated on the consequences of HIV/AIDS such as care giving roles towards orphans, and social support dynamics (Scholten et al., 2011; Seeley, Wolff, Kabunga, Tumwekwase, & Grosskurth, 2009). In addition, older persons are not given priority in the HIV testing programming and healthcare provision. Several assumptions merit illumination: first, is that older persons are assumed to be sexually inactive and therefore might not need sexual and reproductive health (SRH) services. Yet there is substantial evidence that older people remain sexually active past the age of 50 and older [11]. Thus, there is need to integrate sexual activity amongst older persons in HIV prevention services[10].

Second, it is assumed that older persons are not vulnerable to HIV infections compared to younger people. Unfortunately, older women are vulnerable to sexual abuse and the risk of HIV infection. In addition, even older persons in general are vulnerable to HIV infections. There is also stigma about accessing HIV testing services for older persons in particular (Ferreira, 2006; MRC & UVRI, 2011).

Consequently, there is limited evidence on access to HIV Testing Services (HTS) among older persons in Uganda (Kuteesa et al., 2014; Nyirenda et al., 2013). Therefore, the aim of this study was to investigate the determinants of access to HIV testing services among older persons in selected rural districts in Uganda. Specific objectives include:

Methods

Sampling procedures

The study used a cross-sectional study design and employed a two-stage stratified cluster sampling design. Due to financial limitations, two regions were randomly selected: central and western regions. From each region, simple random sampling was used to select one district: Masaka (central) and Hoima (western) districts. From the districts, two sub-counties from Masaka and three sub-counties from Hoima were selected using simple random sampling. Masaka has 9 sub-counties namely: Bukakata, Buwunga, Kabonera, Katwe/Butego, Kimanya/Kyabakuza, Kkingo, Kyanamukaaka, Mukungwe, and

Nyendo/Senyange, with a total of 399 villages[1]. Hoima has 13 sub-counties and 653 enumeration areas. The sub-counties include: Bugambe, Buhanika, Buhimba, Buseruka, Busiisi, Hoima TC, Kabwoya, Kigorobya, Kigorobya TC, Kitoba, Kiziranfumbi, Kyabigambire, and Kyangwali[2].

From each sub-county, 4 enumeration areas or villages will be selected using systematic sampling. From each village, in consultation with local leaders, a sampling frame of older persons' and their households will be constructed and systematic sampling will be applied to select participants for the survey. In households where older men and women live as couples, both of them will be interviewed separately.

Kish's formula was applied to generate a sample size of 660 older persons. According to the Uganda AIDS Indicator Survey (2011), the prevalence of HIV testing for those age 50-59 years was 45% (men) and 49% (women). Using the lower bound of HIV testing (45%), the p=0.45 and the q=0.55. The level of confidence is 95% (z=1.96) and the error is set at 8% (e=0.008). The sample size is 148.5. The sample size is multiplied by the design effect, (D=2, which is always taken as a 2 if information is not available from other studies). Therefore, the sample size is 297. The final sample size after adjusting for a response rate of 90% becomes 330. To allow for small area (district) estimations, the sample size is multiplied by 2 since the study covers two districts. The overall, sample size is 660 older persons.

The formula used to generate the sample size is shown below:

$n = \left(\left(\frac{z^2 * p * q}{e^2} \right) * D \middle| R \right)$ Where: *z is confidence level (95%), p=proportion of older people who tested for HIV (45%), q=1-p, D = design effect (2), R = response rate (90%).*

The number of older persons to be selected from each enumeration area was determined by probability proportionate sampling (PPS) from the 2014 Uganda census sampling frame. Systematic sampling was used to finally select older persons for interviews in the survey.

[1] http://www.lcmt.org/uganda/masaka

[2] http://www.lcmt.org/uganda/hoima

Study design and data collection methods

We conducted a survey among older people covering 2 districts of Uganda (Hoima and Masaka) following a target of 660 older persons. Due to non-response, we achieved a sample size of 649 older persons. These two districts were purposively selected: Hoima was selected because it was one of the districts considered during the doctoral studies and also has an active association for older people, which could influence their behaviour. Masaka was selected because of the past high HIV prevalence. A pilot study / pre-testing of the tools was conducted in Wakiso district.

Inclusion and exclusion criteria:

The inclusion of participants in the survey was based on their age (50 years and older) and mental health status. Older persons who are able to speak and understand (good mental status) were recruited. Those who were not mentally capable to express themselves were excluded from the study.

Data collection methods and tools:

Tools for data collection will included the survey questionnaire – Appendix 1.

Ethical considerations

Ethical approval (SS 4424) was obtained from the Uganda National Council of Science and Technology (UNCST). The study protocol was submitted to "The AIDS Support Organization (TASO) Research and Ethics Committee (TASO-REC/30/17/UG-REC-009) before submission to the UNCST.

Participation in the study was on voluntary basis. Thus, voluntary informed consent was obtained from all participants. Participants were informed of their freedom first to choose to participate in the study, and if they choose to, freedom to withdraw at any point or not to respond to questions that they do not wish to without negative consequences. Participants were assured of confidentiality.

Data analysis

Data collection was done using Survey CTO on electronic Tablets. Collected interviews were downloaded from the Survey CTO Server as STATA files. Binary logistic regression of HIV

testing and selected explanatory variables were conducted.

Results (Preliminary)

Prevalence of HIV testing

Over three quarters (83%) and slightly over half (55%) reported lifetime and recent HIV testing.

Factors associated with HIV Testing

Tables 1 and 2 indicate that reduced stigma / caring for an AIDS patient, younger age and being female gender were positively associated with HIV testing among older persons in rural Uganda.

Authors contributions

The research team was composed of two members of the Department of Population Studies, Makerere University. Stephen Ojiambo Wandera (SOW) was the Principal Investigator (PI). The Co-PIs were Dr. Betty Kwagala (BK), Dr. Cyprian Misinde (CM) and Fred Maniragaba (FM). Research assistants (RAs) were recruited to support the data collection exercise.

References

1. UNAIDS. AIDS by the numbers. *AIDS by Numbers 2015*. 2015:1-11. doi:JC2571/1/E.

2. UNAIDS. Global AIDS Update 2016. *Jt United Nations Program HIV/AIDS*. 2016:1-16. doi:http://www.unaids.org/sites/default/files/media_asset/global-AIDS-update-2016_en.pdf.

3. World Health Organization, Unicef, Unaids. GLOBAL UPDATE ON HIV TREATMENT 2013 : Results, Impact and Opportunities. *Glob Updat HIV Treat 2013 results, impact Oppor*. 2013;(June):7. doi:ISBN 978 92 4 150573 4.

4. Nakagawa F, May M, Phillips A. Life expectancy living with HIV: Recent estimates and future implications. *Curr Opin Infect Dis*. 2013;26(1):17-25. doi:10.1097/QCO.0b013e32835ba6b1.

5. UNAIDS. The Gap Report. *Geneva: UNAIDS*. 2014. doi:ISBN 978-92-9253-062-4.

6. Costagliola D. Demographics of HIV and aging. *Curr Opin HIV AIDS*. 2014;9(4):294-301. doi:10.1097/COH.0000000000000076.

7. Hontelez JAC, de Vlas SJ, Baltussen R, et al. The impact of antiretroviral treatment on the age composition of the HIV epidemic in sub-Saharan Africa. *AIDS*. 2012;26 Suppl 1(November 2011):S19-30. doi:10.1097/QAD.0b013e3283558526.

8. Mills EJ, Bakanda C, Birungi J, et al. Life expectancy of persons receiving combination antiretroviral therapy in low-income countries: A cohort analysis from Uganda. *Ann Intern Med*. 2011;155(4):209-217. doi:10.7326/0003-4819-155-4-201108160-00358.

9. Mills EJ, Bakanda C, Birungi J, et al. Mortality by baseline CD4 cell count among HIV patients initiating antiretroviral therapy: evidence from a large cohort in Uganda. *AIDS*. 2011;25(6):851-855. doi:10.1097/QAD.0b013e32834564e9.

10. Negin J, Nemser B, Cumming R, Lelerai E, Amor Y Ben, Pronyk P. HIV attitudes, awareness and testing among older adults in Africa. *AIDS Behav*. 2012;16(1):63-68. doi:10.1007/s10461-011-9994-y.

11. Freeman E, Anglewicz P. HIV prevalence and sexual behaviour at older ages in rural Malawi. *Int J STD AIDS*. 2012;23(7):490-496. doi:10.1258/ijsa.2011.011340.

12. Dalal S, Beunza JJ, Volmink J, et al. NON-COMMUNICABLE DISEASES Non-communicable diseases in sub-Saharan Africa: what we know now. *Int J Epidemiol*. 2011;40:885-901. doi:10.1093/ije/dyr050.

13. Eduardo E, Lamb MR, Kandula S, et al. Characteristics and outcomes among older HIV-positive adults enrolled in HIV programs in four sub-Saharan African countries. *PLoS One*. 2014;9(7). doi:10.1371/journal.pone.0103864.

14. Tuboi SH, Pacheco AG, Harrison LH, et al. Mortality associated with discordant responses to antiretroviral therapy in resource-constrained settings. *J Acquir Immune Defic Syndr*. 2010;53(1):70-77. doi:10.1097/QAI.0b013e3181c22d19.

15. Kautz T, Bendavid E, Bhattacharya J, Miller G. AIDS and declining support for dependent elderly people in Africa: Retrospective analysis using demographic and health surveys. *BMJ*. 2010;341(7764):136. doi:10.1136/bmj.c2841.

16. Mensforth S, Goodall L, Bodasing N, Coultas J. Late diagnosis among our ageing HIV population: a cohort study. *J Int AIDS Soc*. 2014;17(4 Suppl 3):19692. doi:10.7448/ias.17.4.19692.

Tables

Table 1 Adjusted incidence risk ratios for regression for lifetime HIV testing among older people in Uganda

	Model (1)		Model (2)		Model (3)	
Characteristics	RR	95% CI	RR	95% CI	RR	95% CI
Age						
50 – 59	1.76***	1.28-2.42	1.71**	1.24-2.36	1.70**	1.23-2.34
60 – 69	1.68**	1.22-2.32	1.64**	1.18-2.27	1.64**	1.19-2.27
70 – 79	1.47*	1.05-2.08	1.44*	1.02-2.04	1.44*	1.02-2.03
80+	1		1		1	
Education level						
None	1		1		1	
Primary	1.04	0.90-1.20	1.01	0.88-1.17	1.02	0.88-1.18
Secondary +	1.12	0.97-1.30	1.07	0.93-1.24	1.09	0.94-1.26
Marital status						
Not married	1		1		1	
Married	1.03	0.91-1.16	1.02	0.91-1.14	1.02	0.91-1.15
Worked for pay in the last 12 months						
No	1		1		1	
Yes	0.94	0.87-1.01	0.94	0.88-1.01	0.94	0.87-1.01
Religion						
Catholic	1		1		1	
Anglican	0.94	0.86-1.02	0.94	0.86-1.03	0.94	0.86-1.02
Muslim	0.96	0.87-1.06	0.97	0.88-1.07	0.97	0.88-1.07
Others	1.01	0.90-1.12	1.02	0.92-1.13	1.02	0.92-1.14
Number of sexual partners						
1	1		1		1	
2 and above	1.02	0.94-1.10	1.02	0.94-1.10	1.02	0.94-1.10
Number of children						
<5	1		1		1	
5 and above	1.06	0.95-1.18	1.06	0.95-1.18	1.05	0.94-1.17
Has sufficient HIV knowledge						
No			1		1	
Yes			1.04	0.96-1.14	1.05	0.96-1.15
Ever taken care of an HIV patient						
No			1		1	
Yes			1.07	0.98-1.18	1.07	0.97-1.17
HIV/AIDS patients stigmatized						
No					1	
Yes					1.07	0.99-1.15
Had STIs						
No					1	
Yes					1.02	0.94-1.10
Observation	387		387		387	

Exponentiated coefficients; 95% confidence intervals in brackets * p < 0.05, ** p < 0.01, *** p < 0.001

Table 2 Adjusted odds ratios from complementary log-log regression of HIV testing in the last 12 Months s among older people in Uganda

	Men		Women		All	
Characteristics	OR	95% CI	OR	95% CI	OR	95% CI
Age						
50 – 59	**5.75***	2.01 – 16.43	**4.99***	1.70 – 14.68	**5.42***	2.62 – 11.21
60 – 69	**3.90***	1.35 – 11.30	**3.23***	1.09 – 9.60	**3.68***	1.75 – 7.73
70 – 79	**3.81***	1.22 – 11.86	1.87	0.58 – 6.00	**2.78***	1.26 – 6.11
80+	1		1		1	
Education level						
None	1		1		1	
Primary	0.94	0.42 – 2.08	1.13	0.60 – 2.11	1.05	0.65 – 1.69
Secondary +	0.74	0.30 – 1.83	0.95	0.44 – 2.09	0.83	0.48 – 1.44
Marital status						
Not married	1		1		1	
Married	0.93	0.51 – 1.69	1.44	0.88 – 2.36	1.26	0.89 – 1.78
Worked for pay in the last 12 months						
No	1		1		1	
Yes	**1.94***	1.14 – 3.30	1.21	0.75 – 1.96	**1.53***	1.09 – 2.14
Religion						
Catholic	1		1		1	
Anglican	0.92	0.51 – 1.64	1.06	0.59 – 1.88	1.00	0.68 – 1.49
Muslim	**3.01***	1.45 – 6.25	0.90	0.44 – 1.86	1.59	0.96 – 2.62
Others	**3.41***	1.25 – 9.30	0.71	0.32 – 1.59	1.41	0.78 – 2.55
Has sufficient HIV knowledge						
No	1		1		1	
Yes	1.15	0.68 – 1.94	1.64	0.98 – 2.75	1.34	0.94 – 1.92
Ever taken care of an HIV patient						
No	1		1		1	
Yes	1.69	0.94 – 3.03	**2.94***	1.74 – 4.97	**2.16***	1.49 – 3.15
Had STIs						
No	1		1		1	
Yes	1.73	0.99 – 3.03	1.09	0.64 – 1.86	1.39	0.95 – 2.04

OR = Odds Ratio - CI = Confidence Intervals - *p<0.05