Role of Support Persons in Adolescent and Young Adult Voluntary HIV Testing and Counseling in Kenya

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A thesis

submitted in partial fulfillment of the

requirements for the degree of

Master of Public Health

University of Washington

2016

Committee:
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Program Authorized to offer Degree:
Epidemiology

University of Washington

Abstract

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Background: Adolescents and young adults (AYA) are the only age stratum in which HIV incidence and mortality are increasing. A quarter of AYA aged 15-24 in Kenya have been tested for HIV. Understanding how AYA leverage parent, partner, and peer support when testing for HIV can inform policies and programs aimed at improving the uptake and quality of AYA testing.

Methods: AYA aged 14-24 who completed voluntary HIV testing and counseling (VCT) at a large urban referral hospital in Nairobi, Kenya completed a post-test, anonymous audio computer assisted self-interview (ACASI) survey. Questions assessed the role of parent, partner and peer support people (SP) in the AYA's decision to test and the role they played in the AYA's testing visit. SP were compared between AYA grouped by age (young: 14-19y vs older 20-24y), and cofactors for testing with SP were determined using relative risk regression.

Results: Among 227 AYA assessed between October and December 2015, median age was 21 (IQR: 19-23). More than half of AYA presented with a SP (6.2% with a parent, 9.3% with a

partner, 35.0% with a peer, 2.7% with others, and 2.1% with multiple types of support persons), and SP participated in all aspects of the testing visit.

It was more common for older AYA to present alone (49.1% vs 30.2%, p=0.011) and less common to present with a parent (1.2% vs 19.1%, p<0.001) when compared to younger AYA. Similar proportions of younger and older AYA came with a peer, partner, or in a group (p>0.05 for all comparisons). Younger AYA were more likely than older AYA to be influenced in their decision to test for HIV by parents (22.2% vs 6.1%, p<0.001) (Figure 1).

Using age as a continuous variable, older AYA were less likely to come to the VCT with a support person when compared to younger AYA (RR: 0.91 [95%CI: 0.85-0.98]). After controlling for age and previous HIV testing, peer-accompanied AYA were less likely to have correct HIV prevention knowledge (aRR: 0.50 [95%CI: 0.28-0.91] p=0.022) than those who came alone. Accompanied and unaccompanied AYA had similar knowledge regarding HIV transmission (P>0.05), and similar proportions had previously sought family planning services and had been tested for STI (p>0.05).

Conclusion: Parent, partner, and peer SP play an important role in Kenyan AYA's decision to seek HIV testing, and during the test visit itself. Young AYA leverage parental support while older AYA are more likely to come to the VCT unaccompanied. Defining the role of SP in the HIV testing visit and AYA care-seeking behaviors can inform strategies that leverage this support to enhance AYA HIV testing and care.

Introduction

HIV/AIDS is the leading cause of death among adolescents or young adults (AYA) in Africa.[1] UNAIDS reports a 50% increase in HIV-related mortality among AYA in Africa from 2005 to 2012, while there was a 30% decrease in HIV-related mortality in Africa's entire population.[2] According to the World Health Organization, there are more than 250,000 AYA living with HIV, which comprises 16% of Kenyans living with HIV/AIDS.[3] AYA aged 15-24 have the highest HIV incidence rates compared to other age strata.[4] As a transition period, adolescence introduces many biological and psychological changes. AYA experience puberty, sexual debut, and increasing independence.[3, 5] Primary barriers for HIV testing in this age group include a greater need for privacy, specifically for stigmatized issues such as sex and HIV, but also continued reliance on parents for transport funds and consent.[6]

Accessing HIV testing and counseling (HTC) can be challenging for AYA. Support people (SP), specifically parents, partners, and peers who are present during patient medical visits currently play an important role in many HIV treatment programs; SP have been utilized in HIV programs as "treatment buddies" to improve adherence to antiretroviral treatment (ART),[7, 8] to increase knowledge of sex and HIV,[9, 10] and to support lifestyle changes (nutrition, exercise, etc.).[11-14]

Studies have found that SP can mitigate social stigma and discrimination of HIV testing and receiving a positive HIV result.[15, 16] A qualitative research study revealed that AYA are more likely to present to clinic for sexual and reproductive health services (SRHS) with SP due to fear of stigma of sexual promiscuity.[15] Compared to youth tested for HIV, untested AYA were twice as likely to report fears of testing consequences, such as fear about family or partner rejection.[17] SP support can also influence an AYA to test for HIV.[16]

Previous literature has identified varying roles of specific types of SP as barriers or facilitators to AYA HTC. Peer recruiters have the potential to increase acceptability and demand for HTC.[16, 18] Additionally, prior discourse with parents about HIV/AIDS is positively correlated with AYA testing.[16] Partner involvement in testing has been essential to increase HTC uptake among adults. A U.S. study also found that HIV-related partner communication is associated with AYA HTC.[19] AYA may present for HIV testing with a support person, but the role of the SP in the decision to test for HIV and during the testing visit is largely undefined. In 1998, the Horizon Program reported that 36% of 105 AYA aged 14-21 were unaccompanied when presenting for an HIV test, and that AYA were likely to be accompanied by peers.[20]

The HIV epidemic is evolving rapidly in Sub-Saharan Africa and necessitates a current, thorough characterization of SP accompanying AYA to the clinic for testing. There is evidence that SP may influence AYAs' time of sexual debut and HIV-positive AYAs' linkage to an HIV treatment program.[8, 21, 22] The Kenya AIDS Indicator Survey estimates that only a quarter of HIV-positive AYA are aware of their HIV status in Kenya.[4] Improving upon current AYA HIV testing experiences could foster increased AYA awareness of their HIV status.

Defining the role of SP in AYA care-seeking behaviors and the HIV testing visit can inform strategies that leverage this support to enhance AYA HIV testing and care. We aim to define the role SP play in the HIV test visit, to characterize SP involvement in decision to test for HIV, to determine cofactors for SP attendance, and to compare reproductive health knowledge and care-seeking between AYA presenting with and without an SP.

Methods

This study is a cross-sectional, secondary analysis evaluating the role of SP in AYA HIV testing. The primary study, *Developing Adolescent Strategies for HIV Testing (DASH)*, used continuous quality improvement (CQI) methodology to improve the quality of AYA HIV testing procedures. Baseline survey data collected during the 1.5 months prior to CQI implementation will be used in this secondary analysis on the role of SP in AYA testing.

Recruitment was conducted at Kenyatta National Hospital's HIV Voluntary Counseling and Testing (VCT) clinics in Nairobi, Kenya. There are three sites at Kenyatta National Hospital (KNH) where AYA can be tested for HIV: Upstairs VCT, Youth Center, and Tent VCT. While all 3 clinics serve AYA, Youth Center receives the highest volume of AYA. The Tent VCT is set up outside the hospital to encourage passersby to test and to decrease wait times. The Tent VCT is viewed as more easily accessible to AYA, as patients do not have to state their purpose for visiting the clinic when they enter the hospital main building—they do not have to tell an adult authority figure (a security guard) that they are seeking an HIV test.

We used data from 227 AYA surveyed during the baseline period before the CQI intervention began. AYA aged 14 to 24 who completed HIV counseling and testing services at KNH VCT clinics were invited to participate in the study and were asked to complete an Audio Computer-Assisted Self-Interview (ACASI) survey. All AYA presenting for HIV testing services were asked to complete a survey. Those who were not aged 14-24 and were not proficient in English were excluded from the study.

Data were collected using ACASI surveys. Because schoolchildren receive extensive English language instruction in Kenya, the ACASI survey was conducted in English. To enable participation by AYA with incomplete literacy, participants could also elect to tap a button on the

screen, which read the question and numbered answers aloud; noise-cancelling headphones were provided to improve audio quality and maintain privacy. A study counselor was also available to answer any questions.

Potential subjects were recruited by VCT staff after completing the HIV testing and counseling session and referred to study staff. Interested and eligible participants were told about the study and asked to provide oral consent for participation. Participants then completed the ACASI survey.

Open Data Kit (ODK), an open-source tool developed by researchers at the University of Washington, was used to generate questionnaires.[23] The ODK platform was built to maximize data quality: it has built-in checks, field limits, skip patterns and required questions. Initial codebooks underwent several review processes and the tool was piloted before study initiation.

Aim 1: Describing SP and their role in AYA HIV testing

Proportions were used to describe the role of SP in AYA HIV testing. We determined the proportion of AYA self-reporting that their decision to test was influenced by SP and the types of SP influencing AYA decision to test for HIV (Table 2). We specifically looked at those who reported parents, peers, partners, health care workers (HCW), counselor, and/or those who reported other support persons (which included those who indicated other support persons or who specified being influenced to test by other family members and/or by church members). AYA could indicate multiple SP who influenced their decision to test. If an AYA selected multiple SP, that AYA was included in the numerator of each of the proportions of the SP that they indicated.

A test of binomial proportions was used to determine whether AYA are more likely to present for HIV VCT accompanied by a support person or unaccompanied (Table 3). We reported the proportion of AYA who came with SP, those who came with parent(s), peer(s), and partner(s),

those who selected multiple groups (e.g. parent and peer), and those who came with others, which AYA who selected other family, church members, or other. We stratified by age to describe patterns of SP attendance by age: we anticipated younger children would be more likely to be accompanied by a parent, while older youth are more likely to be accompanied by a peer or partner; Chi-squared tests were used to compare proportions of AYA are and are not presenting with SP between different age intervals (14-19 and 20-24). We additionally conducted an analysis to determine if there is heterogeneity among the three sites. We did not find that the populations visiting the three clinics are meaningfully different (there was no evidence of effect modification by clinic site after looking at the directionality and magnitude of the point estimates).

We also determined the proportion of SP actively participating in the HIV test process (pre-test counseling, finger prick/blood draw, disclosure of results, post-test counseling), and the proportion who remained in the waiting room during the visit and did not participate in the testing process (Table 4).

Aim 2: Factors associated with SP accompaniment

Relative risk regression models were used to evaluate the association between exposures and the primary outcome (accompanied/not accompanied). Exploratory analyses were conducted using groups stratified by age interval to test for effect modification between these exposures and outcomes; we did not observe any differences in point estimates. We adjusted for age as a continuous variable when comparing males and females. Highest level of education was collinear with age and first HIV test, thus we only adjusted for age in this analysis.

In our analysis, we also tested for collinearity between exposures likely to be collinear (e.g. age and first HIV test, age and highest level of education). We tested for collinearity between paired variables by computing variance inflation factors. Because we do not want the standard

error to be inflated more than twice its normal size due to collinearity, if the variance inflation factor exceeded 4, the variable was removed from the model. We found that age and highest level of education were collinear.

Global tests of proportions were additionally used to assess differences between the exposures and those who reported coming to the VCT with a peer, partner, or parent, with those who reported coming alone. Exposures included in this analysis are age (14-19/20-24 and linear continuous), sex (male/female), level of education (binary currently in school/not in school and linear continuous), first time presenting for HIV test (yes/no).

Aim 3: SP, HIV knowledge, and prior care-seeking of SRHS

Relative risk regression was used to test for association between SP support and knowledge of prevention and transmission and previous care-seeking of SRHS services, specifically family planning (FP) and testing for sexually transmitted infections (STI). Knowledge questions were identified through checkboxes. Those who checked all the correct options and none of the incorrect options were considered to have "*correct knowledge*" for HIV transmission or prevention variables. E.g. ***Correct transmission knowledge*** was defined as responding that HIV can be transmitted through mother-to-child transmission during pregnancy, delivery and/or breastfeeding and unprotected sex and <u>not</u> including deep kissing, mosquito bites, and sharing a meal with someone who is infected. ***Correct prevention knowledge*** was defined as those who responded that using condoms, having sex with one faithful, uninfected partner, and not having sex as being appropriate prevention methods and did <u>not</u> identify withdrawal of penis before climax and showering after sex as HIV prevention methods. Ever previously sought FP services and ever previously sought STI services were binary yes/no variables. We adjusted for age as a continuous

linear term. Highest level of education was collinear with age, and thus only age was adjusted for in analyses.

The phrase "deep kissing" was confusing to many AYA surveyed and some staff, thus conducted an analysis excluding this question when scoring the *Correct transmission knowledge variable.* This sensitivity analysis did not reveal any significant changes to the relationship between SP and AYA knowledge of transmission of HIV.

Relative regression models were additionally used to assess associations between those who reported coming to the VCT with a peer, partner, or parent, with those who reported coming alone as the referent group and correct HIV prevention and transmission knowledge and previous care-seeking of family planning services and STI testing. After testing for collinearity between age and first HIV test, we found that these were not collinear.

Study power:

Minimum detectable mean differences

Continuous covariates	**Minimum mean detectable difference between AYA with and without SP, 80% power**	**Standard deviation**
Age, years of education	1.00	3.0
Age, years of education	1.65	5.0

Assuming a null hypothesis that AYA are equally likely to come alone and come with someone (probability of support person coming is 0.5), we can reject the null hypothesis if there is a difference $\pm$6% or more AYA using a one sample test of binomial proportions (*Aim 1).*

Minimum detectable difference in proportions and RR

Proportion among AYA in referent (alone) category	**Minimum difference in proportions at 80% power**	**Minimum RR at 80% power**
0.90	0.08	1.09
0.70	0.13	1.20
0.50	0.16	1.32
0.30	0.16	1.53

Assuming an equal standard deviation in those who come with someone or come alone, for continuous variables, such as age

and years of education, we have 80% power to detect minimum mean differences reported in Table 1 (*Aim 2&3*).

Table 2 shows the difference in proportions and relative risks for comparison of proportions for binary variables, including: sex, knowledge, care-seeking of SRHS (*Aims 2&3*).

Results

Participant characteristics

Among 227 AYA, median age was 21 (IQR: 19, 23), 63 (27.8%) were ages 14-19 and 164 (72.3%) were ages 20-24 (Table 1). Fifty-six percent of AYA presented to clinic accompanied by a SP. AYA in this sample tended to be highly educated relative to the Kenyan population, as 95.1% of participants completed secondary school and 74% of participants completed polytechnic school or university/college. There were approximately equal proportions of males and females. Two thirds of participants visited this clinic for the first time and one third of participants received their first HIV test. Of those who were sampled, 48.9% were tested at the Youth Centre at KNH and 80% indicated that their primary reason for coming to the VCT today was to receive an HIV test. 49.8% of AYA had correct HIV prevention knowledge, while 24.7% had correct knowledge of HIV transmission. A quarter of AYA had previously visited a clinic for STI testing and half reported knowing where to access STI testing. Eight percent had ever gone to a clinic for family planning.

Role of SP in decision to test for HIV

Most AYA (67.4%) reported being influenced to test for HIV by a SP. AYA aged 14-19 were more likely than AYA aged 20-24 to be influenced to test for HIV by parents (22.2% vs 6.1%, $p<0.001$) (Figure 1A). A higher proportion of younger AYA were influenced to test by health care workers (34.9% vs 7.9%) and counselors (12.7% vs 9.1%) compared to older AYA. Over a quarter (27.8%) of AYA were influenced to test by a peer; there were no differences between younger (14-19y) and older (20-24y) AYA.

Support persons accompanying AYA to clinic for testing

In unadjusted, stratified analyses, among younger AYA, 19.1% presented with a parent, 30.2% came alone, 34.9% came with a peer and fewer than 7.9% came with a partner, in a group, or with another support person. It was more common for older AYA to present alone (49.1% vs 30.2%, p=0.011) and less common to present with a parent (19.1% vs 1.2%, p<0.001) compared to younger AYA. Younger and older AYA were comparably as likely to present with a peer, with a partner, or in a group, (p>0.05 for all comparisons) (Figure 1B).

Role of SP in test experience

Among the 127 AYA who were accompanied to the VCT by a support person, 16.5% waited in the waiting room for AYA to complete testing, 16.5% were present for pre-test counseling, 29.9% were present for the finger prick/blood draw, 6.3% were present for disclosure of results, and 30.7% were present for post-test counseling (Figure 1C).

Peers were generally involved in pre-test counseling and the blood draw/finger prick compared to parents and partners, but were seldom involved in disclosure of results. Of parents who accompanied the AYA to the clinic, 28.6% waited in the waiting room while the AYA were tested. Parents, however, tended to be involved in the disclosure of results. Only 4.8% of partners were not involved in test experience. Over a quarter of partners were present for the finger prick/blood draw and over half were present for post-test counseling.

Cofactors for presenting with SP

Cofactors for coming to VCT with a support person are shown in Table 1. In univariate analyses, younger age was associated with presenting with a support person (add estimate, CI). Older AYA are less likely to be accompanied to the VCT by SP (RR: 0.91 [95% CI: 0.85-0.98], p=0.012; p<0.05 for all comparisons]).

Knowledge of HIV prevention and transmission in AYA presenting alone or with support

After controlling for age and whether the AYA had tested for HIV in the past, AYA who were accompanied by a peer were less likely to have correct knowledge of HIV prevention (aRR: 0.50 [95% CI: 0.28, 0.91] p=0.022). AYA who were accompanied did not differ from AYA who came alone in their HIV transmission knowledge or history of seeking FP services and STI screening (p>0.05).

Discussion

Most AYA in this study presented for HIV testing with a support person, and support people participated in diverse aspects in the HIV test visit, including pre-test counseling, sample collection, provision of results, and post-test counseling. Our findings revealed age-specific differences in SP accompanying AYA to the clinic for testing and influencing their decision to test for HIV. HIV prevention knowledge was lower in AYA accompanied by peers, suggesting less informed teens may rely on peers for social support when accessing HIV services. AYA with less prevention knowledge may seek support from peers because they may lack other types of support. Our data suggest support persons currently play an important role in AYA HIV testing, and may be an under-utilized resource to promote AYA-friendly HIV testing in Africa.

Many reports have noted the importance of family and peer influence in AYA decision making around reproductive health services and HIV testing.[16, 24] In our study, authoritative figures, such as parents, health care workers, and counselors were more likely to have informed the decision to test for HIV in younger AYA compared to older AYA. Our study did not assess whether AYA or SP were the primary agents who desired the HIV test; in our formative studies, healthcare workers cited conflicting parent/AYA desires for testing to be challenge in their work, and it is possible that a proportion of the younger AYA had been brought by parents wishing to know their status. Our study did not discriminate these reasons for seeking a test, but programs and counseling procedures should account for the possibility for conflicting child/parent wishes, and seek to balance the need for AYA autonomy and confidentiality while still providing critical health information and treatment.

Older AYA were primarily influenced by peers to test, and large proportions were accompanied by peers or partners. Partner testing was common at the older end of the AYA age

range. Group testing is also common in the clinic, where many students will present together for a test after school, test separately, then go their separate ways. This suggests school-based educational materials may be effective in motivating AYA to access sexual and reproductive health care services.

We found that more than half of AYA presented with some type of support person, with younger AYA presenting primarily with parents, and older youth presenting with peers or partners. Surprisingly, in all groups, SPs played active roles across the testing visit. Many participants reported that SP were present during the pretest counselor, blood draw/prick, and post-test counseling. A large proportion were also present during disclosure of results, suggesting that the test visit is an important interventional opportunity for counselors to assist with early disclosure and building social and emotional support from the moment of learning one's results. Indeed, several counselors noted that disclosure is often easier after immediately finding out one's positive status due to the shock and immediate need for comfort. Disclosure allows AYA to receive emotional and practical support and is associated with better adherence to treatment and thus better mental and physical health outcomes.[25] Consistent with this need for support, qualitative research performed among AYA in this study found they greatly appreciated concurrent HIV testing with their parents, and found this to be an ideal emotional environment in which to learn their own HIV status [Wilson, manuscript in preparation].

There has been little research to date focused specifically on the role of support persons in the AYA HIV testing visit, our results are consistent with existing literature that has examined HIV testing behaviors in AYA. In 1998, the Horizons Program, which studied facilitators, barriers, and perceptions among youth presenting at Voluntary Testing and Counseling Centers

in Nairobi, reported that 36% of AYA aged 14-21 were unaccompanied to the clinic for testing and AYA were most likely to be accompanied to the clinic by peers.[20]

There were some significant differences between AYA presenting with SP compared to those presenting for testing alone. SP presenting with peers were 50% less likely to have correct HIV prevention knowledge compared to unaccompanied, after adjusting for age and whether this was the AYA's first HIV test. This association has not been previously determined and could have important implications on future programs.

Our study has many strengths and a few important weaknesses to note. To our knowledge, ours is the first study to present age-stratified data about support persons accompanying AYA to the clinic for testing and to characterize parts of the testing experience for which SP are present. These data can help improve programs and policies regarding AYA HIV testing and counseling. However, this is a cross-sectional study; therefore, we cannot assume a temporal relationship or infer causality between exposures and outcomes. This is specifically problematic in Aim 3, as it is difficult to determine whether SP, as a proxy for support, affects HIV knowledge and history of care-seeking of sexual and reproductive health services or increased knowledge or prior care-seeking of SRHS influences AYA SP at the VCT. KNH is a referral hospital in the Nairobi; people tend to travel far to receive care here and may thus have socioeconomic status or stigma concerns that are distinct from the general population of their peers. The data, therefore, may not be generalizable to other settings, for instance, in rural Kenya. We do not have survey data about AYA risk or motivation to test, which could be significant confounders. While we do have the reason for coming to the VCT, perceived risk for HIV could be importantly related to AYA SP.

Peers, partners, and parents play an important role in a Kenyan AYAs' testing experience. Defining the role of SP in the HIV testing visit and AYA care-seeking behaviors can inform strategies that leverage this support to enhance AYA HIV testing and care. Further research on how SP can be utilized to promote AYA HIV testing is necessary. Understanding AYA motivations for testing for HIV may also be important to further defining the role of SP in AYA HIV testing.

References

1. Bekker LG, Johnson L, Wallace M, Hosek S. Building our youth for the future. *J Int AIDS Soc.* 2015;18:20027.
2. World Health Organization. Adolescents falling through gaps in HIV services. 2013.
3. All In to #EndAdolescentAIDS 2015.
4. National AIDS and STI Control Programme (NASCOP). Kenya Aids Indicator Survey 2012 (KAIS).
5. Secor-Turner M, Randall BA, Mudzongo CC. Barriers and Facilitators of Adolescent Health in Rural Kenya. *J Transcult Nurs.* 2016; 27:270-276.
6. World Health Organization. Adolescent Friendly Health Services. 2002.
7. Kibaara C, Blat C, Lewis-Kulzer J, et al. Treatment Buddies Improve Clinic Attendance among Women but Not Men on Antiretroviral Therapy in the Nyanza Region of Kenya. *AIDS Res Treat.* 2016;2016:9124541.
8. Nakigozi G, Makumbi FE, Bwanika JB, et al. Impact of Patient-Selected Care Buddies on Adherence to HIV Care, Disease Progression, and Conduct of Daily Life Among Pre-antiretroviral HIV-Infected Patients in Rakai, Uganda: A Randomized Controlled Trial. *J Acquir Immune Defic Syndr.* 2015;70:75-82.
9. Cluver LD, Hodes RJ, Sherr L, et al. Social protection: potential for improving HIV outcomes among adolescents. *J Int AIDS Soc.* 2015;18:20260.
10. Vig J, Miller KS, Chirwa-Motswere C, Winskell K, Stallcup E. Involving parents from the start: formative evaluation for a large randomised controlled trial with Botswana Junior Secondary School students. *Afr J AIDS Res.* 2016;15:9-15.
11. Chair SY, Wong KB, Tang JY, Wang Q, Cheng HY. Social support as a predictor of diet and exercise self-efficacy in patients with coronary artery disease. *Contemp Nurse.* 2016:1-12.
12. Siceloff ER WD, Van Horn L. A Longitudinal Study of the Effects of Instrumental and Emotional Social Support on Physical Activity in Underserved Adolescents in the ACT Trial. *Annals of behavioral medicine : a publication of the Society of Behavioral Medicine*. 2014, doi:10.1007/s12160-013-9571-x. -.
13. Ling Jea. "Social Support and Peer Norms Scales for Physical Activity in Adolescents." *American journal of health behavior* 38.6 (2014): 881–889.*PMC*. Web. 10 May 2016. .
14. Smith LH, Petosa RL. A Structured Peer-Mentoring Method for Physical Activity Behavior Change Among Adolescents. *J Sch Nurs.* 2016.
15. Hagey JM, Akama E, Ayieko J, Bukusi EA, Cohen CR, Patel RC. Barriers and facilitators adolescent females living with HIV face in accessing contraceptive services: a qualitative assessment of providers' perceptions in western Kenya. *J Int AIDS Soc.* 2015;18:20123.
16. Strauss M, Rhodes B, George G. A qualitative analysis of the barriers and facilitators of HIV counselling and testing perceived by adolescents in South Africa. *BMC Health Serv Res.* 2015;15:250.
17. Bhoobun S, Jetty A, Koroma MA, et al. Facilitators and barriers related to voluntary counseling and testing for HIV among young adults in Bo, Sierra Leone. *J Community Health.* 2014;39:514-520.

18. Boyer CB, Hightow-Weidman L, Bethel J, et al. An assessment of the feasibility and acceptability of a friendship-based social network recruitment strategy to screen at-risk African American and Hispanic/Latina young women for HIV infection. *JAMA Pediatr.* 2013;167:289-296.
19. Talib HJ, Silver EJ, Coupey SM, Bauman LJ. The influence of individual, partner, and relationship factors on HIV testing in adolescents. *AIDS Patient Care STDS.* 2013;27:637-645.
20. Horizons Program. HIV Voluntary Counseling and Testing Among Youth. Kenya Project Partners and Uganda Project Partners, ed. *Results from an exploratory study in Nairobi, Kenya and Kampala and Masaka, Uganda*: The Population Council Inc.; 2001.
21. Lamb MR, Fayorsey R, Nuwagaba-Biribonwoha H, et al. High attrition before and after ART initiation among youth (15-24 years of age) enrolled in HIV care. *AIDS.* 2014;28:559-568.
22. Okigbo CC, Kabiru CW, Mumah JN, Mojola SA, Beguy D. Influence of parental factors on adolescents' transition to first sexual intercourse in Nairobi, Kenya: a longitudinal study. *Reprod Health.* 2015;12:73.
23. Carl Hartung, Yaw Anokwa, Waylon Brunette, Adam Lerer, Clint Tseng, Gaetano Borriello. Open Data Kit: Tools to Build Information Services for Developing Regions. New York, NY, USA: ICTD '10 Proceedings of the 4th ACM/IEEE International Conference on Information and Communication Technologies and Development; 2010.
24. Simons LK. Blame it on the Brain. CROI. 2016.
25. World Health Organization. Adolescent HIV Testing, Counselling, and Care: World Health Organization; 2014.

Tables and Figures

Figure 1:

*AYA indicated that they were accompanied by more than one type of support person

† $p<0.05$ when comparing AYA aged 14-19y and 20-24y

Table 1: Characteristics of AYA included in the study

	N=227 n(%) or Mean(SD) or Median(IQR)
Demographics	
Age	21 (19, 23)
14-19	63 (27.8)
20-24	164 (72.3)
Female	123 (54.2)
Highest level of education completed	17 (12,19)
Primary	11 (4.9)
Secondary	48 (21.2)
Polytechnic	7 (3.1)
University/college	161 (70.9)
Currently enrolled in school	182 (80.2)
Self-reported HIV status	
Positive	5 (1.7)
Negative	215 (94.7)
Prefer not to say	7 (3.1)
Characteristics of testing visit	
Site	
Upstairs VCT	65 (28.6)
Youth Centre	111 (48.9)
Tents	51 (22.5)
Primary reason for coming to VCT (N=134)	
HIV test	106 (79.1)
Testing for non-HIV STIs	-
General health information or counseling	20 (14.9)
Family planning	-
Pregnancy test	1 (0.8)
Other	7 (5.2)
First time visiting this clinic	91 (67.9)
First HIV test	43 (32.1)
Overall satisfaction with testing visit (1-5)	5 (4,5)
Terrible	4 (1.8)
Poor	1 (0.4)
Average	16 (7.1)
Good	72 (31.7)
Excellent	134(59.0)
Healthcare worker discussed HIV prevention	
Yes, they gave me the right amount of information	199 (87.7)
Yes, but I would have liked more information	26 (11.5)

No	2 (0.9)
Provider discussed FP	18 (13.4)
Provider discussed STI	51 (38.1)
Knowledge of HIV	
Correct knowledge of HIV prevention	113 (49.8)
Correct knowledge of HIV transmission	56 (24.7)
Responded that a healthy-looking person can have HIV	
Yes	213 (93.8)
No	2 (0.9)
Don't know	12 (5.3)
HIV treatment (among HIV-positive)	
Provider discussed HIV treatment (N=5)	1 (0.2)
Know where to access treatment services and enroll in HIV care (N=5)	4 (0.8)
Plan to enroll in HIV care (N=2)	1 (0.5)
Sexual and reproductive health services	
Ever gone to a clinic for FP	18 (7.9)
Ever gone to a clinic for STI testing	56 (24.7)
Know of clinic that does STI testing	114 (51.1)
Intent to retest	
Likely to get another HIV test in the next year (N=222)	
Very likely	140 (63.1)
Somewhat likely	15 (6.8)
Neutral	31 (14.0)
Somewhat unlikely	15 (6.8)
Not at all likely	21 (9.5)
How soon next HIV test will be (N=222)	
Less than 6 months from today	134 (60.4)
7-12 months from today	24 (10.8)
More than one year from today	9 (4.1)
When I have a new partner	22 (9.9)
Other	33 (14.9)
Return to this clinic for HIV retest (N=222)	
Very likely	141 (63.5)
Somewhat likely	22 (9.9)
Neutral	23 (10.4)
Somewhat unlikely	22 (9.9)
Not at all likely	14 (6.3)
Involvement of support persons	
People involved in testing decision	
No one	79 (34.8)
Parents	24 (10.6)
Other family members	12 (5.3)
Doctor/health care worker	35 (15.4)

Friends	63 (27.8)
Boyfriend/girlfriend	38 (16.7)
church member/youth group member	4 (1.8)
counselor	23 (10.1)
none of these people were involved	20 (8.8)
People who accompanied adolescent to the clinic for testing (N=226)	
No one	99 (43.8)
Parents	14 (6.2)
Peer	79 (35.0)
Partner	21 (9.3)
Multiple groups	7 (3.1)
Other	6 (2.7)
Parts of testing experience support person was present for (N=127)	
Pre-test counseling	69 (30.4)
Finger prick/blood draw	77 (33.9)
Disclosure of results	33 (14.5)
Post-test counseling	39 (17.2)
None of these, waited in waiting room	21 (9.3)

Table 2: Comparing Accompanied AYA to Unaccompanied AYA

Table 2: Comparing Accompanied Adolescents to Unaccompanied Adolescents

		Accompanied (alone is referent) Alone (99) N=226			
Cofactors	**n(%)**	**RR**	**p-value**	**ARR**	**p-value**
Age		0.91 (0.85, 0.98)	0.012	-	-
14-19	44(34.7)	1.37 (0.95, 1.98)	0.09	-	-
20-24	83(65.4)	REF	REF	-	-
Female*	74(58.3)	1.17 (0.82, 1.66)	0.385	1.09 (0.76, 1.56)	0.634
Highest level of education completed		0.98 (0.94, 1.03)	0.507	-	-
Primary	8(6.3)	1.28 (0.62, 2.63)	0.505	-	-
Secondary	25(19.7)	0.92 (0.59, 1.43)	0.697	-	-
Polytechnic	3(2.4)	0.75 (0.24, 2.38)	0.63	-	-
University/ college	91(71.7)	-	-	REF	REF
Currently enrolled in school	106(83.5)	1.26 (0.79, 2.00)	0.342	-	-
First time receiving an HIV test* (n=59)	26(34.7)	1.12 (0.70, 1.81)	0.633	0.95 (0.56, 1.60)	0.842

*Adjusted for age as a continuous linear term

Table 3: Association between support persons and knowledge and sexual and reproductive services

Table 3a: Knowledge of HIV

	Correct prevention knowledge					Correct transmission knowledge				
	n(%)	**RR**	**p-value**	**ARR**	**p-value**	**n(%)**	**RR**	**p-value**	**ARR**	**p-value**
Alone	63(63.6)	REF	REF	REF	REF	23(23.2)	REF	REF	REF	REF
Someone	49(38.6)	0.64 (0.45, 0.91)	0.014	0.65 (0.40, 1.03)	0.067	33(26.0)	1.07 (0.72, 1.58)	0.735	1.21 (0.73, 2.01)	0.468
Peer	29(36.7)	0.54 (0.34, 0.85)	0.009	0.50 (0.28, 0.91)	0.022	28(35.4)	1.37 (0.86, 2.17)	0.184	1.5 (0.82, 2.74)	0.184
Partner	7(33.3)	0.36 (0.14, 0.88)	0.026	0.67 (0.19, 2.35)	0.531	2(9.5)	0.40 (0.09, 1.71)	0.218	0.31 (0.04, 2.47)	0.269
Parent	6(42.9)	0.48 (0.17, 1.38)	0.172	0.44 (0.08, 2.448)	0.355	1(7.1)	0.29 (0.04, 2.18)	0.227	3.09 (0.24, 39.78)	0.387

Table 3b: Prior care-seeking

	Previously sought FP					STI test				
	n(%)	**RR**	**p-value**	**ARR**	**p-value**	**n(%)**	**RR**	**p-value**	**ARR**	**p-value**
Alone	9(9.1)	REF	REF	REF	REF	24(24.2)	REF	REF	REF	REF
Someone	9(7.1)	0.88 (0.45, 1.74)	0.715	0.61 (0.40, 1.94)	0.404	32 (25.2)	1.02 (0.69, 1.53)	0.913	1.19 (0.69, 2.04)	0.53
Peer	4(5.1)	0.68 (0.25, 1.85)	0.447	0.31 (0.04, 2.25)	0.247	16(20.3)	0.88 (0.51, 1.52)	0.637	1.05 (0.52, 2.12)	0.885
Partner	2(9.5)	1.04 (0.24,4.48)	0.995	0.85 (0.11, 6.72)	0.879	9(42.9)	1.98 (0.83, 4.69)	0.122	1.89 (0.55, 6.54)	0.313
Parent	1(7.1)	0.79 (0.10, 6.06)	0.822	-	-	2(14.3)	0.56 (0.12, 2.49)	0.445	-	-

All of the above factors were adjusted for age as a linear continuous term and first HIV test