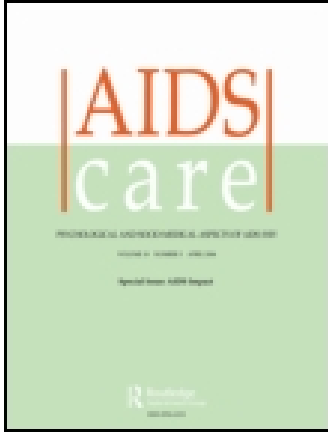


This article was downloaded by: [Erasmus University]

On: 28 October 2014, At: 09:20

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/caic20>

Self reported risk reduction behavior associated with HIV counseling and testing: A comparative analysis of facility- and home-based models in rural Uganda

Edgar M. Mulogo^a, Aden S. Abdulaziz^b, Ranieri Guerra^b, Ben Bellows^c & Sebastian O. Baine^d

^a Department of Community Health, Mbarara University of Science and Technology, Mbarara, Uganda

^b International Centre for Health Management, Istituto Superiore di Sanita, Rome, Italy

^c Population Council, Nairobi, Kenya

^d School of Public Health, Makerere University Kampala, Kampala, Uganda

Published online: 19 Oct 2012.

To cite this article: Edgar M. Mulogo, Aden S. Abdulaziz, Ranieri Guerra, Ben Bellows & Sebastian O. Baine (2013) Self reported risk reduction behavior associated with HIV counseling and testing: A comparative analysis of facility- and home-based models in rural Uganda, *AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV*, 25:7, 835-842, DOI: [10.1080/09540121.2012.729805](https://doi.org/10.1080/09540121.2012.729805)

To link to this article: <http://dx.doi.org/10.1080/09540121.2012.729805>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Self reported risk reduction behavior associated with HIV counseling and testing: A comparative analysis of facility- and home-based models in rural Uganda

Edgar M. Mulogo^{a*}, Aden S. Abdulaziz^b, Ranieri Guerra^b, Ben Bellows^c and Sebastian O. Baine^d

^aDepartment of Community Health, Mbarara University of Science and Technology, Mbarara, Uganda; ^bInternational Centre for Health Management, Istituto Superiore di Sanita, Rome, Italy; ^cPopulation Council, Nairobi, Kenya; ^dSchool of Public Health, Makerere University Kampala, Kampala, Uganda

(Received 16 January 2012; final version received 10 September 2012)

Home-based human immunodeficiency virus (HIV) voluntary counseling and testing (VCT) in Uganda is being promoted to increase coverage, in addition to main stay approach of service provision through health facilities. The aim of this study was to compare self reported risk reduction behavior among clients receiving facility and home-based HIV VCT within a rural context. Pre-post intervention client surveys were conducted in November 2007 (baseline) and March 2008 (follow up) in southwestern Uganda. The facility-based VCT intervention was provided to 500 clients and home-based VCT to 494 clients at baseline, in 2 different sub-counties. A total of 76% (759/994) of these clients were interviewed at the follow up visit. The respondents who received facility-based VCT were more likely to report abstinence (adjusted Odds Ratio [aOR] = 1.47, 95% CI 1.074, 2.02), reducing multi sexual relationships (aOR = 3.23, 95% CI 2.02, 5.16) and more frequent use of condoms (aOR = 3.14, 95% CI 1.60, 6.18). However, they were less likely to report, discussing HIV (aOR = 0.63, 95% CI 0.46, 0.85) with their sexual partner/s and having sex with only one partner (aOR = 0.72, 95% CI 0.519–0.99). While facility-based VCT appears to promote abstinence and condom use home-based VCT on the other hand promotes faithfulness and disclosure. VCT services should, therefore, be provided through both models in a complementary relationship and not as surrogates within given settings.

Keywords: risk reduction behavior; facility and home-based VCT; Uganda

Introduction

Uganda has made remarkable progress in reversing the trend of human immunodeficiency virus (HIV)/AIDS epidemic in the past two decades. The Uganda HIV/AIDS Sero-Behavioral Survey conducted in 2004/2005 showed an average national adult HIV prevalence of 6.4% (MOH, 2006) for the 15–49 age group, down from a national antenatal prevalence of 18% in the early 1990s (Uganda AIDS Commission, 2008). This achievement has largely been attributed to the abstinence, be-faithful, and condom use (ABC) strategy. The ABC strategy has since been expanded to the ABC Plus, to include voluntary counseling and testing (VCT), prevention of mother-to-child transmission of the virus, antiretroviral treatment, and HIV/AIDS care and support services (Bwambale, Ssali, Byaruhanga, Kalyango, & Karamagi, 2008; MOH & ORC Macro, 2006).

HIV VCT is a key component of national AIDS programs in sub-Saharan Africa, especially in prevention and treatment (Matovu et al., 2007). VCT can be offered through different innovative approaches such as in the work place, in mobile clinics, and using the home-based model (WHO, 2007).

Conventionally, VCT services are provided through primary health care facilities (facility-based model), stand-alone clinics (such as targeting reproductive health), and mobile outreach programs. However, facility-based VCT may not appeal to groups who often do not go readily to health facilities, such as young people and men. Also, in the presence of competing interest, staff may not be committed to the VCT program at a health facility (Bateganya, Abdulwadud, & Kiene, 2007). The provision of VCT through a home-based approach was, therefore, initiated to address some of the pertinent gaps of the facility-based services in the country. In the home-based model, CT is offered within the home to family members, including children where appropriate (FHI, 2005) and involves the use of lay counselors or community health workers to provide counseling and testing. The counselors and testers move from door to door, provide pre-test counseling, and take consent from eligible family members (Bateganya et al., 2007). For this reason, it is sometimes referred to as the family-based model (FHI, 2005).

The UNAIDS in its guidelines on terminology reports that an alternative term for VCT is client

*Corresponding author. Email: emulogo2000@gmail.com

Aden S Abdulaziz, Ranieri Guerra, Ben Bellows and Sebastian O Baine contributed equally to this work.

initiated testing (UNAIDS, 2008). VCT relies mostly on individuals presenting themselves for HIV testing and giving voluntary informed consent (Bateganya et al., 2007; Ministry of Health, 2003). During the VCT process individuals or couples undergo pre-test counseling, risk assessment, a same-day rapid HIV test, post-test HIV prevention counseling, and referral for medical and support services by trained counselors (Irungu, Varkey, Cha, & Patterson, 2008). The post-test counseling gives high-risk HIV-uninfected individuals the opportunity to re-think about their lives and change the risk sexual behaviour and that of their drug-using partners. For those testing positive, post-test counseling focuses on risk-reduction to HIV-uninfected partners in order to prevent new infections, as well as linking positive individuals into care and treatment services. It has been suggested that, AIDS is first and foremost a consequence of behavior and, therefore, it is not who one is, but what one does, that determines whether he or she will expose themselves or others to HIV (Buvé, Bishikwabo-Nsarhaza, & Mutangadura, 2002; Fishbein, 2000). As a result, scaling of VCT services is likely to bring down the HIV incidence through reductions in high-risk behavior (Matovu et al., 2007).

Measures of sexual risk behavior used in previous studies have included having a primary partner, a casual partner, a commercial partner, and unprotected sex with any of these partners (Matovu et al., 2007; Sangiwa, van der Straten, Grinstead, & VCT Study Group, 2000). The HIV sero-behavioral survey of 2004–2005 in Uganda considered sex with non-marital, noncohabitating partners, and trading money for sex as high-risk sexual behaviors. This survey reported that 15% of the sexually active women and 37% men aged 15–49 years had sex with a nonmarital, noncohabiting partner within the 12 months preceding the study (MOH & ORC Macro, 2006). Other measures risk reduction behavior include; abstinence, consistent condom use, reduction in number of partners, having sex with only one partner, and discussing HIV and condoms with sexual partners (Efficacy Study Group, 1995). Sexual abstinence until marriage and thereafter mutual faithfulness to one partner is the pillar of HIV prevention (Kirungi et al., 2006).

It has been reported that uptake and behavioral responses associated with VCT are influenced by interaction of factors such as age, gender, HIV status, beliefs, and attitudes (Fylkesnes & Siziya, 2004; Mulogo, Abdulaziz, Guerra, & Baine, 2011; Sangiwa, 2000). Previous facility-based studies have demonstrated that VCT results in reduction in risk behavior (Arthur et al., 2007; Kamali et al., 2003; Lifshay et al., 2009; Sangiwa et al., 2000; Sweat et al., 2000; Turner et al., 2009;

Weinhardt, Carey, Johnson, & Bickham, 1999; Wolff et al., 2005). A study conducted following provision of VCT through a community out-reach program reports that sexual behavior change remains unproven (Kipp, Kabagambe, & Konde-Lule, 2002). While, in rural Uganda Matovu et al report that testers in rural Uganda were less likely to reduce their sexual risk behaviors following repeat VCT (Matovu et al., 2007). Another study also reports limited evidence that HIV testing resulted in safe sex behavior (Kabiru, Luke, Izugbara, & Zulu, 2010).

A study done on home-based VCT reports that it enhances disclosure among couples (Bateganya et al., 2007). While another evaluation of home-based VCT was skeptical about its efficacy and social consequences (Wolff et al., 2005).

These mixed results from the different studies indicate a need for further research to examine the relationship between VCT service provision models and behavior outcomes. This article comparatively evaluates risk reduction behavior outcomes among clients receiving VCT through the facility-and home-based models within a rural context. Considering that the home-based model is being promoted as a strategy for improving access it is expected that information from this analysis will contribute to policy decisions regarding provision of VCT for rural communities in Uganda.

Methods

Design and sample population

Pre-post intervention client surveys (FHI, 2006) were conducted in two sub-counties (Rugando and Kabingo) in southwestern Uganda with data collected at baseline (November 2007) and follow-up (March 2008) visits following the provision of facility and home-based VCT interventions. Rugando and Kabingo are found in Mbarara and Isingiro districts that have estimated populations of 418,300 and 385,500, respectively (UBOS, 2009).

Sample size

The sample size was calculated using a formula for detecting differences in proportions of two groups (D'Agostino, Sullivan, & Beiser, 2006) and was based on an assumed level of uptake of 60% and 70% for facility and home-based VCT, respectively (Mulogo et al., 2011). Assuming an error rate of 0.05 and a power of 90% a sample size of 472 per group was calculated.

Procedure

Following mobilization of communities in the two study sites, VCT was offered at a health facility in Rugando and the household level in Kabingo. At the facility pre- and post-test counseling was provided by a trained counselor (midwife) and HIV testing was performed by a laboratory technician. Pre- and post-counseling for home-based VCT was provided by integrated trained counselors who had previously been trained to perform both the counseling and testing function (Asiimwe, Muganzi, Tumwesigye, Achom, & Tappero, 2007). Prior to the study all counselors were re-oriented using the national counselor training manual (Ministry of Health, 2005a). HIV testing followed the nationally recommended three test (Determine, Unigold, and Statpak) algorithm (Ministry of Health, 2005b).

In the facility-based VCT group, participants were sampled consecutively until the sample size was attained. While in the home-based group households were randomly selected from a sampling frame for each of the villages visited and VCT offered to one adult aged 18–59 years. A mixed survey instrument was administered to 994 and 759 participants at the baseline and follow up visits, respectively, following written informed consent. Ethical clearance was sought and obtained from the Institutional Review Board at Mbarara University of Science and Technology. The study profile is illustrated in Figure 1.

Variables

The dependent variable was risk reduction behavior as reported by the study participant while the primary

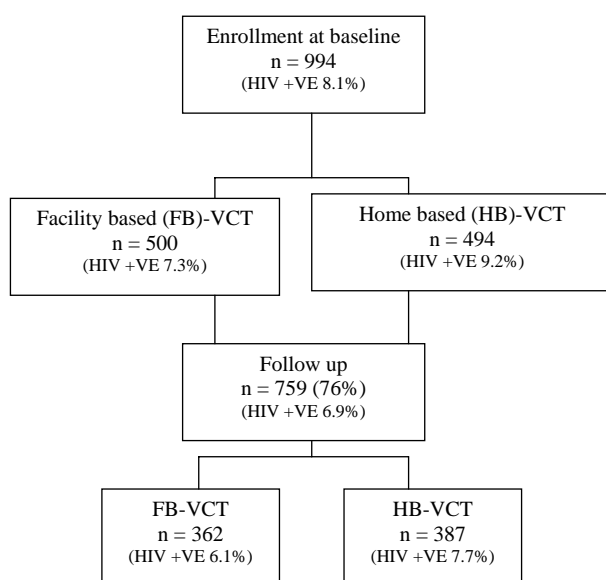


Figure 1. Study profile.

predictor variable was VCT service model (facility- or home-based). To assess individual risk reduction behavior at the baseline and follow-up visits, the participants were asked whether they had done a number of different things to reduce their risk of being infected with HIV and others STDs. The different things included whether they had; abstained from sex, used condoms every time they had sex, used condoms more often, changed the way they selected sexual partners, reduced or limited the number of different sexual partners they had, discussed HIV with sexual partner (used here as a proxy measure for disclosure), and had sex with only one individual. Responses were coded as yes (1) or no (2), while those who declined to answer as 99. The participants who declined to answer were excluded from the analysis.

Analysis

In order to investigate the relationship between the dependent variable (risk reduction behavior) and other variables logistic regression models were run using the backward variable elimination method. All the variables were dichotomized for the analysis that was run using Statistical Package for Social Sciences version 12 (SPSS, Chicago, IL, USA). The results presented in this article are derived from the baseline and follow-up visit data.

Results

Background characteristics of respondents

All respondents who were offered either facility- (500) or home-based VCT (494) accepted testing and received results. The drop out rate from baseline to follow up visit was 28% among the facility-based respondents and 20% for the home-based model. The characteristics of the respondents at baseline and follow up are compared by type of VCT model in Table 1.

Among the respondents receiving VCT at baseline 31% were male and 69% female. A similar proportion of male and female respondents received VCT at the follow-up visit (29% and 71%, respectively). The baseline group was significantly younger than the follow up group ($p < 0.001$) and had a smaller proportion of respondents who had ever been married ($p < 0.0001$).

Association between type of VCT model and risk reduction behavior

Respondents were asked questions about their risk reduction behavior for the 2 month period before

Table 1. A comparison of the background characteristics at the baseline and follow up visits.

Characteristic	Baseline (n = 994) n (%)		Follow up (n = 759) n (%)		p-Value
	FB-VCT	HB-VCT	FB-VCT	HB-VCT	
Gender					
Male	139 (28)	156 (33)	92 (25)	127 (32)	
Female	351 (72)	326 (67)	270 (75)	266 (68)	0.51 ^a
Age: Mean (SD)	31.8 (11.3)	32.7 (10.7)	33.4 (11.3)	33.5 (10.0)	0.001 ^b
Ever attended school					
Yes	385 (79)	374 (77)	300 (83)	298 (76)	
No	100 (21)	112 (23)	62 (17)	95 (24)	0.61 ^a
Years of education					
Mean (SD)	5.8 (4.3)	5.2 (4.0)	6.1 (4.1)	5.2 (3.9)	0.45 ^b
Ever married					
Yes	287 (62)	336 (75)	294 (81)	334 (88)	
No	179 (38)	112 (25)	68 (19)	46 (12)	< 0.0001 ^a
Monthly income median	30,000	30,000	40,000	31,000	na
HIV Status					
Positive	36 (7)	45 (9)	21 (6)	30 (8)	
Negative	454 (93)	444 (91)	322 (94)	361 (92)	0.31

^aChi Square-test.^bt-test.

na, not applicable; SD, standard deviation.

receiving VCT at baseline visit. At the follow up visit the respondents were again asked about their risk reduction behavior in the previous 2 months. The self reported risk reduction behavior is compared by VCT model in Table 2.

There were no significant differences in the proportions of clients reporting particular risk reduction behavior at baseline. However, the proportion of facility-based clients reporting discussion of HIV with their sexual partner(s) was significantly less than that for home-based VCT at baseline (OR = 0.59 95%CI 0.44, 0.79). At follow-up clients who received facility-based VCT were more likely to have abstained from sex (OR = 1.46, 95%CI 1.07, 1.98), used a condom every time they had sex (OR = 2.34, 95%CI 1.26, 4.33), used condoms more often (OR = 2.81, 95%CI 1.45, 5.43), and reduced or limited the number of

different sexual partners they had (OR = 3.26, 95%CI 2.05, 5.17), between the baseline and follow visits. However, they were less likely to discuss HIV (OR = 0.38, 95%CI 0.26, 0.56) and condoms (OR = 0.73, 95%CI 0.53, 0.99) with their sex partners.

Association between HIV serostatus at baseline and self reported risk reduction behavior at follow up

About 7% of the facility-based respondents tested positive at the baseline visit, while 8% of the home-based respondents were sero-positive. This result was, however, not statistically significant (OR = 0.51, 95% CI 0.46, 1.41). Table 3 compares the HIV sero-status of the respondents at baseline by reported risk reduction behavior at the follow up visit adjusted for age and sex.

Table 2. A comparison of risk reduction behavior as reported in the 2 months before and after receiving VCT.

Behavior (yes)	Baseline (n = 975) n (%)			Follow-up (n = 752) n (%)		
	FB VCT	HB VCT	OR(95%CI)	FB VCT	HB VCT	OR (95% CI)
Abstained from sex	153 (31)	176 (36)	0.80 (0.61, 1.04)	129 (36)	108 (28)	1.46 (1.07, 1.98)
Used condoms every time I had sex	18 (4)	15 (3)	1.21 (0.60, 2.42)	33 (9)	16 (4)	2.34 (1.26, 4.33)
Used condoms more often	17 (4)	29 (6)	0.57 (0.31, 1.04)	32 (9)	13 (3)	2.81 (1.45, 5.43)
Reduced number of sexual partners	21 (4)	21 (4)	0.99 (0.53, 1.83)	73 (20)	28 (7)	3.26 (2.05, 5.17)
Discussed HIV with sexual partner(s)	97 (20)	144 (30)	0.59 (0.44, 0.79)	113 (31)	165 (42)	0.62 (0.46, 0.84)
Discussed condoms with sexual partner(s)	45 (9)	46 (10)	0.97 (0.63, 1.49)	45 (12)	106 (27)	0.38 (0.26, 0.56)
Had sex with only one partner	307 (63)	325 (62)	0.86 (0.66, 1.12)	233 (65)	257 (71)	0.73 (0.53, 0.99)

Note: The bold values show statistically significant results.

Table 3. Association between HIV serostatus at baseline and reported risk reduction behavior at follow up.

Behavior (Yes)	HIV serostatus		aOR (95%CI)
	+VE n (%)	-VE n (%)	
Abstained from sex	25 (48)	207 (30)	2.06 (1.18, 3.62)
Used condoms every time I had sex	7 (14)	42 (6)	2.36 (0.99, 5.62)
Used condoms more often	7 (14)	38 (6)	2.63 (1.10, 6.30)
Reduced or limited the number of different sexual partners I have had	5 (10)	94 (14)	0.67 (0.26, 1.72)
Discussed HIV with sexual partner(s)	16 (31)	257 (38)	0.74 (0.40, 1.35)
Discussed condoms with sexual partner(s)	15 (29)	134 (20)	1.66 (0.89, 3.12)
Had sex with only one partner	27 (53)	451 (69)	0.50 (0.28, 0.90)

Note: The bold values show statistically significant results.

Independent of age and sex, the respondents who tested positive at baseline were more likely to report; abstaining (OR = 2.06 95% CI = 1.18, 3.62) and using condoms more often (OR = 2.63 95%CI = 1.10, 6.30). While those who tested HIV negative were more likely to report having sex with only one partner in the intervening period up to the follow up visit (OR = 0.50 95%CI = 0.28, 0.90).

Multivariable logistic regression analysis

In order to control for confounding effects of age, gender, and HIV status a logistic regression was done with risk reduction behavior as the outcome. The results are shown in the Table 4.

The type of VCT model used at baseline was independently associated with risk reduction behavior reported at the follow up visit. Respondents who received facility-based VCT were more likely to report abstinence (adjusted Odds Ratio [aOR] = 1.47, 95% CI 1.07, 2.02), reducing multi-sexual

relationships (aOR = 3.23, 95% CI 2.02, 5.16), and more frequent use of condoms (aOR = 3.14, 95% CI 1.60, 6.18). However, they were less likely to discuss HIV (aOR = 0.63, 95% CI 0.46, 0.85) and condom use (aOR = 0.39, 95% CI 0.27, 0.58) with their sexual partner(s). They were also less likely to report having sex with only one partner (aOR = 0.72 95% CI 0.52, 0.99).

Discussion

The current study reports that the type of VCT model influences the risk reduction behavior adopted by a client. Consistent with studies conducted elsewhere our findings show that VCT promotes a modification of HIV prevention behavior (Efficacy Study Group, 2000; Lifshay et al., 2009; Mola et al., 2006; Muller et al., 1992; Pattanaphesaj & Teerawattananon, 2010; Ryder et al., 1991; Sahlu et al., 1999; Sangiwa et al., 2000; Weinhardt et al., 1999).

Further, HIV serostatus influences the type of risk reduction behavior adopted. HIV seropositive respondents were more likely to abstain, use condoms more consistently, and limit the number of multi-sexual relationships. This finding is similar to that reported in Tanzania (Sangiwa et al., 2000). Other studies have also reported increased condom use and reduced frequency and numbers of partners among HIV positive participants (Arthur et al., 2007; Inciardi, Surratt, Kurtz, & Weaver, 2005; Lifshay et al., 2009; Morah, 2007; Turner et al., 2009). The change in behavior reported here is probably based on the fact that HIV is a life threatening illness and the risk reduction behavior adopted prevents the transmission of HIV. This suggests that these respondents are worried about the likelihood of transmission of HIV to their sexual partners whose serostatus they might know or not know. Consistent with studies elsewhere, HIV negative respondents were more likely to report changing their risky behavior

Table 4. Adjusted Odds Ratios from multivariable logistic regression.

Behavior	Adjusted OR		
	(aOR)	95% CI	p-Value
Abstained from sex	1.47	1.07–2.02	0.02
Used condoms every time I had sex	2.63	1.40–4.93	< 0.01
Used condoms more often	3.14	1.60–6.18	0.001
Reduced or limited number of partners	3.23	2.02–5.16	< 0.001
Discussed HIV with sexual partner(s)	0.63	0.46–0.85	< 0.01
Discussed condoms with sexual partner(s)	0.39	0.27–0.58	< 0.001
Had sex with only one partner	0.72	0.52–0.99	0.04

such as having sex with only one partner following receipt of VCT at the baseline visit (Cremin, Nyamukapa, Sherr, Hallet, & Cauchemez, 2009). This finding suggests that testing negative also lowers the likelihood of engaging in risky sex behavior.

Independent of age, gender, and HIV serostatus the type of VCT model at the baseline influenced the risk reduction behavior that was adopted. As reported in other studies, respondents who receive facility-based VCT are likely to report, abstinence, reducing multi-sexual relationships, and more frequent use of condoms (Arthur et al., 2007; Mola et al., 2006). On the other hand, respondents who received the home-based VCT were more likely to discuss HIV and condom use with their sexual partner(s), and have only one sexual partner. This finding is of public health importance in suggesting that clients who receive home-based VCT may be more willing to disclose their HIV status to sexual partners than those receiving facility-based HIV related services, also reported by Bateganya et al. (2007). One reason for this behavioral outcome is that clients tend to seek facility-based VCT without the knowledge of their sexual partner(s), while in a home setting the partner(s) is (are) aware that VCT services have been accessed. The clients receiving home-based HIV services are, therefore, “coerced” to disclose the outcome of the test and may be have sex with only that partner. Therefore, in order to facilitate the adoption of a range of positive behavioral outcomes within rural communities, VCT should be provided through both models in a complementary relationship and not as surrogates.

Limitations

The pre-post intervention design used for this study is prone to bias if there are substantial losses to follow up. However, the loss to follow up in this study was considered reasonable enough. Second the facility-based group was self selected which may have probably been determined by their risk taking behavior. The study findings, however, show that this risk reduction behavior was comparable to that of the home-based group at baseline. Third the findings are based on self reported data which are likely to be subject to recall and social desirability biases. This may affect the magnitude of the effect estimates of particular risk reduction behavior. However, the findings are comparable with results from studies conducted elsewhere suggesting that the biases did not change the effect estimates. Finally this study did not evaluate the quality of counseling in either model which could again affect the effect estimates.

Conclusions

The mode of delivery of VCT influences the risk reduction behavior adopted. Facility-based VCT services appear to promote behavioral outcomes related to abstinence and condom use. Home-based VCT on the other hand promotes faithfulness and disclosure. Given the complimentary role of either model interventions seeking to improve service coverage should provide potential clients with an option of both facility and home-based services within a given setting. This is likely to further reinforce “abstinence, be faithful, condom use and disclosure” strategy that has been the main stay of HIV/AIDS prevention in Uganda.

Acknowledgements

The study team extends its appreciation to the Insitute Superiore di Sanita for the support provided and also acknowledges the contribution of the health workers, research assistants and community members.

References

- Arthur, G., Nduba, V., Forsythe, S., Mutemi, R., Odhiambo, J., & Gilks, C. (2007). Behaviour change in clients of health centre-based voluntary HIV counselling and testing services in Kenya. *Sexually Transmitted Infections*, 83, 541–546.
- Asiimwe, S., Muganzi, E., Tumwesigye, E., Achom, M., & Tappero, J. (2007, July). *Door-door home-based VCT reveals high HIV incidence among HIV-discordant couple members, Uganda*. 4th IAS Conference on Pathogenesis, Treatment and Prevention, International AIDS Society (IAS), Sydney, Australia.
- Bateganya, M.H., Abdulwadud, O.A., & Kiene, S.M. (2007). Home-based HIV voluntary counseling and testing in developing countries. *Cochrane Database of Systematic Review* 2007. doi:10.1002/14,651,858.CD0, 06,493.pub2
- Buvé, A., Bishikwabo-Nsarhaza, K., & Mutangadura, G. (2002). The spread and effect of HIV-1 infection in sub-Saharan Africa. *The Lancet*, 359, 2011–2017.
- Bwambale, F.M., Ssali, S.N., Byaruhanga, S., Kalyango, J.N., & Karamagi, C. (2008). Voluntary HIV counseling and testing among men in rural western Uganda: Implications for HIV prevention. *BMC Public Health*, 8, 263.
- Cremin, I., Nyamukapa, C., Sherr, L., Hallet, T.B., & Cauchemez, S. (2009). Patterns of self-reported behaviour change associated with receiving voluntary counselling and testing in a longitudinal study from Manicaland, Zimbabwe. *AIDS Behavior*, 14(3), 708–715.
- D’Agostino, R.B., Sullivan, L.M., & Beiser, A.S. (2006). *Introductory applied biostatistics*. Belmont, CA: Thomson Brooks/Cole.

- Efficacy Study Group. (1995). *AIDSCAP/WHO/CAPS Counseling and Testing Efficacy Study: C & T baseline instrument*. Retrieved from <http://www.caps.ucsf.edu/tools/surveys/pdf/baseline%20C&T.pdf>
- Efficacy Study Group. (2000). Efficacy of voluntary HIV-1 counselling and testing in individuals and couples in Kenya, Tanzania, and Trinidad: A randomised trial. *The Lancet*, 356, 103–112.
- FHI. (2005). *Service delivery models for HIV counseling and testing*. Retrieved from <http://www.fhi.org/NR/rdonlyres/enjg3dojredmsbucesa6ey2i2wbz3erszczmhj16pz62ogzln4guyeffb4kk2egibf6p5oafwg3k/ModelsofCT2pager122706.pdf>
- FHI. (2006). In T. Rehle, T. Saidel, S. Mills, R. Magnani & B.A. Rodgers, (Eds.), *Evaluating programs for HIV/AIDS prevention and care in developing countries: A handbook for program managers and decision makers*. (Chapter 6, pp. 87–89). Arlington, VA: Family Health International.
- Fishbein, M. (2000). The role of theory in HIV prevention. *AIDS Care*, 12(3), 273–278.
- Fylkesnes, K., & Siziya, S. (2004). A randomized trial on acceptability of voluntary HIV counseling and testing. *Tropical Medicine and International Health*, 9(5), 566–572.
- Inciardi, J.A., Surratt, L., Kurtz, S.P., & Weaver, J.C. (2005). The effect of serostatus on HIV risk change among women sex workers in Miami, Florida. *AIDS Care*, 17(1), S88–S101.
- Irungu, T.K., Varkey, P., Cha, S., & Patterson, J.M. (2008). HIV voluntary counselling and testing in Nakuru, Kenya: Findings from a community survey. *HIV Medicine*, 9, 111–117.
- Kabiru, C.W., Luke, N., Izugbara, C.O., & Zulu, E.M. (2010). The correlates of HIV testing and impacts on sexual behavior: Evidence from a life history study of young people in Kisumu, Kenya. *BMC Public Health*, 10, 412.
- Kamali, A., Quigley, M., Nakiyingi, J., Kinsman, J., Kengeya-Kayondo, J., Gopal, R., ... Whitworth, J. (2003). Syndromic management of sexually-transmitted infections and behaviour change interventions on transmission of HIV-1 in rural Uganda: A community randomised trial. *The Lancet*, 361, 645–652.
- Kipp, W., Kabagambe, G., & Konde-Lule, J. (2002). HIV counselling and testing in rural Uganda: Communities' attitudes and perceptions towards an HIV counselling and testing programme. *AIDS Care*, 14(5), 699–706.
- Kirungi, W.L., Musinguzi, J., Madraa, E., Mulumba, N., Calleja, T., Ghys, P., & Bessinger, R. (2006). Trends in antenatal HIV prevalence in urban Uganda associated with uptake of preventive sexual behaviour. *Sexually Transmitted Infections*, 82, i36–i41.
- Lifshay, J., Nakayiwa, S., King, R., Reznick, G.O., Katuntu, D., Batamwita, R., ... Bunnell, R. (2009). Partners at risk: Motivations, strategies, and challenges to HIV transmission risk reduction among HIV-infected men and women in Uganda. *AIDS Care*, 21(6), 715–724.
- Matovu, J.K., Gray, R.H., Kiwanuka, N., Kigozi, G., Wabwire-Magen, F., Nalugoda, F., ... Wawer, M.J. (2007). Repeat voluntary HIV counseling and testing (VCT), sexual risk behavior and HIV incidence in Rakai, Uganda. *AIDS Behaviour*, 11, 71–78.
- Ministry of Health. (2003). *Uganda National Policy Guidelines for HIV Counselling and Testing*. Kampala: S.A.C. Programme, Ministry of Health.
- Ministry of Health. (2005a). *HIV counselling and testing: A national counsellor training manual*. Kampala: Government of Uganda.
- Ministry of Health. (2005b). *Uganda national policy guidelines for HIV counselling and testing*. Kampala: S.A.C. Programme, Ministry of Health.
- MOH. (2006). *Uganda HIV/AIDS Sero-Behavioural Survey 2004–2005*. Kampala: Ministry of Health and ORC Macro.
- MOH & ORC Macro. (2006). *Uganda HIV/AIDS Sero-behavioural Survey 2004–2005*. Calverton, MD: Author.
- Mola, O.D., Mercer, M.A., Asghar, R.J., Gimbel-Sherr, K.H., Gimbel-Sherr, S., Micek, M.A., & Gloyd, S.S. (2006). Condom use after voluntary counselling and testing in Central Mozambique. *Tropical Medicine and International Health*, 11(2), 176–181.
- Morah, E.U. (2007). Are people aware of their HIV-positive status responsible for driving the epidemic in sub-Saharan Africa? The case of Malawi. *Development Policy Review*, 25(2), 215–242.
- Muller, O., Barugahare, L., Schwartlander, B., Byaruhanga, E., Kataaha, P., Kyeyune, D., ... Ankrah, M. (1992). HIV prevalence, attitudes and behaviour in clients of a confidential HIV testing and counselling centre in Uganda. *AIDS*, 6, 869–874.
- Mulogo, E.M., Abdulaziz, A.S., Guerra, R., & Baine, S.O. (2011). Facility and home based HIV counseling and testing: A comparative analysis of uptake of services by rural communities in southwestern Uganda. *BMC Health Services Research*, 11, 54.
- Pattanaphesaj, J., & Teerawattananon, Y. (2010). Reviewing the evidence on effectiveness and cost-effectiveness of HIV prevention strategies in Thailand. *BMC Public Health*, 10, 401.
- Ryder, R., Batter, V., Nsuami, M., Badi, N., Mundeke, L., Matela, B., ... Heyward, W.L. (1991). Fertility rates in 238 HIV-1-seropositive women in Zaire followed for 3 years post-partum. *AIDS*, 5(1), 1521–1527.
- Sahlu, T., Kassa, E., Agonafer, T., Tsegaye, A., Rinke de Wit, T., Gebremariam, H., ... Fontanet, A.L. (1999). Sexual behaviours, perception of risk of HIV infection and factors associated with attending HIV post-test counselling in Ethiopia. *AIDS*, 13(10), 1263–1272.
- Sangiwa, G., van der Straten, A., Grinstead, O., & VCT Study Group. (2000). Clients' perspective of the role of voluntary counseling and testing in HIV/AIDS prevention and care in Dar Es Salaam, Tanzania: The voluntary counseling and testing efficacy study. *AIDS and Behavior*, 4(1), 35–48.
- Sweat, M., Gregorich, S., Sangiwa, G., Furlonge, C., Balmer, D., Kamenga, C., ... Coates, T. (2000). Cost-effectiveness of voluntary HIV-1 counselling and testing in reducing sexual transmission of HIV-1 in Kenya and Tanzania. *Lancet*, 356(9224), 113–121.

- Turner, N.A., Miller, C.W., Padian, S.N., Kaufman, S.J., Behets, M.F., Chipato, T., . . . Morrison, S.C. (2009). Unprotected sex following HIV testing among women in Uganda and Zimbabwe: Short- and long-term comparisons with pre-test behaviour. *International Journal of Epidemiology*, 38, 997–1007.
- UBOS. (2009). *Statistical Abstract 2009*. Kampala: Author.
- Uganda AIDS Commission. (2008). *UNGASS Country Progress Report Uganda: January 2006 to December 2007*. Kampala: Government of Uganda.
- UNAIDS. (2008). UNAIDS terminology guidelines. Geneva: UNAIDS/WHO.
- Weinhardt, L.S., Carey, M.P., Johnson, B.T., & Bickham, N.L. (1999). Effects of HIV counseling and testing on sexual risk behavior: A meta-analytic review of published research, 1985–1997. *American Journal of Public Health*, 89, 1397–1405.
- WHO. (2007). *Guidance on provider-initiated HIV testing and counselling in health facilities*. Geneva: Author.
- Wolff, B., Nyanzi, B., Katongole, G., Ssesanga, D., Ruberantwari, A., & Whitworth, J. (2005). Evaluation of a home-based voluntary counselling and testing intervention in rural Uganda. *Health Policy Plan*, 20(2), 109–116.