

The dynamics of secondary abstinence among unmarried young people: Analysis of event history calendar data from Kabale and Mukono districts in Uganda

Nazarius Mbona Tumwesigye¹, Roger Ingham², David Holmes³

Abstract:

This article aims to describe the levels of reported secondary abstinence for a period of twelve, six and three months and identify factors associated with discontinuation of abstinence episodes. The data were obtained from 445 sexually active unmarried young people aged between 15 and 24 years from Mukono and Kabale districts using an Event History Calendar. The respondents were randomly selected in a stratified cluster survey. Multivariate logistic regression was used to analyse the probability that an abstinence episode was six or more months long while a piecewise constant hazards model was used to analyse the hazard of episode discontinuation. The analysis shows that in the previous 13 months, 18 percent of sexually active young people abstained for 12 months. The hazard of discontinuation of abstinence episodes reduced greatly after six months and was associated with alcohol consumption, attending parties and discussion with parents. The article concludes that reducing irresponsible alcohol consumption as well as attendance of parties may increase sexual abstinence among unmarried young people.

Key words: *Clustering effect, Cluster sampling, Events history calendar, Sexual abstinence*

Résumé:

Cet article a pour objectif de décrire l'ampleur des abstinences secondaires enregistrées sur une période de douze, six et trois mois et identifier les facteurs de la discontinuité des épisodes d'abstinence. Les données proviennent de 445 jeunes individus non mariés et sexuellement actifs âgés de 15 à 24 ans, munis d'un emploi du temps, dans les districts de Mukono et Kabale. Les individus constituent un échantillon aléatoire extrait d'une enquête sur une population stratifiée. A travers la régression logistique multi variée, l'étude analyse la probabilité qu'un épisode d'abstinence soit longue de six mois ou plus tandis qu'un modèle de fonction constante par intervalle a permis d'analyser la succession des discontinuités des épisodes. L'analyse montre que dans les 13 derniers mois, 18 pourcent des jeunes sexuellement actifs ont observé une période d'abstinence

¹Makerere University Institute of Public Health (e-mail: naz@musph.ac.ug)

²Centre for Sexual Health Research, University of Southampton

³Division of Social Statistics, University of Southampton

We are very grateful to Dr. Padmadas, Sabu for his technical advice while working on material for the paper.

de 12 mois. L'éventualité de discontinuité des épisodes d'abstinence a baissé significativement après six mois ce qui s'explique par la consommation d'alcool, la participation aux fêtes de réjouissance et la discussion avec les parents. L'article conclut que la réduction de la consommation irresponsable d'alcool aussi bien que de la participation aux fêtes de réjouissance pourrait accroître l'abstinence sexuelle chez les jeunes non mariés.

Mots clés: *Effet de grappe, Sondage en grappes, Calendrier des événements historiques, Abstinence sexuelle*

Introduction

Secondary sexual abstinence is one of the recommended ways for prevention of HIV, STDs and unplanned pregnancies among the sexually experienced. However, not much has been written about its level and changes over time among young unmarried people compared to other prevention means. Young unmarried people have unique sexual health problems. They are very vulnerable partly because their social, emotional and psychological development is to varying degrees incomplete, and they tend to experiment with risky behaviour, often seemingly unaware of the consequences.

The level of secondary abstinence among young people aged between 15 and 24 years is generally low. A study in South Africa found that only 16 percent of sexually experienced young people abstained for 12 months in 2002 and 17 percent in 2004. In Uganda, data extracted from the Uganda Demographic and Health Survey (UDHS) showed that 27 percent of women and 34 percent of men aged between 15 and 24 years and unmarried had abstained for the previous twelve months. Given that the study population of the DHS is all those in the reproductive age group, a selection of unmarried aged between 15 and 24 years is bound to create a selection bias. Hence, there is a need for studies focused on this group so that the results obtained can be used to guide programmatic responses in an effort to reduce sexual health related problems.

There is evidence – from various different countries - that reveals that the factors associated with increased secondary abstinence among young people are being female (Erulkar et al. 2004), being older (20-24) (Pettifor, Rees, Steffenson, Hlongwa-Madizikela, MacPhail, Vermaak, & Kleinschmidt 2004), having higher educational attainment (Hallman 2004), higher age at first sex (Langer, Warheit, & McDonald 2001), lower consumption of alcohol (Strunin & Hingson 1992), being religious (Brown et al. 2004), having better communication with parents (Miller, Forehand, & Kotchick

1999) and being in school (Gorgen et al. 1998). Most of the studies on the subject have been carried out in richer countries, whilst some others focus on wider age range. The research described in this paper explored whether the same relationships with secondary abstinence hold amongst young people in Uganda.

Methods and materials

Data on secondary abstinence were obtained from 445 sexually active young people aged between 15 and 24 years. A questionnaire with an attached Event History Calendar (EHC) was used to collect data in a stratified cluster survey in Kabale and Mukono districts in Uganda. The data were reshaped to have records of episodes of abstinence. The clusters were villages. The total number of episodes was 350 from 245 young people. The remainder of the respondents did not abstain for the criterion period of at least one month. Multivariate logistic regression was used to model the probability that an abstinence episode was six or more months long while piecewise constant hazards technique was used to model the hazard of discontinuing an abstinence episode. To make a binary variable for the logistic regression, the length of episodes was categorised into less than six and six or more months.

Two kinds of multivariate models were constructed to identify factors independently associated with secondary abstinence. In the first kind of model, the dependent variable is the probability that an abstinence episode was at least six months long and logistic regression was also applied, but on reshaped data with episodes as observations.

The logistic regression model expressed as a logit of the probability π is

$$\log \frac{\pi}{1-\pi} = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p$$

where

$\beta_1, \beta_2, \dots, \beta_p$ = Coefficients of the predictor variables.

α = Constant

In the second kind of model the data are viewed as discrete and comprise whole months and years. Duration in years or months contain ties especially when it is from recall data. It is difficult to see actual variation if many records tie especially with start and end points of duration of time being analysed. The outcome is the hazard of discontinuing abstinence and the piecewise constant hazard modelling technique is applied.

According to the piecewise constant hazard technique, the data are analysed by first creating dummy variables for particular time duration of abstinence being referenced (D). Then, a logit model is fitted with log odds of discontinuing abstinence as a dependent variable while the time interval dummy variables and predictor factors are independent variables. The details are shown below.

$$\log \frac{h_t}{1 + h_t} = \sum_{t=1}^T \alpha_t D_t + \alpha_1 x_1 + \alpha_2 x_2 + \dots + \alpha_p x_p$$

where

h_t = temporal risk of discontinuation of secondary abstinence or initiating sex

α_t = the baseline hazard at each discrete time or interval, t .

$\alpha_1, \alpha_2, \dots, \alpha_p$ = coefficients for predictor variables

x_1, x_2, \dots, x_p = predictor variables

D_t = the dummy variable indicating the particular duration of time of secondary abstinence.

The assumption in using the piecewise model is that the hazard of discontinuing abstinence was constant within separate intervals of duration of abstinence rather than over the whole length of abstinence episode. The computed duration of abstinence was in discrete numbers which had many ties, and this means Cox's proportional hazards model may leave some information unexplored. Events are tied when two or more individu-

als experience an event at the same time. It is argued that it is more natural to assume a model that reflects discrete time measurement.

Standard model selection techniques were applied in model construction. From a bivariate analysis of each independent variable and abstinence as a dependent variable, a selection of variables with a p-value of less than or equal to 0.20 was carried out and they were included in a multivariate model. Thereafter, the backward elimination technique was used to select the final model. Due to strong relationship between alcohol consumption and attending parties/dances, separate final models each containing one of the variables were constructed.

Results

Figure 1 shows that nearly two thirds of the respondents managed to abstain for three months but slightly less than half abstained for six months while 18 percent abstained for twelve months.

Figure 1: Levels of secondary abstinence in three, six and twelve months

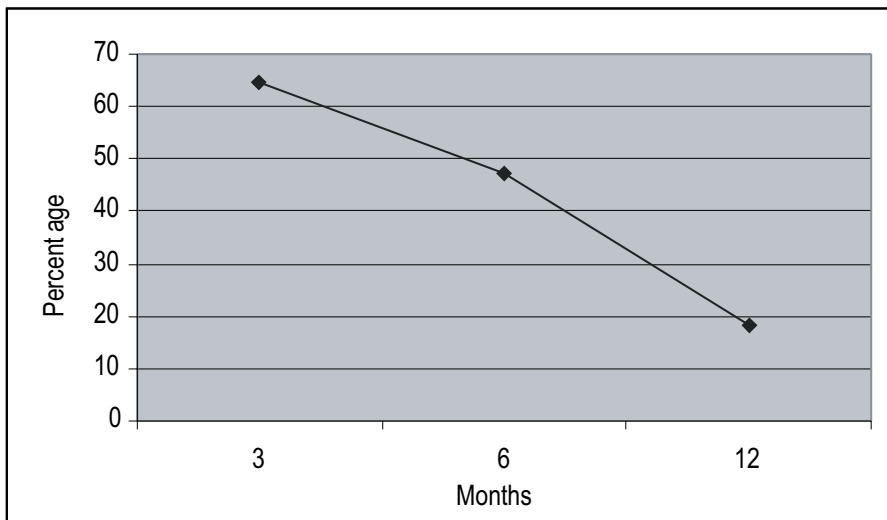


Table 1: Secondary abstinence level by duration using EHC data

Factor	12 month	6 month	3 month
	%	%	%
District	*		
Kabale	22.8	48.4	67.9
Mukono	14.9	46.7	62.1
Gender		**	
Women	18.1	54.8	68.1
Men	18.3	40.9	61.3
Age group	*	***	***
15-16	25.7	65.4	76.2
17-18	20.3	54.5	72.4
19-20	17.3	43.3	60.6
21-22	13.4	29.9	49.3
23-24	6.0	26.0	50.0
Age at first sex	***	***	**
Less than 15 years	29.4	59.4	75.5
15 and above	13.0	41.5	59.2
Residence		*	**
Rural	19.9	51.0	68.4
Urban	14.0	38.8	55.0
In school		**	**
No	17.7	40.0	57.7
Yes	18.7	54.7	71.1
Listens to radio		**	*
No	25.3	62.1	74.7
Yes	16.5	43.9	62.0
Drinks alcohol		*	
No	19.7	51.1	70.0
Yes	14.7	39.0	58.8
Financial support source		*	*
Parents	20.8	51.6	69.7
Self	13.1	36.9	54.9
Relatives/others	18.6	51.0	64.7
Attended party/club last month	*	***	***
No	22.3	47.6	71.7
Yes	12.9	46.7	55.2
Type of partner at first sex	***	**	
Steady	13.4	42.2	61.3
Casual (known)	24.7	62.3	70.1
One time partners	36.4	56.4	74.6
Attitude to abstinence	***	**	*
Low/Medium positive	10.5	40.0	57.9
High positive	24.2	53.1	67.3
Incomplete score†	22.7	52.3	80.6
Condom use at first sex	*		
No	13.8	45.3	62.2
Yes	22.7	49.6	66.8
All	18.2	47.4	64.5

* p <0.05 ** p<0.01 *** p<0.001 † Did not answer all attitude score questions

Table 1 shows the levels of secondary abstinence in three, six and twelve

months for each level of key independent variables. In all levels of each variable there was a decline in abstinence with longer duration of time. A higher proportion of those who resided in Kabale district abstained compared to those in Mukono. This was more evident for duration of 12 months. A higher proportion of women abstained compared to the men and the difference was more evident for six and three months. The level of abstinence significantly varied with age group and age at first sex. The older the respondents were at first sex or at survey time, the higher was the level of abstinence.

The level of abstinence was significantly higher among those who resided in rural areas, were in school, did not listen to radio, did not attend parties or dances, did not take alcohol, had higher positive attitude to abstinence and had non-steady partners at first sex.

Table 2: Modelling abstinence episodes: Logistic regression for a length of six or more months

Variable	Model 1	Model 2
	With alcohol consumption	With attending parties
	OR (95% CI)	OR (95% CI)
District (base = Kabale)		
Mukono	0.61 (0.35-1.07)	0.71 (0.42-1.20)
Gender (base = female)		
Male	0.99 (0.57-1.72)	0.99 (0.57-1.73)
In school (base = no)		
Yes	0.51 (0.27-0.95)*	0.52 (0.28-0.97)*
Type of first sexual partner (base = steady)		
Casual	2.36 (1.09-5.10)*	2.09 (0.95-4.61)
One time	1.37 (0.64-2.93)	1.59 (0.72-3.48)
Drinks alcohol (base = no)		
Yes	0.51 (0.27-0.95)*	
Financial support source		
Self	0.44 (0.20-0.98)*	0.48 (0.21-1.07)
Others	1.68 (0.91-3.11)	1.77 (0.95-3.28)
Discusses with parents (base = no)		
Yes	0.25 (0.06-0.94)*	0.23 (0.06-0.88)**
Attended parties/clubs (base = no)		
Yes		0.38 (0.22-0.66)**
Age at first sex (base = <14 years)		
15 and above	0.70 (0.39-1.25)	0.74 (0.40-1.34)
Goodness of fit		
<i>n</i>	347	347
Number of parameters	10	10
Log Likelihood	-184	181
Log Ratio test for the model	<i>p</i> = 0.002	<i>p</i> < 0.001
% correctly predicted	76	76
Pearson's goodness of fit test	0.12	0.14

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 2 shows the final multivariate logistic regression models for an abstinence episode length of six or more months. The factors independently associated with abstinence for six or more months were not being in school, having a casual or one time only relationship, not talking to parents about sexual matters and avoiding alcohol and parties or dances. The association of abstinence with not being in school and communication with parents is contradictory to the results from other studies. A closer examination of the length of the episodes found that those in school had a longer first episode but shorter subsequent episodes which could be a result of school and holiday times. Regarding discussion with parents, it is possible that young people talk to parents *after* discontinuation of abstinence episodes. It is also possible that the relationship may be due to a small proportion

(9 percent) that discusses sexual issues with their parents. The same analysis was run for episode lengths of twelve months and similar results were obtained.

Before adjusting for cluster (village level) effects

Table 3 shows the results of the piecewise constant hazard model before adjusting for possible cluster effects. According to the table, the factors associated with discontinuation of secondary abstinence were being in school, being in a steady relationship, taking alcohol, attending parties and talking to parents about sexual matters. Being self-reliant was marginally significantly associated with discontinuation. A larger confidence interval for talking to parents is due to a small proportion that had ever talked to parents. Other factors including the order of the episode, type of school, access to media, religion and religiosity, and experience of indecent assault were not significant. The two models show similar patterns although the second one (with attending parties) has a higher predictive value.

Table 3: Piecewise constant hazard logistic regression models for discontinuation of abstinence episode unadjusted for village effect

Variable	Model 1	Model 2
	With alcohol consumption	With attending parties
	OR (95% CI)	OR (95% CI)
District (base = Kabale)		
Mukono	1.41 (0.89-2.24)	1.06 (0.69-1.62)
Gender (base = female)		
Male	0.90 (0.61-1.32)	0.87 (0.59-1.29)
In school (base = no)		
Yes	1.90 (1.18-3.06)*	1.78 (1.11-2.85)*
Type first sexual partner (base = steady)		
Casual	0.44 (0.23-0.85)*	0.50 (0.26-0.98)*
One time	0.91 (0.55-1.49)	0.83 (0.50-1.36)
Drinks alcohol (base = no)		
Yes	2.18 (1.41-3.38)***	
Discusses with parents (base = no)		
Yes	3.23 (1.52-6.89)**	2.97 (1.38-6.40)*
Attended party/club last month (base = no)		
Yes		2.17 (1.47-3.20)***
Resides with (base = both parents)		
Single parents	1.32 (0.79-2.18)	1.33 (0.80-2.21)
Grandparents and others	1.38 (0.79-2.39)	1.66 (0.94-2.94)
Financial support source (base = both parents)		
Self	1.74 (0.98-3.08)	1.49 (0.84-2.64)
Others	0.54 (0.30-0.97)*	0.45 (0.25-0.82)*
Attitude towards abstinence (base = Low/medium)		
High positive	0.69 (0.46-1.04)	0.67 (0.45-1.01)
Incomplete score†	1.22 (0.69-2.15)	1.03 (0.58-1.82)
Length of abstinence in Months (base =1-2)		
3-4	0.85 (0.56-1.29)	0.87 (0.57-1.32)
5-6	0.82 (0.47-1.42)	0.84 (0.48-1.46)
7-8	0.40 (0.17-0.93)*	0.42 (0.18-0.97)*
9-10	0.16 (0.04-0.70)*	0.18 (0.04-0.77)*
11-13	0.21 (0.05-0.91)*	0.23 (0.05-0.98)*
Goodness of fit		
<i>n</i>	842	842
Number of parameters	18	18
Log Likelihood	-379	-377
Log Ratio test for the model	<i>p</i> <0.001	<i>p</i> <0.001
% correctly predicted	81	80
Pearson's goodness of fit test	0.18	0.55

* *p* <0.05 ** *p* <0.01 *** *p* <0.001 † Did not answer all attitude score questions

Both models show that being in school increases the hazard of discontinu-

ing an abstinence episode by nearly 90 percent. Those who discussed with parents about sexual matters were three times more likely to discontinue abstinence compared to those who did not. Attending parties put young people at more than twice as much risk of discontinuing abstinence as those who did not attend parties. Abstaining for more than 10 months reduces the hazard of discontinuing to a fifth of the hazard in the first two months.

The goodness of fit statistics show high predictive ability of the models. However, the Pearson's goodness of fit p-value is low in the model with alcohol consumption but high in the model with attending parties. Hence the second model is more robust.

After adjusting for cluster (village level) effects

Table 4 shows results of the piecewise constant hazard model adjusted for village level effects. The variables being in school, drinking alcohol, discussing with parents and source of financial support had a similar association with the hazard of discontinuing abstinence as in the previous model (before adjusting for random effects). The length of abstinence and type of first sexual partner are no longer strong factors in determining the hazard of discontinuation after controlling for village level random effects. The rural/urban residence, district, education level, religion, alcohol consumption, length of stay at place of residence, experience of indecent assault and attitudes to sexual abstinence were not related to the hazard of discontinuing secondary abstinence.

Table 4: Piecewise constant hazard models for discontinuation of ab-

stinence episodes adjusted for village level effects

Variable	Model 1	Model 2
	With alcohol	With attending parties
District (base = Kabale)		
Mukono	1.59 (0.98-2.56)	1.21 (0.78-1.87)
Gender (base = female)		
Men	0.82 (0.53-1.26)	0.82 (0.53-1.27)
In school (base = no)		
Yes	1.89 (1.13-3.15)*	1.73 (1.04-2.88)*
Drinks alcohol (base = no)		
Yes	2.43 (1.51-3.91)***	
Financial support source (base = both parents)		
Self	2.06 (1.12-3.80)*	1.84 (1.00-3.38)*
Relatives/Other	0.68 (0.40-1.17)	0.62 (0.36-1.07)
Discusses with parents (base = never/occasionally)		
Often	3.05 (1.35-6.89)**	3.05 (1.33-6.95)**
Attended party/club last month (base = no)		
Yes		2.46 (1.62-3.75)***
Length of abstinence (base = 1-2 months)		
3-4	0.96 (0.63-1.47)	1.00 (0.65-1.53)
5-6	0.98 (0.57-1.68)	1.02 (0.59-1.77)
7-8	0.52 (0.24-1.14)	0.56 (0.26-1.23)
9-10	0.22 (0.06-0.79)*	0.24 (0.07-0.88)*
11-12	0.29 (0.08-1.08)	0.31 (0.09-1.16)
Random effects		
$\sigma^2 / \text{se}(\sigma^2)$ [t statistic for village effect]	0.45/0.20*	0.47/0.20*
Goodness of fit		
Person years	844	844
Number of parameters	12	12
-2LL	655	660

* p < 0.05 ** p < 0.01 *** p < 0.001

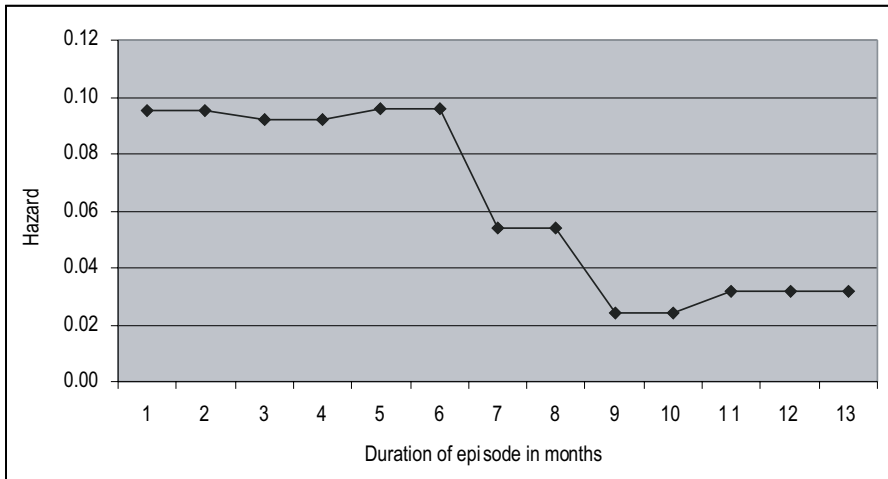
The random effects at the village level were significant at the 5 percent level. The effects at the parish level were not significant. The variance of the random effects at the village level shown in the second model of Table 4 mean that if a village in Kabale has one standard deviation of log hazard of discontinuing an abstinence episode, then a woman in the village who is not in school, does not attend parties, is supported by parents, does not discuss sexual matters with the parents will be having twice as much hazard (exponential of the square root of 0.47) of discontinuing abstinence compared to one in a village with an average risk. Both models show a similar

pattern and have nearly the same likelihood.

Figure 2 shows that the hazard of discontinuing an abstinence episode, after controlling for other factors, started declining greatly after 6 months. The same trend is observed among alcohol drinkers and non-drinkers in Figure 3 although the hazard was consistently higher among drinkers than among non-drinkers.

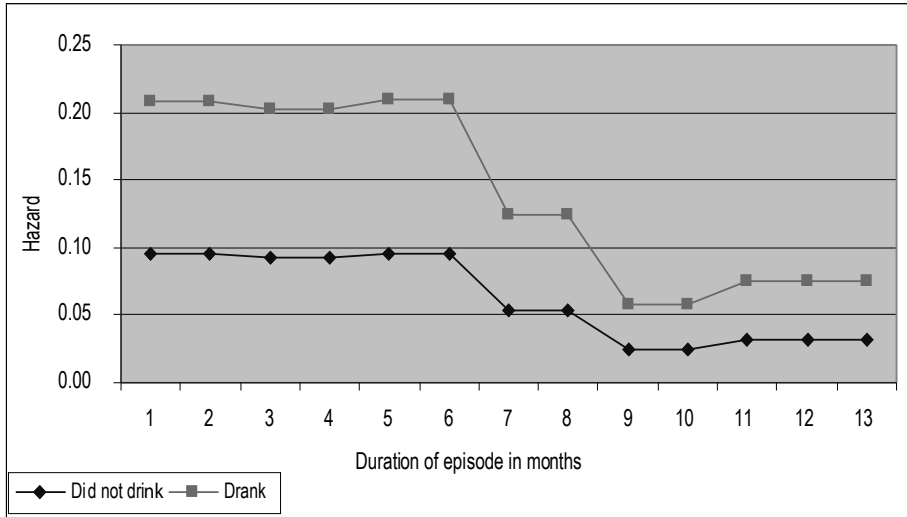
Figure 2: The hazard of discontinuing an abstinence episode by duration assuming base value on all covariates

Figure 3: The hazard of discontinuing an abstinence episode among



alcohol drinkers and non-drinkers after controlling for other factors

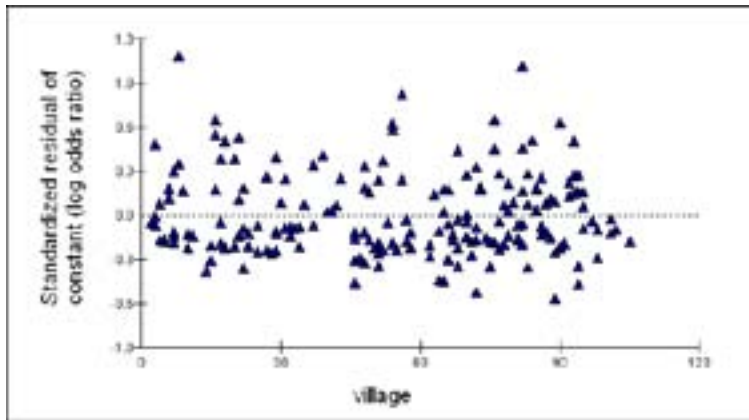
Figure 4 presents the variation in hazard of discontinuation by village. The



dispersion in hazard of discontinuation is more among villages with higher average hazard (compared to an average village) than those with lower average hazard. This implies that in those villages where the risk of discontinuing abstinence is more than average the likelihood of discontinuation varies between villages more than that in villages with a lower risk of discontinuation. Two villages had extreme hazard of discontinuation that was more than one standard deviation higher than that of an average village.

Figure 4: Village level random effects on discontinuation of abstinence

episodes



Discussion

The results above have shown that the levels of secondary abstinence are low and they increase with shorter duration of time as expected. The factors independently associated with episode length of six or more months were not being in school, having had casual/one time relationship at first sex, not taking alcohol, not talking to parents about sexual matters and avoiding parties. In a more analytical approach with a multivariate piecewise logit model, the only factors independently and strongly associated with the hazard of discontinuation of abstinence episode were taking alcohol, attending parties and talking to parents about sexual matters. At the 5 percent level of significance, being in school, having had a steady relationship at first sex and relying on other people other than parents for financial support were also significantly associated with the hazard of discontinuation. The hazard of discontinuation of abstinence significantly reduced with duration with a marked drop after six months and varied by village.

With less than a fifth of sexually active young people abstaining for 12 months, it is difficult to think that abstinence-only programmes will be effective in Uganda as believed by some policy makers and programme managers. The proportion that can or does not abstain is large and yet abstinence campaigns have been running for a long time. Therefore, condom use should be promoted by all possible means.

The likelihood of secondary abstinence was significantly higher among those who were young compared to the older respondents. This differs from the findings reported in Pettifor *et al.* (2004) in South Africa where

secondary abstinence level increased with age. However, in a multivariate analysis of episodes including the hazard of discontinuation of an abstinence episode, age was not found to be significant.

Higher age at first sex was associated with higher likelihood of abstinence but only in the bivariate analysis. It was not independently associated with secondary abstinence.

The association of not being in school and lower likelihood of abstaining for at least six months is similar to results in Gorgen *et al.* (1998) in Guinea. Higher likelihood of abstaining for at least six months, and higher hazard of discontinuing abstinence among those in school compared to those not in school, shows that those in school may abstain for at least six months but easily discontinue thereafter. This is probably due to holiday and school times of the students. For those in school there is one long episode followed by several small ones since their first episodes were longer than the episodes of those who were not in school. Higher level of education and type of school attended were not significantly associated with secondary abstinence.

Listening to radio was associated with the likelihood of abstaining for at least six months but it did not have an independent association with the hazard of discontinuing an abstinence episode.

Religiosity as measured by the frequency of attending religious services was not significantly associated with secondary abstinence in the current study. This differs from findings in Ku *et al.* (1998) in a study of sexually active young people in the USA, where the more religious were more likely to abstain.

Consumption of alcohol was not independently associated with a specific duration of abstinence but it contributed significantly to the hazard of discontinuing abstinence episodes. This is in agreement with other findings, such as those reported in Strunin and Hingson (1992).

The significance of reliance on parents for financial support as a protective measure against secondary abstinence may lie in a number of factors. It is a proxy variable for socio-economic status (SES) of the family because it is the well-to-do that can afford to financially support their children until

they can be on their own. Hallman (2004) indicated that low SES reduced the likelihood of secondary abstinence in a study in South Africa. Another factor could be that, because the parents support their children financially, they exert some control over them, such as not allowing them to go for dances or to drink alcohol. These two factors are known to be associated with discontinuation of abstinence episodes.

Attending dancing parties/clubs in Uganda was also connected to discontinuation of sexual abstinence in a qualitative study carried out in Uganda. This variable has also been associated with initiation of sexual intercourse (Tumwesigye, 2006). This could be associated with alcohol consumption at the parties.

Whereas experience of indecent assault and strong positive attitude towards sexual abstinence were significantly associated with primary abstinence (Tumwesigye, 2006), they were not independently associated with secondary abstinence.

The positive association of communicating with parents and discontinuation of secondary abstinence is unique. In Miller *et al.* (1999) and other publications it is shown that communicating with parents reduces the risk of sexual activity. In the current study, however, it is the opposite. As this is not a prospective or quasi-experimental study it is not possible to determine what comes before the other, discussion with parents or discontinuation of abstinence episodes. In other words, it could be that parents' awareness of their child's sexual activity leads to discussions on sexual matters.

Higher hazard of discontinuation in first six months of abstinence episodes may be explained by seasonality of sexual activity. There seem to be months of high and low sexual activity, related to seasons. Qualitative data collected for the same study found that harvest and post harvest times were full of activities that predisposed young people to sexual activity (Tumwesigye, 2006).

Village level random effects on abstinence level may be due to differences in exposure to risky factors, such as local norms. This needs further investigation.

Conclusions and implications

There are behavioural and socio-economic factors that are associated with the likelihood of abstinence and the hazard of discontinuing abstinence. Some of the factors are influential in both outcomes while others are significant in just one of them.

Different approaches to analysis of the event history data brings out different factors correlated with sexual abstinence.

Significant variation of abstinence at village level calls for controlling for cluster structure of the data when analysing data on sexual abstinence or sexual activity in the country. This raises questions about the precision of estimates in previous analyses of data in the country where data were collected using cluster sampling and no adjustment was made for the clustering effect.

Programmes promoting abstinence should look into ways of discouraging young people from irresponsible alcohol consumption and possibly finding out why they are drinking.

More research is needed as the findings on higher hazard of discontinuing abstinence among those who are in school and those that discuss sexual matters with their parents cannot be fully explained from previous published studies. Another area for further research is the unexplained cluster level random effects on sexual abstinence.

References

Asimwe, D., Kibombo, R., & Neema, S. (2003) *Focus Group Discussion on Social Cultural Factors impacting on HIV/AIDS in Uganda*, Ministry of Finance, Planning and Economic Development/UNDP, Kampala, Uganda.

Brown, L., Karim, A. M., Hutchinson, P., Agha, S., MacIntyre, K., & Magnani, R. (2004). Church and clubs: Influence on secondary abstinence in KwaZulu-Natal, South Africa 1999-2001, paper presented at the annual conference of the Population Association of America, held in Princeton, USA.

Erulkar, A., Ettyang, L. I. A., Onoka, C., Nyaga, F. K., & Muyonga, A. (2004) Behavior Change Evaluation of a Culturally Consistent Reproductive Health Program for Young Kenyans, *International Family Planning Perspectives*, 30 (2), 58-67.

Gorgen, R., Yansane, M. L., Marx, M., & Millimounou, D. (1998) Sexual

Behavior and Attitudes Among Unmarried Urban Youths in Guinea, *Family Planning Perspectives*, 24 (2) 65-71.

Hallman, K. (2004) *Socioeconomic disadvantage and unsafe sexual behaviours among young women and men in South Africa*. New York. No. 190. Population Council.

Hosmer, D. W. & Lemeshow, S. (2000) *Applied Logistic Regression* John Wiley and Sons, New York.

HRW (2005) *Findings on abstinence education in Uganda*, Human Rights Watch, New York.

Kiragu, K. (2001) *Youth and HIV/AIDS: Can we avoid catastrophe?*, The Johns Hopkins University Bloomberg School of Public Health, Population Information Program, Baltimore, XXIX.

Langer, L. M., Warheit, G. J., & McDonald, L. P.(2001) Correlates and Predictors of Risky Sexual Practices among a Multi-Racial/Ethnic Sample of University Students”, *Social Behaviour and Personality: An international Journal*. 29 edn, 133-144.

Miller, K. S., Forehand, R., & Kotchick, B. A. (1999) Adolescent sexual behaviour in two ethnic minority samples: The role of family values, *Journal of Marriage and the Family*, 61(1),85-98.

Pettifor, A. E., Rees, H. F., Steffenson, L., Hlongwa-Madizikela, MacPhail, C., Vermaak, K., & Kleinschmidt, I. (2004) HIV and sexual behaviour among young South Africans: a national survey of 15-24 year olds. Johannesburg: Reproductive Health Research Unit, University of Witwatersrand.

Shisana, O. & Simbayi, L. C. (2002), *Nelson Mandela/HSRC Study of HIV/AIDS: South African HIV prevalence, Behavioural, Risks and Mass Media*, Human Sciences Research Council, Cape Town.

Strunin, L. & Hingson, R. (1992) Alcohol, drugs, and adolescent sexual behavior, *International Journal of the Addictions*, 27 (2) 129-146.

Tumwesigye, N. M (2006), *Dynamics of abstinence and condom use among unmarried youth aged 15-24 in Uganda a case of Mukono and Kabale districts*. A thesis submitted for degree of PhD, Division of Social Statistics,

University of Southampton

Yamaguchi, K. (1991) *Event History Analysis*, Sage Publications, Newbury Park, CA.