Risk of HIV infection among married women in Zimbabwe: Does living arrangement really matter?

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Introduction

Zimbabwe lies in Southern Africa which is a sub region of Sub-Sahara Africa, and currently the sub region is believed to be the epicentre of HIV pandemic (Gregson *et al*, 2010: Ndlovu, 2004). National HIV prevalence rate is at 15% according to the latest Demographic and Health Survey (Ncube, 2013). However the scale of the epidemic at country level reflects its widely disseminated nature by characteristics like socio-economic status and geographical locations (Gregson et al, 2010). Also included among such characteristics is marriage which is a cultural distinctive feature among many societies. The practice is highly revered in Zimbabwe especially among women, as indicated by higher percentages of those in marriage, i.e. about 62% of all women of reproductive age (Zimbabwe National Statistics Agency, 2011). This is despite reported upsurge in incidence of both intimate partner violence and divorces in Zimbabwe. According to research marriage remains a significant social, cultural and economic way in which people give meaning to their lives (Reddy, 2011).

With the advent of HIV pandemic the institution of marriage has drawn the attention of researchers particularly in Southern Africa, as they attempt to identify likely drivers of the pandemic in this sub region of Africa. However, in so doing, researchers have largely focused on broader associations between marital status and HIV infection. The risk of infection within marriage has not been much explored yet suggestions are that the risk is very high in marriage (Njororai, 2009). A study in India suggested that women in monogamous marriage comprise 40% of HIV positive individuals. (Gupta, 2011). Through practices like migration, living conditions in marriage are likely to be altered, and this may partly result in living arrangements that heighten engagement in risky behaviours and consequently HIV infection, as further noted by the same source. The influence of living arrangement i.e. co-residing or none co-residing with partner on HIV infection within marriage is a research gap that has been rarely explored. In this study, co-residing refers to married individuals living under one roof, and none co-residing to married individuals living separately as at time of the survey. The objective of this study was therefore to investigate the influence of living arrangement on HIV infection among married women in Zimbabwe, by testing this association.

There is well documented evidence that Zimbabwe has experienced migrations over time (Zanamwe and Devillard, 2009; Crush *et al*, 2009). These have ranged from internal migrations

particularly rural to urban, circular migrations that have been predominantly within Southern Africa, and of recent international migrations due economic hardships the country has been facing. The effect of these migrations in altering living arrangements among married individuals especially through spousal separation is believed to have been substantial (Dean *et al,* 2010). However, investigating the effect of migration on living arrangement shall fall beyond the scope of this study.

The basis of our argument is that; estimated high volumes of migrations both internally and internationally over time among Zimbabweans have significantly led to increase in number of none co-residing partners at different points in time. Such a form of living arrangement, especially if it persists over longer durations of time is likely to increase exposure to HIV infection through high risk behaviours (Gupta, 2011). Poor spousal monitoring due to spousal separation largely creates conducive environment that allows the practice of such risk behaviours like multiple sexual partnerships (Gregston *et al*, 2007). HIV transmissions to spouses back home would therefore be understood in the context of "risk transfer"; i.e. transmission of AIDS virus from migrating partner to the partner remaining at home. We therefore hypothesised that the likelihood of being infected with the HIV virus should be higher among none co-residing women relative to those who are co-residing (Brummer, 2002).

Data Sources and Methods

We used Zimbabwe Demographic Health Survey (DHS) data of 2005-06 and 2010-11. The 2005-06 DHS was collected between August 2005 and March 2006, and the 2010-11 DHS between August 2010 and March 2011 The two are the first complete national surveys to conduct an HIV test in Zimbabwe. This partly influenced the selection of the data for this study. Secondly, our study was at national level and use of these nationally representative data allowed generalisation of our findings to entire population of women in the reproductive age group. Use of the two latest DHS data sets was one way of increasing robustness of the investigation. . In both surveys sampling frame used was the Zimbabwe Master Sample (ZMS02) that was developed by Central Statistical Office (CSO) of Zimbabwe guided by population count from 2002 census.

HIV status was the outcome variable, coded as yes for those who tested positive and no for those who were negative. Main explanatory variable was living arrangement, and it also had a binary outcome i.e. either co-residing, or none co-residing. We used the variable: Currently residing with partner, which was categorised as either yes or no, to come up with the binary categorization of our main explanatory variable. Those reporting yes to currently residing with partner were categorised as coresiding women; those reporting no, were categorised as none coresiding. Co-residing or none co-residing with partners in this study is as was reported by the time of the surveys. Control variables were; education, wealth status, place of residence, religion, condom use, sexual exclusivity, and occupation

For descriptive statistics, cross tabulations were used to identify patterns and levels of HIV distributions according to living arrangement. For analytic statistics binary logistic regression was used for both bivarite and multivariate analyses. Two models were produced at multivariate

analysis. Model 1 investigated the influence of living arrangement on HIV infection using 2005-06 data, whereas model 2 used 2010-11 data. In both models control variables were the same as already identified above. Confidence intervals (CIs) were used to determine both; significance of associations and preciseness of odds ratios (ORs). P-values complemented CIs in determining extent of level of significance. We set our alpha at 0.05 and CI at 95%.

Results

Descriptive statistics

Among none co-residing women HIV prevalence was 19.1% compared to 16.9% for co-residing women, using 2005-06 DHS (Fig 1). Based on the same data, even when looking at the profile of these women through selected characteristic such as wealth, education, religion and others, suggestions are still that prevalence of HIV is higher among none co-residing women than those co-residing (Table 1). However, findings from 2010-11 DHS data contrast those stated above. HIV prevalence was slightly lower for none co-residing women compared to that of co-residing women, 16.4% and 18.6% respectively (Fig 1). The pattern was also confirmed in the profile analysis of the respondents through same characteristics (Table 1)

Fig 1 HIV prevalence by living arrangement: 2005-06 & 2010-11

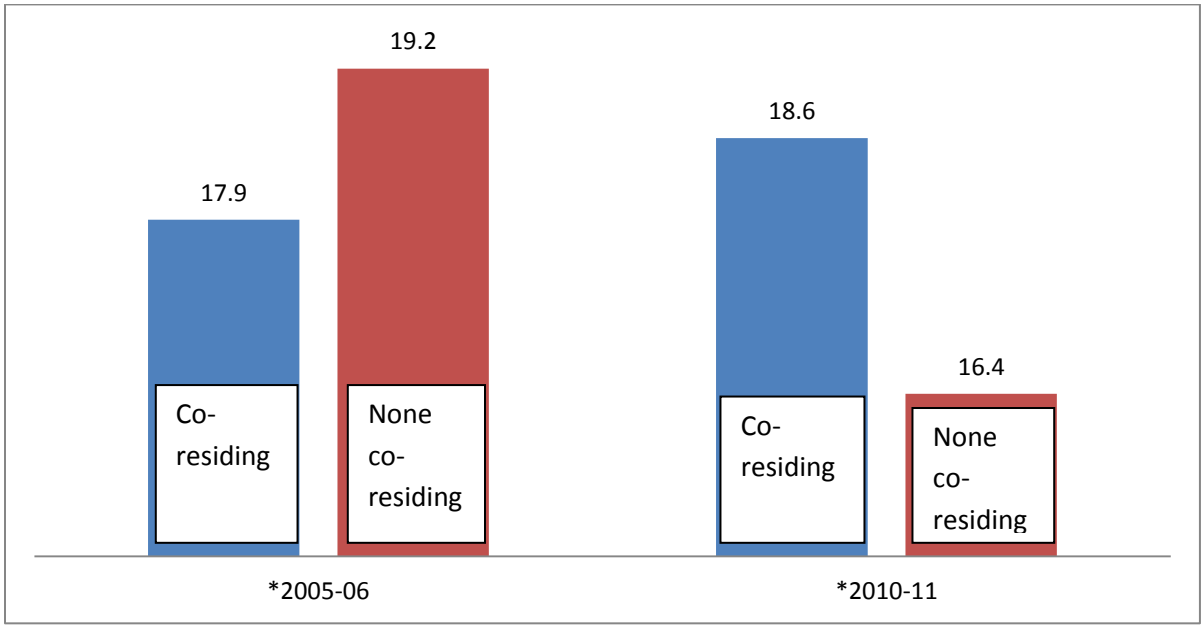

Table 1 HIV distribution by living arrangement & other characteristics 2005-06 & 2010-11

Characteristics	% of respondents by characteristic		Co-residing % HIV positive		None Co-residing % HIV positive	
	2005-06	2010-11	2005-06	2010-11	2005-06	2010-11
Wealth Status Poor	47.98	40.7	16.4	17.9	19.21	14.1

Medium	18.26	18.0	17.24	17.5	17.87	18.8
Rich	33.76	41.3	21.03	19.6	21.27	17.5
Educational Level						
No education	36.26	16.6	14.15	19.6	20.26	15.6
Primary	61.00	78.3	20.67	18.4	18.92	16.7
secondary &above	13.74	5.10	13.64	19.6	11.54	14.0
Religion						
Traditional	17.5	15.13	8.9	26.5	10	21.1
Christianity	67.0	71.0	18.2	18.4	19.63	16.1
Islam and others	15.5	13.87	15	23.0	14.29	19.3
Age						
15-24 years	38.62	28.3	13.87	16.6	15.85	17.7
25-34 years	45.60	41.5	22.51	19.3	21.24	15.9
35-49 years	15.78	30.3	13.53	19.6	20.97	15.8
Place of Residence						
Urban	25.54	32.6	20.36	19.1	17.29	16.8
Rural	74.46	67.4	17.13	18.4	19.44	16.3
Condom Use						
No	45.54	12.6	16.67	18.4	14.24	17.4
Yes	54.46	87.4	19.04	18.9	23	16.8
Sexual exclusivity						
No	55.26	20.1	18.84	20.4	20.98	10.6
yes	44.74	79.9	16.93	18.5	16.62	17.1

Bivariate Analysis

From both 2005-06 and 2010-11 data sets there was no significant association between living arrangement and HIV infection. The direction of flow for the former suggested none co-residing women had 1.08 higher odds of HIV infection than co-residing women (Table 2). The preciseness of the odds ratio obtained was quite high as suggested by a tight confidence interval. However, the direction of flow changed when the analysis was done using 2010-11 data. None co-residing had 0.85 lower odds of HIV infection compared to co-residing women (Table 2). Confidence interval was also quite precise. When using 2005-06 data other associated variables were significant save for place of residence, while none was significant when using 2010-11 data except for religion

Table 2 Crude effects of living arrangement and other characteristics: 2005-06

Characteristic	**2005-06**		**2010-11**	
	Crude ORs	**CI**	**Crude ORs**	**CI**
Living arrangement	RC		RC	
Co-residing	1.08	0.89;1.30	0.85	0.71;1.03
none co-residing				

Wealth Status				
poor	RC		RC	
medium	1.20	0.99;1.45	1.20	0.96;1.39
rich	1.30	1.11;1.53**	1.12	0.97;1.29
education Level				
no education	RC		RC	
primary	1.26	1.08;1.46**	0.94	0.78;1.13
secondary +	0.67	0.39;1.18	0.96	0.71;1.32
Religion				
Traditional rel	RC		RC	
Christianity	2.44	1.49;4.00***	0.67	0.36;1.26
Islam and others	1.76	0.61;5.15	1.48	0.52;4.22
Age				
15-24 years	RC		RC	
25-34 years	1.77	1.51;2.07***	1.12	0.97;1.31
35-49 years	1.27	1.02;1.60*	1.06	0.91;1.25
Place of residence				
urban	RC		RC	
rural	0.91	0.77;1.07	0.98	0.86;1.12
Condom use				
no	RC		RC	
yes	1.35	1.16;1.55***	1.04	0.86;1.27
Sexual exclusivity				
no	RC		RC	
yes	0.77	0.67;0.89***	1.03	0.79;1.30

P<0.001***, p-value<0.010**, p-value<0.050* , rel = religion

Multivariate analysis

After controlling for other associated characteristics, the association of interest for this study remained insignificant in both models (Table 4). In model 1, odds ratios further increased to 1.11 for none co-residing women, suggesting an 11% higher likelihood of being HIV infected for these women relative to women co-residing. The preciseness of the ORs remained very high as suggested once again by a tight CI. All characteristic which were significant at bivariate remained so when analysed at multivariate level. In model 2, none co-residing women had 11% less likelihood of having HIV infection compared to co-residing women. Again suggestions are that ORs obtained are quite precise. Religion remained the only significant characteristic in this model.

Table 3 Adjusted effects of living arrangement

Characteristics	**Model 1(2005-06)**		**Model 2 (2010-11)**	
	OR	CI	OR	CI

Living arrangement				
Co-residing	RC		RC	
None co-residing	1.11	0.90;1.36	0.89	0.73;1.09
Wealth status				
Poor	RC		RC	
Medium	0.91	0.70;1.19	1.05	0.81;1.34
Rich	1.65	1.22;2.23**	1.18	0.91;1.54
Education level				
No Education	RC		RC	
Primary	1.31	1.06;1.63*	0.93	0.72;1.20
Secondary & above	0.63	0.33;1.22	0.91	0.59;1.44
Religion				
Traditional	RC		RC	
Christianity	2.07	1.15;3.73*	0.44	0.21;0.90*
Islam & others	1.72	0.50;5.82	1.05	0.31;3.57
Age				
15-24 years	RC		RC	
25-34 years	1.75	1.42;2.15***	1.10	0.88;1.36
35-49 years	1.36	1.01;1.82*	1.12	0.89;1.41
Place of residence				
urban	RC		RC	
rural	1.38	1.08;1.57	1.05	0.82;1.35
Condom use				
No	RC		RC	
Yes	1.30	1.26;1.90**	0.97	0.75;1.27
Sexual exclusivity				
No	RC		RC	
Yes	0.75	0.62;0.90	0.94	0.63;1.40

Conclusion

Majority of cross sectional studies face challenges of temporality limitations, as already clarified in our discussion. Our study may not have been an exception from this. For example, due to the nature of the data the study could not determine whether the individual who is HIV positive got infected e.g. prior or during the current living arrangement. However, despite such likely limitations, findings obtained from both data sets suggested that living arrangement has no significant association with HIV infection among married women in Zimbabwe. The implications of such findings are that living arrangement doesn't really matter in determining HIV infection among married women in Zimbabwe.

The risk transfer theory has some backing from findings based on 2005-06 data, for even though the association of interest was insignificant, none co-residing women had slightly higher odds of HIV infection compared to co-residing women. However, the theory was none applicable when using the 2010-11 data. For not only was the association insignificant, but the odds of HIV

infection were also lower for none co-residing than co-residing women, though the difference was slight.

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