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Is intimate partner violence associated with HIV among women in Zimbabwe?

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Abstract

Intimate partner violence (IPV) has increasingly become a health problem around the world, and in particular, its association with sexually transmitted diseases such as HIV. Empirical research examining the association between IPV and HIV is very limited, especially in Southern Africa, partly due to data constraints, but there is some evidence that exposure to IPV increases HIV risk. This study investigates the association between intimate partner violence (IPV) and HIV status among Zimbabwean women using data from the 2005/06 Demographic and Health Survey (DHS). Controlling for age, household wealth, education level, age at first sexual intercourse and the number of lifetime sex partners, we find no association between sexual, psychological and physical violence and HIV-status. We also find no statistically significant association between a composite measure of IPV, which combines the above three measures of IPV, and HIV. We conclude that this may be due to two main reasons, the first being that IPV actually has no relationship with HIV-status among Zimbabwean women. The second potential reason for our findings is that the data constraints that prevent us from measuring historical IPV hamstring our efforts to quantify this association. We however call for caution when making blanket claims about the prevalence of IPV among Southern African women, and the strength of the association between IPV and HIV status among them.

Introduction

The most prevalent form of gender violence is the abuse of women by an intimate partner (Tang and Lai, 2008:2; Heise et al., 2002:2). No universal definitions for intimate partner violence (IPV) exist (Anderson et al., 2007:1; Hamburger, 2005), but it can be broadly understood as the use of physical, sexual and/or psychological violence among current or former partners (Arias and Corso, 2005). Physical violence includes slaps, punches, kicks and assaults with a weapon while sexual violence includes rape, coercion, use of physical force, verbal threats and harassment to have sex (WHO, 2005: 2). Psychological violence includes threats to harm the woman or her relatives/friends, withholding resources, preventing her from working or confiscating her earnings (WHO, 2005:2).

IPV is now recognised as a significant public health problem around the globe (Sareen et al., 2010: 2; Affifi et al., 2008; Garcia-Moreno et al., 2006) and one of the areas of concern is the association between IPV and sexually transmitted diseases such as HIV (Raj et al., 2006). Earlier studies have suggested that IPV is associated with increased HIV risk among women, as men who abuse their partners often exhibit riskier sexual practices (Dunkle et al., 2006; Silverman et al., 2008), and that abused women may themselves exhibit higher risk sexual practices later in life (Maman et al., 2000).

In countries where adequate data exist, research has shown a very strong correlation between IPV and HIV. In Rwanda, women who have experienced sexual, physical or emotional abuse within their marriages are between 1.61-3.46 times more likely to test HIV-positive, and 2.14 - 4.11 times more likely to report another STI than those who have not (Dude, 2009). In Soweto, South Africa, Dunkle and colleagues find that women who experience IPV are nearly 50% more likely to be HIV-positive than those who do not (Dunkle et al., 2004). In the United States, Sareen and colleagues find IPV to be strongly associated with HIV infection, with those women who have experienced IPV in the past year 3.44 times more likely to be HIV-positive (Sareen et al., 2009). Another study in India also corroborates the above findings, with married women currently experiencing IPV more likely to be HIV-positive (Silverman et al., 2008).

Despite these strong associations, empirical work in this subject area is still limited, especially in the hyper-epidemic countries in Southern Africa. Most of the limited empirical research in the sub-region is from South Africa and in most cases analyses IPV among high risk groups such as prostitutes but not the general population (Dude, 2009:4). Zimbabwe is one such hyper epidemic

country where adequate data exists, but to the best of our knowledge, no study attempts to quantify the association between IPV and HIV among the general population. This study has one main objective: to examine the association between IPV and HIV infection among a large representative sample of Zimbabwean women. The paper uses the Zimbabwe Demographic Health Survey (DHS) 2005/06, to investigate whether women who have been subjected to IPV by a current or most recent partner have a higher likelihood of being HIV-positive than those who have not. The paper carries out a country level multivariate analysis of the association between IPV and HIV-status, while controlling for a wide range of women's risky sexual behaviours.

Literature review

Research has shown that both women and men perpetrate violence against their partners (Flynn & Graham, 2010:2) but that the effects of this violence predict far worse outcomes for women than for men[1] (Archer, 2000; Arias & Corso, 2005). In a literature review of large population based surveys, covering more than 50 countries across the globe, the prevalence of IPV among women, measured as reporting sexual abuse, physical abuse, or both, at some point during their lifetime, ranged from 10%-52% (Garcia-Moreno et al., 2005). In a 2002 survey in Southern Africa, covering Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe, 18% of women between the ages of 16 and 60 reported having experienced IPV, (measured by asking the respondents if they had been beaten, kicked or slapped by their partner in the past year (Anderson et al., 2007).

Several studies in sub-Saharan Africa discuss the link between IPV and HIV (E.g. Anderson et al., 2007; Dunkle et al., 2004 (South Africa) Grieg & Koopman, 2003 (Botswana); Mills et al., 2002 (Ghana); Mtika, 2001 (Malawi); Jewkes, Levin and Penn-Kekana, 2003 (South Africa); Maman et al., 2002 (Tanzania); Wallman, 2000 and Ukwkuani et al., 2002 (Uganda)[2]. In a cross-sectional survey covering eight Southern African countries[3] where 18% of the women reported experiencing IPV (defined as being beaten, kicked or slapped by the current partner in the past year), the women who reported experiencing IPV consistently reported multiple partners (Anderson et al., 2007). In

[1] Measured in terms of how severe the injuries are, time required off work and the use of medical, health and other system services (Fylnn & Graham, 2010: 2)

[2] IPV has also been linked to worse health outcomes, not limited to HIV, among women, both worldwide (Garcia-Moreno & Watts, 2000; Gielen, 2000; Zierler & Krieger, 1997) and in sub-Saharan Africa (Jewkes, Levin & Penn-Kekana, 2003; Maman et al., 2002).

[3] Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe

Tanzania, Maman et al. (2000) find that HIV-positive women reported more physical and sexual violence with their current partner than did HIV-negative women (Maman et al., 2000).

However, the transmission pathways between experiencing IPV and the HIV outcome are probably complex (possibly entailing a number of biological, socio-cultural and economic factors), and far from being completely understood (WHO, 2005:3). In a comprehensive review of the literature on IPV, Maman et al., (2000) review 29 studies from the United States of America and sub-Saharan Africa[4] to explore the mechanisms through which IPV increases vulnerability to HIV infection. The authors conclude that violence exacerbates women's risk to infection in three ways: women may contract HIV through violent sex itself (where the risk of genital tearing is higher than in consensual sex); being involved with a violent man may inhibit the woman's ability to negotiate safe sexual practices[5]; and girls who experience IPV at a young age tend to adopt risky sexual practices later in life (either for reasons of psychological scaring or because they end up living in social circles where violence and unsafe sex are both rife). This review is widely cited in the literature, and various authors contend that these three pathways indeed form the connection between HIV and IPV (see for example Jewkes et al., 2006, 2003; Dunkle et al., 2006, 2004; Koenig et al., 2004; Watts & Mayhew, 2004; Campbell, 2002; Gielen et al.,2002).

The above literature has important implications to research that tries to quantify the impact of IPV on HIV status. Forced sex is the only direct transmission link between partner violence and HIV status – where abrasions or tearing may facilitate the faster transmission of HIV during sexual contact. The other measures of IPV can only increase the HIV risk through indirect pathways, e.g. when IPV leads to higher risk sexual practices by the victims later on in life. If IPV can lead to higher risk sexual practices later in life, then there could be a correlation between past abuse (or a history of abuse) and current HIV-status, where the woman was in an abusive sexual relationship but is no longer in such, but due to the exposure to IPV, now exhibits higher risk sexual practices.

[4] 2 of the studies (Wood et al., 1998 and Karim et al., 1995) were conducted in South Africa, though they involved small sample sizes.

[5] For example, women with a violent partner may fear that asking to use a condom will result in violence (Rao Gupta, 1998; Wood, 2000)

Potential confounders to the impact of IPV on HIV-status

While IPV has been said to have impact on HIV, some sexual behaviours or practices confound this relationship. These behaviours and practices increase vulnerability to HIV infection, either through increasing the likelihood of contact with infected people (when the risk behaviour entails multiple partners), or through increasing the transmission probability once the individual is exposed to infection e.g. by not using a condom. Without controlling for the sexual behaviour of the respondents, there is no way to ascertain whether the HIV risk levels we observe are largely due to the effect of IPV, or are due to other individual risk factors.

An early age of sexual debut and high numbers of sexual partners are widely cited as contributing to higher levels of infection among both men and women (Dinkelman et al., 2007; Jewkes et al., 2007; Gregson et al., 2001). Some authors argue that young girls are not fully aware of the risks of contracting HIV and they do not fully know how to protect themselves (UNAIDS, 2008: 26; UNIFEM[6]; UNFPA, 2003). Other studies argue that the vaginal tract in young women is not well developed and thus they have a higher transmission probability than older women do (Chersich & Rees, 2008; Quinn & Overbaugh, 2005). A higher number of lifetime sexual partners increases the likelihood of contact with infected people, and in sub-Saharan Africa where condom use is generally low (Gillespie, Kadiyala and Greener, 2007:1), this exacerbates the risk to HIV-infection.

Education is a consistent predictor of an even wider range of individual risk behaviours and knowledge (de Walque, 2009: 2). In a study across five African countries schooling was found to consistently predict protective behaviours[7] such as condom use, use of counselling and testing, discussion between spouses and general knowledge about HIV (de Walque: 2009:2). The same study however found education to be associated with higher levels on infidelity and a lower level of abstinence (de Walque, 2009). In Manicaland, Zimbabwe, women that were more educated reported higher levels of condom use and had lower levels of HIV infection (Gregson et al. 2004). In another study across 32

[6] http://www.unifem.org/gender_issues/hiv_aids/; accessed on 21/04/2010

[7] Education has also been associated with higher HIV risk (Gillespie Kadiyala & Greener, 2007; Gregson et al., 2006; Hargreaves & Glynn, 2002), but for the purpose of this study, it suffices to include it in the model on the basis that there is evidence that it protects against a wider range of women's sexual behaviours which do not necessarily include number of partners and age at first intercourse.

countries, Vandemoortele and Delamonica established that literate women were three times more likely, than illiterate women, to know that a healthy looking person can have HIV, and four times more likely to know the main ways to avoid AIDS (Vandemoortele & Delamonica, 2000). The authors did not directly link these findings to lower HIV prevalence rates among women, but inferred that this would lead to lower HIV risk among them. In another study in Zimbabwe, women with secondary education were less likely to report unprotected casual sex (Gregson et al., 2001). In South Africa, Johnson et al., 2009 conclude that in recent years, HIV risk among young South African women who completed secondary education is lower than that of young women with primary education only (Johnson et al., 2009).

It has also been shown that wealth predicts health outcomes independently from education (Deaton, 2003). A number of quantitative studies investigate and find an inverse relationship between wealth and HIV infection, with poorer individuals more likely to be HIV positive or to engage in riskier sexual practices. In a study on young adults in Cape Town, Dinkelman et al., (2007) find that household income was negatively associated with early sexual debut for both boys and girls. The same study also showed that among young girls, economic shocks (due to the death of the main breadwinner or loss of job) are associated with multiple sexual partnerships. Weiser et al., (2007) find that food insufficiency in the past twelve months is associated with inconsistent condom use among both men and women in Botswana and Swaziland. In rural KwaZulu-Natal, Jewkes and colleagues found that poorer women are more likely to engage in transactional sex, and were less likely to use condoms in their last sexual encounter (Jewkes et al., 2007).

A priori, we expect a positive and strong relationship between IPV and HIV risk, i.e. those women subject to IPV should be more likely to be HIV-positive than women who do not experience any IPV. Between the three types of sexual violence, sexual violence should be strongest predictor of HIV infection, as it is the only violence measure that has a direct transmission pathway between the form of abuse and the eventual HIV-status.

Methodology

Sample

We use Zimbabwe DHS 2005/06 data. Testing for HIV was done using standard blood collection, testing, and quality control procedures (Macro International

2007a, 2007b). HIV testing was done using two HIV enzyme immunosorbent assays testing for different antigens. Specimens with an initial indeterminate result were resolved using a subsequent Western Blot test. For quality control, all HIV-positive specimens and a sample of HIV-negative specimens were subject to a re-test at a different laboratory using the same testing procedure (Macro International 2007).The surveys have HIV test results anonymously linked to the background socio-economic factors and other micro data from the respondents. More information on the type of questionnaire, sample design, and other technical information is available in the country report (CSO, Zimbabwe and Macro International 2007).

We use the "Individual" dataset, which comprises only women (age 15-49), merged with the HIV dataset. A total of 8 907 women were interviewed, and of these, 7 494 were tested for HIV, giving a response rate of 85%. The HIV prevalence in this sample is 21.1%. In this study, we restrict the subsample to those women who reported having sexual intercourse and have had a sexual relationship in the twelve months preceding the interview.

Measures

The physical violence questions were prefaced as follows: "I am going to ask you about some situations which happen to some women. Please tell me if these apply to your relationship with your (last) partner?" Respondents were asked about their exposure to physical violence using three questions: "(Does/did) your (last) husband/partner ever: a) Slap you? b) Punch, kick, drag or beat you up? c) Attack you with a knife, gun or any other weapon?" Respondents had three possible responses: 1) Often, 2) Sometimes and 3) Not at all. We create a dichotomous variable which measures if any of the above three events happened, versus none of the three events occurring. Table one below gives more detail on how the variable is constructed.

Sexual violence was measured using one question: "(Does/did) your (last) husband/partner ever physically force you to have sexual intercourse with him." We generate a dummy variable which separates those who have been physically forced to have sex from those who have not.

Psychological violence is measured by the single question: "(Does/did) your (last) husband/partner ever threaten to harm you, or someone close to you?" We create a dummy variable, equal to zero if the respondent never experienced this event and one if the husband or partner ever threatened to harm the respondent or anyone close to them.

The last variable we use to measure IPV is a composite IPV measure that combines physical, sexual and psychological violence. This is a dummy variable, distinguishing between those women who have experienced any physical, sexual or emotional violence from those who have not experienced any of the three measures of IPV. Table 1 below elaborates how the different IPV measures are constructed.

Table 1: Specification of gender abuse variables

Variable	**DHS question**	**Responses**	**Coding**
Sexual violence	(Does/did) your (last) husband/partner ever physically force you to have sexual intercourse with him?	1. No 2. Sometimes 3. Often	Response 1 coded "No sexual violence" 2 and 3 coded "Sexual violence"
Physical violence	(Does/did) your (last) husband/partner ever: 1. Attack you with a knife, gun or any other weapon? 2. Slap You? 3. Punched you with a fist or something harmful	1. No 2. Sometimes 3. Often	The response "No" for ALL 3 questions coded "No physical violence", else coded "Physical violence"
Psychological violence	Does/did your last husband/partner ever: Threaten to harm you or someone else close to you	1. No 2. Sometimes 3. Often	Responses 1 coded "No emotional abuse" 2 & 3 coded " emotional violence"
IPV	Combination of all three measures above. Affirmative responses for sexual violence, emotional violence and physical violence (yes to *all* three measures) coded "IPV", else coded "No IPV".		

We measure education by using the highest education level attained. This is a categorical variable, with four categories: no education, primary education only, secondary education only and higher education. We use the DHS provided wealth index as the wealth variable. This wealth index is constructed using principal component analysis (PCA) and is developed using a composite measure of ownership of household items to construct a cumulative living standard measure that places individual households on a continuous scale of relative wealth. The index is then divided into five population quintiles, with the lowest quintile (poorest) representing the poorest twenty percent households and the highest quintile (richest) representing the wealthiest twenty percent households (Filmer and Pritchett, 2001). This grouping into quintiles is necessary as the relationship between wealth and sexual behaviour is not necessarily a linear one, as studies have suggested that HIV does not disproportionately affect the very poor alone, but also the wealthiest (Mishra et al., 2007). We do not form any prior hypothesis as to what the relationship

indeed is, and thus we use the quintiles as they can capture either a linear or a non linear relationship.

Statistical Analysis

We fit multivariate logistic regressions to the Zimbabwe 2005/6 DHS data on female respondents only, with HIV-status the dependent variable and selected variables for IPV, together with control variables for wealth, education, age at first intercourse and number of sex partners as independent variables. We cannot extend our analysis to other Southern African countries in a pooled analysis using the DHS surveys, as the other surveys either do not have a domestic violence module, or the HIV test results cannot be linked anonymously to the micro data.

We perform the analysis in three stages. In the first, we create a base model, which regresses education, household wealth, number of sex partners and the age at first sex on HIV-status. In the second model, we add the composite IPV variable to the base model. In the final model we perform, we remove the composite IPV variable but add to the base model each of the different types of IPV measures, sexual, physical and emotional violence, independently. Multivariate logistic regressions of the form: $Y_i = \beta X_i + u_i$ are run, where:
Y_i = HIV-status (0 if negative and 1 if positive) for individual i
β_1= coefficient of risk factor[8]
$X_i =$ Respective risk factor
u is the error term

All analysis is done in STATA 10.1, applying the relevant statistical weights to the survey data to enable population level inferences and standard errors adjusted for sample clustering. We test for goodness of fit is using a variant of the Hosmer-Lemeshow goodness-of-fit developed for use with logistic regression models when working with sample survey data[9] (Archer, Hosmer & Lemeshow, 2007). We carry out additional post estimation checks for multicolinearity and influential observations, and report all results in odds ratios together with the linearized standard errors.

[8] In all regression commands, the "*xi*" prefix is used if the explanatory variable is categorical. This prefix automatically generates dummy variables for categorical variables, assigning the lowest value as the reference category.
[9] The "*svylogitgof*" command is used. This command tests the independence of the independent variables from the dependant variable.

Descriptive statistics

We analyse the bivariate correlations[10] between each of our independent variables and HIV-status and the results are shown in table 2, below.

Table 2: Bivariate correlations with HIV-status

Variable	Coefficient	p-value	n
Education Level	-0.022	*0.039*	8618
Wealth Level	-0.003	0.779	8618
Age first sex	0.008	0.434	8609
Lifetime number sex partners	0.012	0.314	6802
IPV	0.014	0.333	4852
Sexual Violence	0.004	0.787	4798
Physical Violence	0.024	*0.097*	4851
Emotional violence	-0.006	0.779	4796

The bivariate correlations suggest that the education level, wealth level and emotional violence are negatively related with the likelihood of being HIV-positive. The result above, suggest that emotional violence operates in the opposite direction as both physical and sexual violence, but its coefficient is insignificant.

The average age of women in the subsample that is included in the analysis is 27.7 years, and the average number of lifetime sexual partners is 1.9 partners. Table 3 below, provides the summary statistics for continuous variables.

Table 3: Descriptive statistics for continuous data

Variable	Mean	Std. Dev.	Observations
Age	27.7	9.433	8618
No of sexual partners	1.9	5.262	6802
Age at first sex	18.2	19.711	8609

Four percent of the women have no education, as compared to 33% with primary education only, 59% with secondary education and 3% with higher education. Nine percent of the women report having been forced to perform sexual intercourse by their current or last partner. The data show that physical violence in households is the most prevalent form of IPV, with prevalence up to three times that of psychological and sexual violence. Twenty-eight percent of the women report having experienced physical violence from their most recent or current partner. Table four below summarises the IPV measures we use.

[10] These correlations are performed using the tabulate command, together with the chi2 option. This performs Pearson's chi^2 test

Table 4: Distribution of violence variables.

Variable	**Yes**	**No**	**% Yes**	**% No**
Physical Violence	1379	3472	28.4	71.6
Sexual violence	445	4353	9.2	91.8
Psychological Violence	411	4345	8.6	91.4
IPV (composite)	1664	3188	34.3	65.7

IPV is not associated with HIV infection among women in Zimbabwe, after controlling for age, the number of sex partners, household wealth, education level and the age at first sex. In the second model, where we add the composite IPV variable to the base model, the results suggest that IPV increases in the odds for HIV infection (OR 1.07), but this result is statistically insignificant (p-value 0.379). In the third model, the different measures of IPV, sexual violence, physical violence and psychological violence are all statistically insignificant, again controlling for the effect of age, education, household wealth, the number of sex partners and age at first sex. Both coefficients for sexual violence and physical violence predict higher odds of HIV infection (OR's 1.02, 1.15, respectively), but they are statistically not valid. The emotional violence variable suggests the opposite relationship, with exposure to emotional violence hinting towards a lower probability for HIV infection (OR 0.88), but this too is insignificant.

In all models, completing secondary education has a very strong protective effect against HIV, with up to a 32% lower probability for HIV infection for respondents who completed secondary education (OR 0.68) as compared to those without education, and this is after controlling for the wealth level, number of sex partners, age at first intercourse and household wealth. The wealth level is a poor predictor of HIV-status, with no statistical differences in HIV risk among all the wealth quintiles. The number of lifetime sex partners is only significant while controlling for the wealth level, education level, number of partners and age at first sex and the composite IPV variable (OR 1.01), but once the IPV variable is broken down to the three constituent violence sub types (psychological, physical and sexual), this significance falls away.

Results

Table 3: Multivariate regression

	Base model		Composite IPV		Different types of IPV	
Hiv_status	**O R**	**P-value (SE)**	**O R**	**P-value (SE)**	**Odds Ratio**	**P-value (SE)**
Age	1.00	0.983(0.004)	1.00	0.810 (0.005)	1.00	0.645 (0.05)
Primary Education	0.88	0.389 (0.129)	0.76	0.112 (0.130)	0.74	*0.080** (0.128)*
Secondary Education	0.74	*0.048** (0.11)*	0.68	*0.037** (0.12)*	0.66	0.026** (0.12)
Higher Education	0.93	0.754 (0.21)	0.88	0.646 (0.24)	0.82	0.496 (0.23)
Poorer	0.86	0.156 (0.09)	0.86	0.188 (0.10)	0.85	0.161 (0.10)
Middle	0.88	0.212 (0.09)	0.82	0.112 (0.10)	0.82	0.116 (0.10)
Richer	1.00	0.977 (0.104)	0.89	0.313 (0.11)	0.87	0.266 (0.11)
Richest	1.1	0.527 (0.12)	1.00	0.989 (0.14)	1.00	0.986 (0.14)
Number sex partners	1.01	0.269 (0.005)	1.01	*0.086** (0.01)*	1.01	0.163 (0.01)
Age first sex	1.00	0.710 (0.002)	1.00	0.400 (0.00)	1.00	0.337 (0.00)
IPV			1.07	0.386 (0.09)		
Physical violence					1.15	0.121 (0.11)
Sexual violence					1.02	0.872 (0.14)
Emotional violence					0.87	0.370 (0.13)
N	6793		4833		4735	
P	0.0930		0.1133		0.129	
Pseudo R^2	0.0026		0.0037		0.0041	

** 10%, ** 5%, *** 1% level of significance. The reference category for education level is No education, and for wealth level is "Poorest". The reference category for each of the violence measures is No such violence. All standard errors are shown in parenthesis and are robust - corrected for sample clustering and outliers*

Discussion

Our findings on the link between IPV and HIV-status worryingly mimic the current state of quantitative literature on IPV and HIV in sub-Saharan Africa, and even more so in Southern Africa. While there is a lot of qualitative research suggesting that IPV has wide-ranging negative consequences for women in terms of HIV risk (cited above), most attempts to quantify these associations have come up with limited empirical supporting evidence. The different measures that have been in use to try ensnaring the impact of IPV on HIV have rarely been satisfactory, often predicting either a far smaller impact of IPV on HIV-status, or no association at all, between the two. While very few studies in the sub region have shown strong associations, these findings have not been corroborated by similar studies, particularly among the general population in other Southern African countries. Without any universal definitions on what IPV entails, and even more importantly, universal methods on how to measure it, it will always be contestable to categorically state that IPV does not leave women more vulnerable to HIV, but this study uses a nationally representative sample of women (which is less likely to have bias than smaller studies), and we find no association between IPV and HIV among Zimbabwean women.

While we found no association between IPV and HIV, a similar, widely cited study in South Africa found elevated HIV risk among women experiencing IPV after controlling for women's risk behaviour, (Dunkle et al., 2004) and concluded that this was probably a result of male IPV perpetrators typically having a higher HIV risk profile than those men who do not abuse their partners. The difference in results may be due to a couple of reasons, the first being that IPV could operate through an entirely different set of dynamics in South Africa, or specifically, Soweto, than it does in Zimbabwe. This however, could not be investigated in this study, but it would be interesting if research relooked the behavioural patterns of those men who abuse their partners. It could be that among Zimbabwean men, those that abuse their partners do not have any significantly different sexual behaviour that would increase the likelihood that they infect their partners than those who do not. A second reason for the differing conclusions could be that we are unable to incorporate historical exposure to IPV in our analysis, and we do not have a clear hypothesis as to how this may affect the associations in our model.

Our research corroborates other research that contends that schooling is a very strong predictor of HIV status, even after controlling for women's own risk behaviours, with secondary schooling in particular strongly protecting against HIV (e.g. de Walque 2009, Hargreaves et al., 2002, Gregson et al., 2004). It is also apparent from the data, that there is high prevalence of IPV among women,

as is the case with other Southern African countries (WHO, 2005: 12). An earlier study (cited above) indicates that in Southern Africa as a whole, the prevalence of IPV could be as high as 18% among women, and 2005 WHO estimates peg it as high as 52% in some countries in the region (WHO, 2005: 10). Zimbabwe DHS data similarly show a high prevalence of IPV, with at least 28% of the sample reporting IPV in the 12 months preceding the interview. IPV thus still remains an important health problem in Zimbabwe that needs to be addressed.

Threats to validity

Data limitations constrain the measurement of past abuse as there is no variable that measures whether the respondent had been abused or not earlier in life. The data however has information on whether the first sexual intercourse was forced or not. We reason that this variable is not a good proxy for measuring past abuse as it is very narrow in scope. IPV includes a wide range of abuse forms and measuring past abuse using this single variable limits the scope of our analysis. We however appreciate the importance or factoring in past abuse as it can indeed predict HIV-status, or predict a higher risk sexual behaviour.

Measures of wealth based on household assets or household income may not reflect the true economic position of the women living in the households due to gender inequality (Rodrigo & Rajapakse, 2010:12). The women may still be economically vulnerable and this vulnerability is linked to increased probabilities of HIV infection among women in Southern Africa (Kim et al., 2008; Byron and Gillespie, 2008). Using a household wealth based index therefore, may not adequately capture the sexual practices that a certain level of wealth (or lack of) may induce, as the household wealth in the presence of inequality, does not reflect the true economic position of the women. In our review, we contend that the wealth level may determine some aspects of sexual behaviour and HIV risk, thus if this measure of wealth is biased, the results too could be biased.

Lastly, the data are based on self reported behaviour on gender violence, and a wide range of literature discusses the problem of bias associated with self reported behaviour and especially self reported data on sexual behaviour (McAuliffe et al., 2007; Jaccard & Wan, 2006; Hanck et al., 2008).

Conclusion

Using a nationally representative sample of women, there is no evidence of an association between IPV and HIV-status, after controlling for age, household wealth, education level and age at first sex and the number of sex partners. This is a very powerful result, and we call for restraint before making blanket claims about how IPV exacerbates HIV risk among women in Southern Africa.

There is need for more empirical research investigating the association between IPV and HIV, especially among the general population and not just core groups such as prostitutes and migrant labourers. As much as possible, research should be directed towards studies that can be generalised to wider population groups and not just those limited to these core groups as the pathways of transmission between the two could actually be different. Further, studies on the risk behaviours of men who perpetrate IPV could also help expose some of the underlying dynamics between IPV and HIV.

Nationally representative data on IPV in Southern Africa is very limited, and yet such data is needed desperately if researchers are to pin down some of the dynamics of HIV among women in Southern Africa.

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