



# How do area-level socioeconomic status and gender norms affect partner violence against women? Evidence from Tanzania

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## Abstract

**Objectives** To explore how area-level socioeconomic status and gender-related norms influence partner violence against women in Tanzania.

**Methods** We analysed data from the 2010 Tanzania Demographic and Health Survey and used multilevel logistic regression to estimate individual and community-level effects on women's risk of current partner violence.

**Results** Prevalence of current partner violence was 36.1 %; however, variation in prevalence exists across communities. Twenty-nine percent of the variation in the logodds of partner violence is due to community-level influences. When adjusting for individual-level characteristics, this variation falls to 10 % and falls further to 8 % when adjusting for additional community-level factors. Higher levels of women's acceptance towards wife beating, male unemployment, and years of schooling among men were associated with higher risk of partner violence; however, higher levels of women in paid work were associated with lower risk.

**Conclusions** Area-level poverty and inequitable gender norms were associated with higher risk of partner violence. Empowerment strategies along with addressing social attitudes are likely to achieve reductions in rates of partner

violence against women in Tanzania and in other similar low-income country settings.

**Keywords** Partner violence against women · Tanzania · Multilevel model · Poverty · Gender norms

## Introduction

Partner violence against women in Tanzania is a serious concern with adverse physical, mental and sexual and reproductive health outcomes (Ellsberg et al. 2008; Sa and Larsen 2008; Mahenge et al. 2013). Moreover, the consequence on productivity may be significant with the lost earnings to women because of partner violence estimated to amount to 1.2 % of Tanzania's GDP (Vyas 2013). The 2010 Tanzania Demographic and Health Survey (TDHS) estimated that nationally, 43.6 % of ever married or cohabiting women, ages 15–49, had ever experienced physical or sexual violence from their current or most recent partner. Prevalence, however, varied considerably across the country ranging from less than 10 % in Pemba and Unga regions to over 70 % in Dodoma and Mara regions [National Bureau of Statistics (NBS) (Tanzania) and ICF Macro 2011]. The extent of the geographic variation raises the question on whether a woman's risk of partner violence is explained by variation in individual level characteristics across the different settings, or whether area of residence explains part of the variation in risk.

Assuming members of a community share a common goal—to live in a crime-free environment—social disorganisation theory asserts that concentrated disadvantage (area-level poverty, unemployment), residential instability and ethnic heterogeneity weaken community attachments and trust by impairing communication among residents,

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thus impeding a community's ability to sanction criminal behaviour (Shaw and McKay 1942). Studies in the USA that extended the theory to area-level variation in partner violence found rates were higher in the poorest and most impoverished neighbourhoods (O'Campo et al. 1995; Cunradi et al. 2000; DeMaris et al. 2003; Bonomi et al. 2014). Studies have also explored whether a community's ability to mobilise effectively and regulate their members is mediated through "collective efficacy"—the extent to which neighbours trust one another (social cohesion) and can be counted on to intervene (informal social control) (Sampson and Groves 1989; Sampson et al. 1997). Findings, however, are mixed with studies from Chicago documenting collective efficacy to be associated with lower rates of intimate homicide and nonlethal partner violence against women but not with youth dating violence against females (Browning 2002; Jain et al. 2010). A nationally representative study found partner violence against women to be significantly and negatively associated with social cohesion but not significantly associated with social control (Caetano et al. 2009).

Of the few studies from low- and middle-income countries (LMIC) to examine community-level factors associated with partner violence perpetration or victimisation, three factors emerged as predictive: norms more tolerant towards partner violence; levels of violence more generally, and indicators of gender inequality (VanderEnde et al. 2012).

In India, aggregate male attitudes towards acceptance of wife beating and district murder rates were significantly associated with men's perpetration of physical violence towards their female partner (Koenig et al. 2006). In Colombia women's risk of partner violence was related to the overall level of partner violence against women in their community, and in Haiti, men's physical abuse towards children at the community-level was significantly associated with physical and emotional partner violence, while high community female headship, male joblessness and neighbourhood poverty were significantly associated with sexual partner violence (McQuestion 2002; Gage 2005; Gage and Hutchinson 2006). No significant associations, however, were found between conventional attitudes towards gender roles and concern about local levels of crime with women's risk of experiencing partner violence in Bangladesh or between community-level deprivation and individual partner violence risk in Brazil (Naved and Persson 2005; Kiss et al. 2012). In India, neighbourhood wealth, state per capita income and state human development (an index comprising life expectancy at age 1; infant mortality rate; literacy rate for people aged 7+; formal education; per capital consumption; and worker population ratio) were not associated with partner violence; however, state-level gender equality was associated with lower violence (Ackerson and

Subramanian 2008). Finally, in Bangladesh, women were at lower risk of partner violence in areas where more women worked compared to women in communities where fewer women worked (Koenig et al. 2003).

Community-level effects have also been found to mute or augment risk or protective factors operating at the individual level. In India the protective effect of higher women's educational attainment on partner violence risk was greatest among women in communities with higher levels of male and female literacy, but the protective effect of secondary education was muted in areas with high acceptance of wife beating (Ackerson et al. 2008; Boyle et al. 2009). In Haiti, higher community-level of male unemployment exacerbated the effect of drinking on all forms of partner violence after controlling for other factors (Gage 2005).

Using an ecological framework that provides a link between individual and community-level characteristics, we explore factors associated with partner violence in Tanzania focussing on area-level socioeconomic status (SES) and gender-related social norms (Heise 2011). Specifically, we seek to estimate the extent of community-level variation in prevalence of partner violence; assess whether variation in partner violence across communities persists after controlling for individual and neighbourhood effects; and estimate the association between community-level factors and women's individual risk of current partner violence.

## Methods

We used the nationally representative 2010 TDHS data collected between December 2009 and May 2010 [National Bureau of Statistics (NBS) (Tanzania) and ICF Macro 2011]. Sampling took place in all 26 regions of mainland Tanzania and Zanzibar and was stratified by urban and rural location. A two-stage sampling procedure was employed; in the first stage, 475 clusters (primary sampling units) were selected from a list of enumeration areas based on the 2002 population and household census. In the second stage, a household listing was completed in each cluster from which 22 households were selected for interview (except in Dar es Salaam where 16 households in each cluster were selected). In total 10,300 households were selected for interview.

The TDHS administered three questionnaires: a household questionnaire (to 9623 households); a women's questionnaire (to all women ages 15–49 considered permanent residents in the household yielding a sample of 10,139); and a men's questionnaire (to 2527 males from a sub-sample of households). The women's questionnaire included a domestic violence module and was administered to a sub-sample of 5688 women where one eligible (ever-

partnered) woman per household was randomly selected for interview.

#### Measure of partner violence

Women were asked the following eight questions: Does/did your (last) husband/partner ever: Push you, shake you, or throw something at you?; Slap you?; Twist your arm or pull your hair?; Punch you with his fist or with something that could hurt you?; Kick you or drag you or beat you up?; Try to choke you or burn you on purpose?; Physically force you to have sexual intercourse with him even when you did not want to?; and force you to perform any sexual acts you did not want to?

Women reporting experience of any of these acts were asked whether it occurred “often”, “sometimes” or “not at all” in the past 12 months. Current physical or sexual partner violence was identified if a woman indicated experience of one or more act of physical or sexual violence in the past 12 months.

#### Individual-level characteristics

All individual level factors relating to the woman, her partner and her relationship were generated from the women’s survey data. Women’s socio-demographic characteristics included: age (centred on the mean women’s age); marital status—recorded *married* or *cohabiting*; educational attainment based on the highest level of education achieved and years in education—coded *no schooling*, *some primary*, *complete primary*, *some secondary*, and *complete secondary* or *higher*; whether the woman had stable paid work (worked all year and paid in cash)—coded *yes no*—developed from questions on whether they worked in the past year, and if so, method of payment (cash, in-kind, not paid) and frequency of work (all year, seasonal/occasional); and ownership of capital assets (land or property)—coded *doesn’t own*, *joint ownership only*, and *independent ownership*.

Other characteristics related to the woman included: attitude towards the acceptability of physical violence—based on the respondent’s acceptance of wife beating under at least one out of five circumstances, she goes out without telling him, neglects the children, argues with him, refuses to have sex with him, and burns the food—coded *yes no*; whether her first sexual encounter was forced—recorded *yes no*; and whether her mother was beaten by her father—recorded *yes, no* and *don’t know*.

Partner socio-demographic characteristics included: age (centred on the mean partners’ age); educational attainment using the same education groups coded for women; and occupation grouped into four categories: *professional*, *skilled*, *agriculture*, and *unskilled/unemployed*.

Relationship characteristics included: number of children (biological to the woman) in the home; partner relationships with other women including polygamous—coded *no*, *yes* and *don’t know*; partner alcohol use—coded *never drunk*, *sometimes/often drunk*; and household SES. Household SES was measured using information from the household survey on asset ownership and household infrastructure characteristics to establish a socioeconomic score. Households were ranked on this score and divided into quintiles labelled “poorest” to “least poor”.

#### Community-level factors

Using clusters as a surrogate for the “community”, seven community characteristics were explored: area-level poverty; men and women’s attitudes towards wife beating; level of male unemployment; level of women in paid work; and mean educational level of men and women. Community-level poverty and men and women’s educational level were measured using household survey data. Men’s attitudes to wife beating and unemployment were measured using men’s survey data. Women’s attitudes to wife beating and employment were measured using women’s survey data. Poverty was defined as the percentage of households within a community in the poorest socioeconomic quintile. Men and women’s attitudes towards wife beating were measured as the mean number of reasons reported that justify a man beating his wife. Male unemployment was measured as the percentage of men who did not work (includes seasonal work) and women’s employment was measured as the percentage of women in paid work (includes occasional/seasonal). Men and women’s education was measured as the mean years of schooling among those aged 15 and over.

#### Data analysis

Analysis is based on currently partnered women—married or cohabiting—who experienced current physical or sexual partner violence or who had never experienced partner violence, i.e. women who experienced partner violence in their lifetime but not in the past year were excluded. This was to identify a group of women who had never experienced physical or sexual partner violence to use as the reference group for establishing associations.

We used multilevel logistic regression to account for the hierarchical nature of the data and specified two levels—individual and community (with clusters reflecting communities). Responses nested within communities are independent across groups but not independent within groups, thus violating the assumption of independent observations. Multilevel model allows for correlated response by partitioning the residual errors associated with

each level in the hierarchy (Rabe-Hesketh and Skrondal 2008). The method models the logodds of individual woman  $i$  experiencing current physical or sexual partner violence in community  $j$  and is expressed as

$$\text{Log}(p_i/(1 - p_i)) = \beta_0 + \sum \beta_j x_{ij} + \zeta_j + e_{ij},$$

where  $\beta_0$  is the mean logodds of partner violence across the sample;  $\beta_j x_{ij}$  are the fixed effects coefficients and  $\zeta_j$  is the random intercept or random effects variances (differential from the overall mean) attributable to the community. Random effects variances are used to estimate the Intra cluster correlation (ICC) that quantifies the proportion of the variance in the outcome due to clustering at a particular level. The between-cluster variability ( $\Psi$ ) is distributed normally  $N(0, \delta^2)$

$$\text{ICC} = (\rho) = \frac{\Psi}{(\Psi + \Pi^2/3)}.$$

Analyses were conducted using STATA v13.0. Prevalence of current partner violence and individual-level descriptive data were weighted and adjusted for clustering. Spearman correlation coefficient was used to measure statistical dependence between community-level measures. Community-level variation in prevalence of partner violence was assessed from a null multilevel model that included only a random intercept term. Individual and community-level factors were then added to the model to assess whether variation in partner violence across communities persisted. Because clusters with few observations can lead to unstable estimates, clusters with fewer than five observations ( $n = 20$ ) were excluded from the regression analyses (Clarke 2008).

## Results

Prevalence of current physical or sexual partner violence against women was 36.1 % (95 % CI 34.0–38.2). Women's mean age was 31 and the vast majority, 92 %, were married (Table 1). Almost 23 % had no schooling and few, 4.6 %, had completed secondary education. Slightly over one in five women had stable paid work and just over one-half owned land or property either independently (10 %) or jointly (43 %). Acceptance of wife beating was high, 54.9, and 9.7 % reported their first sexual encounter was forced. Over one-third of women reported their mother had been hit by their father.

The mean number of children in households was 2.5. One in five women reported their partner had relationships with other women and one-third reported their partner was sometimes or often drunk. Partner mean age was 38; only

**Table 1** Sample characteristics of currently partnered women, Tanzania, 2010

	Total sample <sup>a</sup> $n = 4776$
Urban	
Yes	24.8
Age	
Mean (standard deviation)	31.13 (0.20)
Relationship status	
Married	92.1
Cohabiting	7.9
Educational attainment	
No schooling	22.8
Some primary	13.5
Complete primary	55.0
Some secondary	4.0
Complete secondary or higher	4.6
Stable paid employment	
Yes	20.7
Ownership of land and/or house	
Doesn't own	47.2
Independent ownership	10.1
Joint ownership	42.7
Acceptance of wife beating	
At least one reason to hit	54.9
Forced first sex	
Yes	9.7
Mother hit by father	
No	54.6
Yes	37.8
Don't know	7.6
Number of children at home	
Mean (standard deviation)	2.54 (0.05)
Household SES	
Poorest	18.3
Middle poor	20.7
Middle	20.5
Middle rich	20.9
Richest	19.7
Partner age	
Mean (standard deviation)	38.37 (0.24)
Partner educational attainment	
No schooling	15.1
Some primary	14.5
Complete primary	56.0
Some secondary	5.0
Complete secondary or higher	9.4
Partner occupation	
Professional	12.4
Skilled	13.5

**Table 1** continued

	Total sample <sup>a</sup> <i>n</i> = 4776
Agriculture	64.0
Unskilled/unemployed	10.1
Polygamous/other women	
No	78.3
Yes	20.4
Don't know	1.3
Alcohol use	
Never drunk	67.0
Sometimes/often drunk	33.0

Adjusted for survey weights, clustering and strata

15.4 % had at least some secondary schooling and almost two-thirds were in productive agricultural work.

Table 2 shows the distribution of community-level characteristics. There was vast variation in prevalence of current physical or sexual partner violence between

communities ranging from 0 to 92 % of women. There was also variation in all community-level factors. The percentage of households in the poorest socioeconomic group varied between communities ranging from 0 to 90 % of households. The mean number of reasons women justified wife beating was 1.49 a level higher than for men (0.89); the range between communities, however, was greater for men (0–5.00) than for women (0–3.76). The mean percentage of women in paid work was 38 % ranging from 0 to 94 %. The proportion of women's partners who were unemployed was 46 % ranging between 0 and 100 %. Across communities, average years of education measured 6.05 for men and 4.97 for women.

Table 3 presents correlations among community-level factors. All paired correlations were statistically significant ( $p < 0.001$ ). Levels of poverty, acceptance of wife beating (men and women) and men's unemployment were negatively associated with urban location, the level of women in paid work and with men and women's educational level.

Results from the multilevel regression analyses are presented in Table 4. There is evidence of variability in partner violence at the community-level with 29 % of the

**Table 2** Community-level characteristics, Tanzania 2010

	%/mean	Std. dev	Min	Max
Prevalence of IPV in cluster	31.2	22.2	0.0	91.7
Percent in cluster within poorest quintile	19.4	21.0	0.0	90.0
Mean number of reasons within cluster to justify beating	0.89	0.84	0.0	5.00
Percent partner unemployed (including seasonal/occasional)	46.2	33.6	0.0	100.0
Mean number of reasons to hit (women)	1.49	0.81	0.0	3.76
Percent women in paid work	38.1	23.8	0.0	93.8
Mean years education men	6.05	1.78	0.91	13.61
Mean years education women	4.97	1.81	0.59	11.05

**Table 3** Correlation coefficients among community-level characteristics, Tanzania, 2010

	Urban	Poverty	Men's acceptance of wife beating	Men's unemployment	Women's acceptance of wife beating	Women in paid work	Men's education	Women's education
Urban	1							
Poverty	-0.55***	1						
Men's acceptance of wife beating	-0.18***	0.27***	1					
Men's unemployment	-0.35***	0.47***	0.18***	1				
Women's acceptance of wife beating	-0.28***	0.37***	0.43***	0.37***	1			
Women in paid work	0.40***	-0.53***	-0.31***	-0.30***	-0.40***	1		
Men's education	0.59***	-0.75***	-0.26***	-0.41***	-0.34***	0.51***	1	
Women's education	0.57***	-0.75***	-0.23***	-0.41***	-0.37***	0.51***	0.89***	1

\*\*\*  $p < 0.001$

**Table 4** Multivariate regression models based on sample of currently partnered women, Tanzania, 2010

Variable Reference group	Category	Model 1			Model 2			Model 3		
		OR	95 % CI		OR	95 % CI		OR	95 % CI	
Age		1.00	0.99	1.01	1.00	0.98	1.01	1.00	0.99	1.02
Relationship status	Married	0.97	0.73	1.30	0.83	0.61	1.11	1.18	0.88	1.58
	<i>Cohabiting</i>									
Educational attainment	Some primary	1.36**	1.06	1.73	1.31*	1.02	1.69	1.28	0.99	1.65
	Complete primary	1.21*	1.00	1.46	1.16	0.94	1.43	1.09	0.88	1.35
	Some secondary	1.04	0.73	1.47	1.20	0.82	1.74	1.23	0.83	1.81
	Complete secondary or higher	0.59*	0.36	0.96	0.76	0.45	1.29	0.71	0.42	1.19
Stable paid work (No)	Works for pay all year	0.73**	0.60	0.90	0.75**	0.60	0.93	0.84	0.68	1.05
Ownership of land or house	Independent ownership	1.52**	1.17	1.97	1.47**	1.12	1.92	1.29	0.98	1.68
	Joint ownership <sup>a</sup>	1.31**	1.10	1.54	1.29**	1.09	1.53	1.17	0.98	1.39
Acceptance of wife beating	At least one reason to hit	1.91***	1.64	2.22	1.87***	1.60	2.18	1.56***	1.32	1.83
	<i>No reason to hit</i>									
Forced first sex	Yes	2.08***	1.63	2.65	1.96***	1.53	2.51	1.91***	1.49	2.45
Mother hit by father	Yes	2.91***	2.49	3.41	2.73***	2.33	3.21	2.44***	2.08	2.87
	Don't know	1.90***	1.45	2.50	1.83***	1.38	2.42	1.71***	1.29	2.26
Number of children at home					1.03	0.99	1.08	1.02	0.98	1.07
Household SES	Middle poor				0.86	0.68	1.09	0.88	0.69	1.13
	Middle				0.99	0.78	1.26	0.99	0.77	1.28
	Middle rich				1.15	0.88	1.50	1.22	0.92	1.63
	Richest				0.80	0.55	1.17	0.90	0.61	1.35
Partner age					0.99*	0.98	1.00	0.99*	0.98	1.00
Partner educational attainment	Some primary				1.52**	1.16	1.99	1.50**	1.14	1.98
	Complete primary				1.42**	1.12	1.81	1.33**	1.04	1.70
	Some secondary				0.92	0.62	1.35	0.96	0.65	1.43
	Complete secondary or higher				0.79	0.52	1.19	0.73	0.48	1.11
Partner occupation	Skilled				0.96	0.70	1.30	0.97	0.71	1.33
	Professional				0.77	0.58	1.02	0.75	0.57	1.00
	Unskilled/unemployed				1.02	0.73	1.41	1.08	0.78	1.51
Polygamous/other women	Yes				1.54***	1.26	1.87	1.53***	1.26	1.87
	Don't know				1.27	0.60	2.68	1.24	0.59	2.61
Alcohol use	Sometimes/often drunk				4.00***	3.39	4.71	3.66***	3.10	4.32
	<i>Never drunk</i>									
Location	Urban	1.13	0.87	1.46	1.35*	1.01	1.80	1.37*	1.01	1.86
Poorest quintile								1.27	0.67	2.44
Percent male unemployment (including seasonal)								1.44*	1.04	1.97
Mean men's attitude to wife beating								1.05	0.94	1.18

**Table 4** continued

Variable Reference group	Category	Model 1			Model 2			Model 3		
		OR	95 % CI		OR	95 % CI		OR	95 % CI	
Mean women's attitude to wife beating								1.60***	1.38	1.86
Percent women in cash employment (including agriculture)								0.54*	0.32	0.89
Mean years men's educational attainment								1.16*	1.02	1.31
Mean years women's educational attainment								1.03	0.91	1.16
Fixed effect intercept		0.14	0.10	0.20	0.08	0.05	0.12	0.01	0.01	0.03
Sigma $U^2$		0.59			0.38			0.27		
Rho		0.15			0.10			0.08		

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

<sup>a</sup> Ownership of land or property or both joint only

total variation in the logodds of experiencing partner violence being driven by factors operating at the community-level (null model not shown). Model 1 includes individual characteristics relating to the woman. Compared to no schooling, some primary education was significantly associated with higher risk of violence (OR = 1.36); however, having completed secondary education or higher was significantly associated with lower risk (OR = 0.59). There was a statistically significant protective association between stable paid work and women's risk of partner violence (OR = 0.73); however, owning capital assets, in the form of land or property, independently or jointly with another, elevated women's risk of partner violence (OR = 1.52 independent ownership; OR = 1.31 joint ownership). Likewise, women who agreed with at least one statement justifying wife beating were at significantly higher risk of partner violence (OR = 1.91) as were women whose first sexual experience was forced (OR = 2.08) or whose mother had been hit by her father (OR = 2.91). With the addition of individual-level factors related to the woman, the proportion of total variation operating at the community-level falls to 15 %.

Model 2 includes additional characteristics relating to the woman's partner and household. Except for the protective association between women who complete secondary schooling and partner violence, all significant associations found in model 1 remained significant and with little change in the odds. Significant associations were found with partners' age, educational attainment, excessive

use of alcohol and relationships with other women. An increase in partner's age of 1 year reduced the odds of women experiencing partner violence by 1 %. Compared with no education, women whose partners had attained primary level education were at increased risk of partner violence (OR = 1.52 some primary; OR = 1.42 complete primary). Men's relationship with other women and alcohol use both increased women's risk of partner violence (OR = 1.54 other women; OR = 4.00 sometimes/often drunk). There is a borderline significant lower risk association found among women whose partners are in agricultural employment compared to women whose partners are professional (OR = 0.77,  $p = 0.071$ ). There were no significant associations between partner violence and the number of children in the home and household SES. With the addition of these partner factors, the portion of variation in the logodds of current partner violence that appears to operate at a community-level falls to 10 %.

Model 3, includes the seven community-level factors of which four were significantly associated with women's individual risk of current partner violence. Higher level of acceptance towards wife beating by women was associated with significantly higher risk; however, there was no association between acceptance of wife beating by men and women's experience of partner violence. Male unemployment and mean years of schooling were significantly associated with higher risk of partner violence but living in an area with higher levels of women in paid work was significantly associated with lower risk (OR = 0.54,

$p = 0.016$ ). Community-level poverty and women's aggregate educational level were not significantly associated with risk of partner violence. At the individual level, the significant risk association found with some primary school level education and capital asset ownership become borderline significant ( $p < 0.1$ ) and the significant protective association found with stable paid work becomes insignificant ( $p = 0.131$ ). While the percentage of total variation in the logodds of current partner violence attributable to the community-level is low at 8 %, the level of between-cluster variations is nonetheless significant (LRT  $p < 0.001$ ).

## Discussion

We sought to explore how social aspects of the environment, particularly socioeconomic characteristics and gender norms, relate to partner violence against women in Tanzania. While the proposition that community characteristics can influence women's risk of violence is not new, there is still little empirical support for this proposition from LMIC (VanderEnde et al. 2012). Tanzania makes for an interesting case study and could be considered representative of other countries in Africa not affected by conflict. Therefore, the implications from this study's findings could have resonance for other countries in the continent and low-income countries more generally. We found community-level variation in current partner violence exists, and this variation persists, though is much reduced, when individual and community-level factors are included in the model. The reduction in variation confirms both the distribution of individual-level factors and previously identified community-level factors explain much of the geographic distribution of partner violence risk in Tanzania.

At the individual level, women's acceptance of wife beating; women growing up in a home with domestic violence; partner relationships with other women and partner problematic alcohol use were significantly associated with women's risk of partner violence—findings consistent with other population-based studies from Tanzania (McCloskey et al. 2005; Abramsky et al. 2011). Women who owned capital assets jointly and whose first sexual encounter were forced, were at increased risk of partner violence. Women in stable paid work, however, were at reduced risk of partner violence, a finding that became insignificant with the inclusion of community-level factors. A methodological issue arising from this relationship, but not addressed in this analysis, is self-selection bias, i.e. factors influencing women's decisions to enter into paid work create fundamental differences with the comparison group of women who do not pursue paid work.

A study, exploring the same data, used propensity score matching methods to account for this bias and found rates of current partner violence were lower among women with stable paid work in urban areas and among women with any paid work (all year and occasional/seasonal) in rural areas (Vyas and Heise 2014). Finally, women whose partner had primary level education, compared to no education, were at increased risk of partner violence, while women with older partners or whose partner worked in agriculture (compared to professional) were at reduced risk.

At the community-level, four factors were significantly associated with women's risk of partner violence: level of male unemployment; mean years of education among males over 15; level of women in paid work; and women's aggregate acceptance of wife beating. Why area deprivation, indicated by male unemployment, is associated with higher risk of partner violence is not clear. The finding may conform to social disorganisation theory that more deprived communities are less likely to collectivise in realising their aim to live in a violence-free environment; or areas of high unemployment may encourage more collective and individual alcohol consumption, further exacerbating conflict and tensions within the household (Gage 2005). Alternatively, men who are unable to fulfil their culturally defined role as economic provider may reassert their power and authority in the household by using violence as a way to compensate for feelings of inadequacy (Silberschmidt 2001; Gibbs et al. 2014). Higher level of men's educational attainment was also significantly associated with increased risk of partner violence, mirroring the relationship observed at the individual level. Evidence from LMIC has documented that the protective benefits of education are generally realised only with tertiary education or at least completing secondary school, and women with partners who have either no schooling or the highest levels of schooling have the lowest risk of violence (Jewkes 2002; Vyas and Watts 2009). It is likely that the average level of men's education across the communities (6 years) is not at a level sufficient to translate into reduced risk of partner violence for women.

An important finding is that in areas with a higher proportion of women in paid work (including seasonal/occasional), women's risk of partner violence is significantly reduced, thus a benefit is conferred to women who themselves do not earn money but live in areas where many women do. The mechanism through which this occurs maybe that the more women there are in paid work, the greater the social networks of support that exist among women in that community.

Collective acceptance or tolerance of wife beating provides an environment that makes it easier for violence to persist and to maintain male authority (Heise 2011). We



found higher aggregate acceptance of wife beating among women than men—consistent with population-based studies from sub-Saharan Africa and also among 576 couples recruited into a sexual health intervention in south-western Tanzania, where acceptance of wife beating was 71 and 48 % among female and male participants respectively (Uthman et al. 2009; Speizer 2010; Krishnan et al. 2012). Living in areas with higher acceptance of wife beating by women was significantly associated with increased risk of partner violence. Community-level men's attitude towards wife beating, however, was not significantly associated with partner violence, a relationship found to be positive and significant in Nigeria (Uthman et al. 2011). The reason for these relationships may be that women's acceptance of wife beating, in addition to reflecting prevailing social norms and women's conformity to dominant understandings of gender roles and relationships, could also be an expression of their experiences of violence, while men's supportive view of wife beating could be less related to their perpetration of violence against their female partners, but more related to other factors, e.g. witnessing domestic violence in childhood as found in Uganda (Speizer 2010).

A limitation of this study arises from its cross-sectional design limiting our ability to establish causal relationships, e.g. does women's approval of wife beating lead to its increased occurrence, or does the rate of violence against women by their male partners lead to women adopting the view violence is normative. Another limitation is we were not able to explore the effects of other community-level factors, e.g. broader crime levels or indicators of social cohesion such as community trust. These factors may explain some of the unexplained heterogeneity identified in the model.

This study sought to explore the effects of community-level SES and gender norms on women's risk of partner violence in Tanzania. Both area-level poverty and inequitable gender norms were associated with higher risk of partner violence against women, while increasing proportion of women in paid work was associated with reduced risk. Economic empowerment strategies among women along with addressing social attitudes that perpetuate violence are likely to achieve reductions in the rates of partner violence against women in Tanzania and other similar low-income country settings.

#### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest. The authors received no financial support for the research, authorship, and/or publication of this article.

**Ethical approval** This study analyses secondary data gathered as part of the DHS programme. The DHS ethical review states "Procedures and questionnaires for standard DHS surveys have been reviewed and approved by the ICF International Institutional Review

Board (IRB). Additionally, country-specific DHS survey protocols are reviewed by the ICF IRB and typically by an IRB in the host country. The ICF International IRB ensures that the survey complies with the US Department of Health and Human Services regulations for the protection of human subjects (45 CFR 46), while the host country IRB ensures that the survey complies with laws and norms of the nation."

**Informed consent** Informed consent was obtained from all individual participants included in the original study. <http://dhsprogram.com/What-We-Do/Protecting-the-Privacy-of-DHS-Survey-Respondents.cfm>.

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