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*J Epidemiol Community Health*. 2019 February ; 73(2): 176–181. doi:10.1136/jech-2018-211357.**Community collective efficacy is associated with reduced physical intimate partner violence (IPV) incidence in the rural province of Mpumalanga, South Africa: Findings from HPTN 068****Anna M. Leddy<sup>1,\*</sup>, Sheri A. Lippman<sup>1,2</sup>, Torsten B. Neilands<sup>1</sup>, Rhian Twine<sup>2</sup>, Jennifer Ahern<sup>3</sup>, F. Xavier Gómez-Olivé<sup>2</sup>, Stephanie M. DeLong<sup>4</sup>, Catherine MacPhail<sup>2,5,6</sup>, Kathleen Kahn<sup>2,7</sup>, and Audrey Pettifor<sup>2,4</sup>**<sup>1</sup>Department of Medicine, Division of Prevention Science, Center for AIDS Prevention Studies, University of California, San Francisco, San Francisco, CA, USA<sup>2</sup>MRC/Wits Rural Public Health and Health Transitions Research Unit (Agincourt), School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa<sup>3</sup>Division of Epidemiology and Biostatistics, School of Public Health, University of California Berkeley, Berkeley, CA, USA<sup>4</sup>Department of Epidemiology, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA<sup>5</sup>School of Health and Society, University of Wollongong, Wollongong, NSW, Australia<sup>6</sup>Wits Reproductive Health and HIV Research Institute, University of the Witwatersrand, Johannesburg, South Africa<sup>7</sup>Umeå Centre for Global Health Research, Division of Epidemiology and Global Health, Department of Public Health and Clinical Medicine, Umeå University, Umeå, Sweden**Abstract**

**Background:** Intimate partner violence (IPV) is a human rights violation and is associated with a variety of adverse physical and mental health outcomes. Collective efficacy, defined as mutual trust among community members and willingness to intervene on the behalf of the common good, has been associated with reduced neighborhood violence. Limited research has explored whether community collective efficacy is associated with reduced incidence of IPV. This is of particular interest among adolescent girls and young women (AGYW) in sub-Saharan Africa, where the burden of HIV is greatest and IPV is common.

**Methods:** We collected longitudinal data among 2,533 AGYW (ages 13–20) enrolled in the HPTN 068 cohort in Mpumalanga province, South Africa between 2011–2016. We included participants from 26 villages where community surveys were collected during the HPTN 068 study.

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**COMPETING INTERESTS**

We have no competing interests to disclose.

Collective efficacy was measured at the village-level via two population-based cross-sectional surveys in 2012 and 2014. Multivariable Poisson generalized estimating equation regression models estimated the relative risk (RR) between village collective efficacy scores and subsequent physical IPV 12-month incidence, adjusting for village-level clustering and covariates.

**Results:** Thirty-eight percent of the cohort (N=950) reported at least one episode of recent physical IPV during follow-up. For every standard deviation higher level of collective efficacy, there was a 6% lower level of physical IPV incidence (aRR: 0.94; 95% CI: 0.89, 0.98) among AGYW after adjusting for covariates.

**Conclusions:** Community-level interventions that foster the development of collective efficacy may reduce IPV among AGYW.

### Keywords

Intimate partner violence; Collective efficacy; Adolescent girls and young women; South Africa

## INTRODUCTION

Intimate partner violence (IPV) refers to physical, sexual and emotional abuse perpetrated by a current or former intimate partner.<sup>1</sup> IPV is a human rights violation<sup>2</sup> and is associated with a number of negative health outcomes including physical injury, adverse mental health outcomes, and sexually transmitted infections, including HIV.<sup>3</sup> South Africa has a high burden of IPV. In 2016, 21% of women ages 18–49 years in South Africa reported ever experiencing physical IPV.<sup>4</sup> The rural province of Mpumalanga in the northeastern region of South Africa has the third highest prevalence of physical IPV in the country with an estimated 26% of women being lifetime survivors of physical IPV.<sup>4</sup> Adolescent girls and young women (AGYW) experience higher risk of physical IPV compared to older women in this context, with estimates suggesting that 37–39% of adolescent girls (15–19 years)<sup>5,6</sup> and 10% of young women ages 18–24 experience recent physical IPV,<sup>4</sup> compared to 7% among women aged 25 and older.<sup>4</sup> Such disparities may be due to AGYW's limited power in relationships due to their young age and relative inexperience, especially AGYW who are involved with older men.<sup>5</sup>

Over the past two decades, researchers have investigated how community level factors may influence IPV. Much of this work is grounded in Social Disorganization theory,<sup>7</sup> which posits that neighborhood poverty and residential instability limit the ability of communities to regulate crime.<sup>8</sup> It is thought that communities with fewer resources to sustain institutions such as churches, schools and organizations that bring communities together to form social bonds have less efficacy to monitor safety and work towards common goals, such as preventing crime.<sup>8</sup> Sampson and colleagues' (1997) construct of collective efficacy expands upon Social Disorganization theory to conceptualize how social processes among community members may influence the relationship between neighborhood factors and crime.<sup>9</sup> Collective efficacy refers to mutual trust and solidarity among community members (social cohesion), and willingness to intervene on behalf of the common good (social control).<sup>9</sup> Sampson (1997) theorized that the prevalence of dense social networks and participation in community groups contributes to the development of social solidarity and

trust among community members (social cohesion), which in turn promotes informal social control to monitor and regulate crime.<sup>9</sup>

Recently, researchers have explored the association of collective efficacy with IPV, primarily in urban settings across the United States (U.S.),<sup>9–14</sup> finding mixed evidence. Browning (2002)<sup>10</sup> and Wright & Benson (2011)<sup>11</sup> found that collective efficacy was associated with reduced reporting of IPV among adult women in the U.S. In contrast, Jain et al. (2010)<sup>13</sup> and Edwards et al. (2014)<sup>14</sup> found that collective efficacy was associated with reduced IPV victimization among male but not female youth in the U.S. Additionally, Wright et al. (2017) in the U.S. and Kirst et al (2015) in Canada, found no association between collective efficacy and IPV among adult women.<sup>12,15</sup> Systematic reviews on this topic have noted a dearth of evidence regarding the relationship between collective efficacy and IPV in non-U.S. and rural settings.<sup>7,16,17</sup> To our knowledge, no longitudinal study has examined this relationship in the sub-Saharan African context. Given that rates of IPV are high in this context, especially among AGYW, we examined the relationship between community-level collective efficacy and physical IPV incidence among AGYW in the rural province of Mpumalanga in South Africa. We hypothesized that AGYW living in communities with higher levels of collective efficacy would have lower 12-month incidence of physical IPV.

## METHODS

### Study Setting and Procedures

This analysis utilized data from three data sets collected from AGYW and their communities in the Mpumalanga province, South Africa. This rural area has high rates of unemployment, temporary labor migration and an extremely high HIV prevalence (19.4%).<sup>18,19</sup> The three data sets used for this analysis included: 1) a longitudinal cohort of AGYW participating in the HPTN 068 trial and their households; 2) two cross-sectional, representative community surveys conducted among 18–35 year olds in 26 communities where HPTN 068 took place; and 3) census data from the Agincourt Health and Socio-Demographic Surveillance System (HDSS), which is where both HPTN 068 and the community surveys took place. The data sources merged for this analysis are displayed in Figure 1.

HPTN 068 was a phase 3, randomized controlled trial of cash transfers conditional on school attendance among AGYW in the Bushbuckridge sub-district in Mpumalanga province, South Africa. The study area is the site of the Agincourt HDSS, where the Medical Research Council and University of the Witwatersrand Rural Public Health and Health Transitions Research Unit conduct an annual census.<sup>20</sup> AGYW ages 13–20 were eligible to participate in the HPTN 068 study if they were currently residing in the Agincourt HDSS study area and were enrolled in grades 8–11 at local government schools at the time of study enrollment, in 2011. After providing informed consent, members were randomized 1:1 to receive either a conditional cash transfer or the control condition. Participants in both arms completed an Audio Computer-Assisted Self-Interview (ACASI) and HIV counseling and testing at baseline and up to three annual follow-up visits during the trial, and an additional post-trial visit. Parents and guardians completed a Computer-Assisted Personal Interview to provide household-level data at baseline and each follow-up visit during the trial period. A detailed description of the 068 trial and cohort has been previously published.<sup>21</sup>

A community mobilization (CM) research program was rolled out in conjunction with the HPTN 068 trial in 11 randomly-selected villages in the Agincourt HDSS study area.<sup>22</sup> The CM intervention sought to challenge inequitable gender norms that contribute to IPV and HIV risk behaviors.<sup>22</sup> Two cross-sectional surveys were conducted to evaluate the 2-year CM program 2012 (n=1181), prior to the intervention, and in 2014 (n=1403) following the intervention.<sup>23,24</sup> A random sample of adults aged 18–35 years were selected from the census population and invited to participate in the surveys, with roughly 55 participants from each village at both time points. Eligible participants resided in the selected home, were 18–35 years of age, and lived in the study village for the majority of the past 12 months. All participants provided informed consent before participating in the study. A detailed description of the survey sampling and procedures has been published elsewhere.<sup>22</sup>

## Measures

**Outcome**—The outcome of interest, Physical IPV in the past 12 months, was measured at all visits in the HPTN 068 AGYW cohort using the previously validated 6-item World Health Organization (WHO) scale.<sup>25</sup> The scale measures 6 types of physical violence perpetrated by a partner, ranging from being slapped to the use of a weapon. In each survey (at enrollment and up to three subsequent follow-up visits, and the post-intervention visit), participants were asked if they had experienced each type of violence ever, and in the past 12 months. A binary variable was created to represent any or no experiences of physical IPV in the past 12 months. Reports of recent physical IPV at the enrollment visit were included as a covariate but not as an outcome, to ensure the exposure measure (community collective efficacy) pre-dated the reported IPV incident. Experienced sexual IPV was not assessed at all visits, and was therefore not included in this analysis due to lack of complete data or ability to ensure temporal ordering of the exposure-outcome relationship.

**Exposure**—The exposure of interest, collective efficacy, was measured in both community surveys in 2012 and 2014. This measure is composed of two domains: social cohesion and social control. It captures the level of trust and reciprocity among community members (social cohesion), and willingness to intervene on behalf of the common good (social control), as originally theorized by Sampson and colleagues.<sup>9</sup> All items were developed during qualitative research conducted among this population, pre-tested in a smaller survey, and then explored for reliability, item fit and model fit, factor structure, and internal and convergent validity in the 2012 survey (see Lippman et al (2016) for detailed information about the validation of these measures).<sup>26</sup> Cronbach's alpha for collective efficacy in this sample was 0.84, indicating high internal consistency. The social cohesion measure comprised 6-items, and participants rated how much they agreed with each statement using a 3-point Likert scale. An example social cohesion item includes “people in this village are willing to help their neighbors.” The social control measure was composed of 8-items, and participants used a 3-point Likert scale to rate how likely it would be that their neighbors would intervene in different situations. An example social control item includes “your neighbors would intervene if children were breaking windows on a local building or destroying public property.” Individual responses on the surveys were aggregated into mean collective efficacy scores for each village.

**Covariates**—Individual-level covariates of interest were measured among AGYW in the HPTN 068 cohort and included age at study entry, ever experiencing physical IPV at study entry (ever vs. never experienced physical IPV), and HPTN 068 study arm (intervention vs. control). HPTN 068 study arm was included as a covariate due to evidence suggesting that participation in the cash transfer program significantly reduced AGYW's risk for physical IPV.<sup>27</sup> Time-varying covariates included study visit, and current educational status (in school or graduated high school vs. not attending school or dropped out).

Household-level covariates were from the HPTN 068 household survey and included family household assets (the total number of durable goods from a list of 27 items each household owned) to assess the socio-economic status of AGYW and their families. Community-level covariates came from the census and included the proportion of the community who were permanent residents, the proportion of the community who were currently employed, and the mean socio-economic status (SES). The SES measure was derived from a list of household assets, access to water, housing material and owned livestock, with higher scores indicating more assets. These measures were strongly correlated, which led to create a combined measure of 'community characteristics' using principal components analysis (PCA). We used this combined measure to adjust for community-level confounders.<sup>28</sup> Higher scores on the combined measure reflect communities that are wealthier and have more permanent residents. We also adjusted for village randomization assignment from the community mobilization intervention, though findings were inconclusive as to whether the intervention impacted women's experience of IPV, suggesting a protective but not statistically significant result.<sup>23</sup>

## Analysis

Data from the HPTN 068 participant and household surveys, the two community surveys, and the Agincourt HDSS census were merged. We restricted the dataset to participants who reside in the villages included in the community survey. Specifically, of the 2,533 AGYW enrolled in the HPTN 068 cohort, 159 participants were excluded due to no available community data. A total of 2,374 AGYW residing in 26 villages were included in this analysis. Seventy-five participants were lost to follow-up for a total of 2,299 AGYW that contributed follow-up data. We structured the data for analysis so the collective efficacy measure preceded the IPV outcome.

We used bivariate Poisson regression with robust variance estimates to examine the association between the covariates and physical IPV in the past 12 months. Covariates were included in the multivariable analysis if they were identified as confounders a priori based on the literature. Generalized estimating equation (GEE) regressions with a Poisson distribution and robust variance estimates<sup>29</sup> were used to estimate the risk ratios (RRs) of physical IPV in the past 12 months by community collective efficacy, adjusting for relevant confounders and village-level clustering. The collective efficacy measure was rescaled for analysis using the pooled standard deviation for the 2012 and 2014 surveys in order to report RRs that represents the difference in physical IPV in the past 12 months associated with one standard deviation difference in the collective efficacy score.

The marginal modeling approach was used to estimate the difference in the predicted probability of IPV at the population level for a one standard deviation difference in collective efficacy score.<sup>30</sup> This was achieved by setting the collective efficacy (exposure) measure for all villages to one-half a standard deviation above and below the grand mean, and using the regression model to predict IPV under each circumstance. We then used clustered bootstrapping with 5,000 repetitions to generate bias-corrected 95% confidence intervals.

Institutional Review Board approval for HPTN 068, for the community surveys, and for merging the data sources for these analyses was obtained from the University of North Carolina at Chapel Hill (UNC) and the University of the Witwatersrand Human Research Ethics Committee. The University of California, San Francisco also approved the community surveys and protocols for merging data. All studies were conducted in accordance with the principles outlined in the Declaration of Helsinki.

## RESULTS

The mean age at entry into the HPTN 068 cohort was 15.5 years, and 17% had experienced physical IPV prior to study entry (Table 1). By the last follow up visit, approximately 88% had either graduated high school or were still in school. There were 950 AGYW who reported at least one incident of physical IPV over the course of the follow-up period. Community characteristics remained similar over time. The community collective efficacy scores decreased slightly overtime, however this change was not statistically significant.

The association between collective efficacy and physical IPV in the past 12 months is presented in Table 2. Collective efficacy was protective against incident physical IPV (RR: 0.94; 95% confidence interval (CI): 0.89, 0.98), indicating that for every standard deviation higher level of village-level collective efficacy, there was a 6% lower report of physical IPV among AGYW, after adjusting for covariates. Study visit, being enrolled in school or having graduated high school, and being in the HPTN 068 intervention arm were also protective against physical IPV. Older age and having ever experienced physical IPV at study entry were predictive of physical IPV incidence. Findings from the marginal modeling approach suggest that high community collective efficacy is associated with a 17.90% prevalence of IPV among AGYW, while low community collective efficacy is associated with a 18.83% prevalence of IPV. This yields a -0.93% prevalence difference of IPV (95% CI: -0.94, -0.92).

## DISCUSSION

In this study, community-level collective efficacy was associated with reduced incidence of physical IPV among AGYW South Africa. To our knowledge, this is the first study longitudinally examine the relationship between collective efficacy and IPV in the sub-Saharan African context. Prior research examining this relationship has been conducted primarily in North America.<sup>9-15</sup> The few studies that have considered the role of collective efficacy on health in sub-Saharan Africa have relied on cross-sectional study designs, have not used validated measures of collective-efficacy, or have measured it at the individual-level.<sup>31-33</sup> Our study adds to this body of work by demonstrating that a validated measure of

community-level collective efficacy is associated with reduced physical IPV incidence among AGYW in sub-Saharan Africa over time.

Limited research has also explored the relationship between collective efficacy and IPV among adolescents and young adults. Two longitudinal studies conducted in the U.S. found that collective efficacy was protective against IPV among young men but not young women,<sup>13,14</sup> however, one measured collective efficacy at the individual-level, operationalized as participant's perceptions of their community's collective efficacy,<sup>14</sup> which could explain the discrepant findings. It is also possible that there is something unique about community collective efficacy in the sub-Saharan African context that is protective against IPV among young women, though further research is needed to explore this relationship in other sub-Saharan African settings.

Prior research conducted in North America, has shed some light potential pathways linking collective-efficacy to IPV. First, communities with high levels of collective-efficacy may be more likely to intervene to stop IPV if they witness or hear violence occurring in the home,<sup>7,10,11</sup> and help survivors seek support.<sup>7</sup> Second, women living in communities characterized by high levels of collective efficacy may be motivated to report their experiences of violence because they perceive their community to be capable and willing to support them in addressing or preventing the violence.<sup>10,11</sup> Indeed, research suggests that survivors of violence who live in communities with high collective efficacy are more likely to report violence to the authorities and seek help from their community members,<sup>10</sup> thus reducing their risk for repeat violence. Third, the strong social bonds inherent within communities with high collective efficacy have the capacity to establish and promote norms that hinder IPV.<sup>7</sup> Community members can exert social control through disapproval of perpetrators of violence, ultimately deterring perpetrators from further abuse.<sup>7,11</sup> Again, future research is needed, including both qualitative and quantitative studies, to shed insight on the potential mechanisms linking collective efficacy to reduced rates of IPV among AGYW in the sub-Saharan African context.

This study was not without limitations. We were unable to assess sexual and emotional IPV because these variables were not measured at all follow-up visits. Prior research suggests that survivors of physical IPV often also experience sexual and emotional forms of violence from an intimate partner.<sup>34,35</sup> Sexual and emotional violence have also been associated with a number of negative health outcomes including increased risk for HIV (either through forced sex or increased sexual risk behaviors)<sup>36</sup> and poor mental health outcomes.<sup>35</sup> Thus, future studies should explore how community collective efficacy may influence these other forms of partner violence. Additionally, the self-report of IPV may have introduced differential bias into our findings. Because individuals living in neighborhoods with less collective-efficacy may be less likely to report experiences of violence,<sup>10,11</sup> participants from villages with lower collective efficacy scores may have underreported rates of IPV, which would bias our results towards the null. However, the use of ACASI in the 068 study may have mitigated this potential bias, given prior research documenting that participants are more comfortable disclosing sensitive information via ACASI.<sup>37</sup> Despite these limitations, our study had a number of strengths. First, we used multi-level, longitudinal data to explore how collective efficacy at the community-level affects IPV at the individual level over time.

Second, the community-level measures of social cohesion and social control were rigorously evaluated and performed well,<sup>26</sup> and third, we used pooled GEE regressions with robust variance estimates to account for clustering at the community level.

## CONCLUSION

Findings from this study support community mobilization efforts that facilitate the development of collective efficacy among community members to prevent and respond to IPV. Prior work from sub-Saharan Africa has sought to build social cohesion among communities through participatory workshops designed to develop social bonds and collective commitment to challenging inequitable gender norms, which are thought to contribute to IPV, and to prevent and respond to IPV in the community should it occur.<sup>38–40</sup> These efforts have been associated with reductions in IPV.<sup>39–41</sup> Our findings suggest that collective efficacy, which is a combination of social cohesion and social control, may play a role in these interventions. However, few, if any, of these past interventions measured collective efficacy directly to assess whether it is an underlying mechanism linking the intervention to reductions in IPV. Future research is needed to determine which intervention approaches successfully improve collective efficacy at the community level, and whether, that in turn, is associated with reductions in IPV. Furthermore, additional research is needed to explore the relationship between community-level collective efficacy and IPV among AGYW in other settings in sub-Saharan Africa to enhance our understanding of this relationship in this context.

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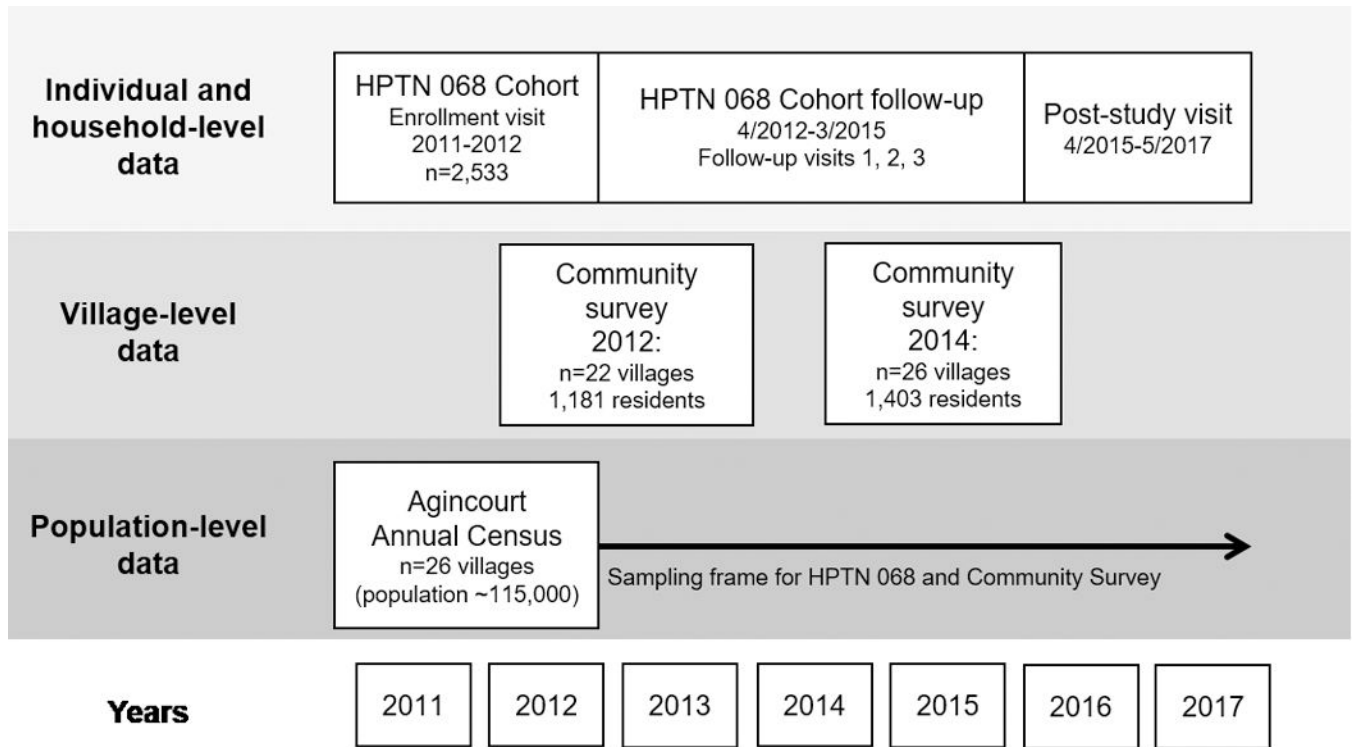
**SUMMARY BOX**

**What is already known on this subject?**

1. Past research, primarily conducted in urban settings in the United States, has demonstrated mixed evidence regarding the role of community collective efficacy in reducing intimate partner violence.
2. Multiple systematic reviews on this topic have highlighted the need for research in non-U.S. and rural settings.

**What this study adds**

1. Community collective efficacy was associated with reduced IPV incidence among adolescent girls and young women in rural area on South Africa.
2. Community-level interventions that foster the development of collective efficacy may reduce IPV among AGYW in sub-Saharan Africa and similar contexts.



**Figure 1.** Study schematic of three contributing data sources and data collection time lines in Agincourt, South Africa.

**Table 1.**

Characteristics of adolescents and young women enrolled in HPTN 068 (n=2,374) and their communities (n=26) in South Africa, 2011–2016

Participant characteristics	Baseline (n=2,374) n(%)	By end of follow-up (n=2,299) <sup>a</sup> n (%)
Mean age at entry into HPTN 068 (SD)	15.55 (1.66)	--
In school or graduated from high school	2,374 (100.00)	2,016 (87.69)
HPTN 068 intervention arm	1,185 (49.92)	1,123 (48.85)
Ever experience physical IPV at study entry	415 (17.48)	--
Physical IPV in ast 12 months	255 (10.74)	950 (41.32)
HIV status		
HIV negative	2,296 (96.71)	2,101 (91.39)
HIV positive	78 (3.29)	198 (8.61)
Mean number of household assets, (SD) (asked about 27 durable goods)	13.98 (6.79)	17.75 (7.12)
<b>Community characteristics</b>	<b>Unweighted Mean (SD) 2012</b>	<b>Unweighted Mean (SD) 2014</b>
% permanent residents <sup>b</sup>	62.36 (4.23)	59.81 (3.81)
Mean socio-economic status (SES) composite score <sup>b</sup>	0.09 (0.54) <sup>c</sup>	0.09 (0.52) <sup>d</sup>
% of community currently employed <sup>b</sup>	20.36 (1.79)	20.23 (1.70)
	<b>Weighted Mean (SD) 2012</b>	<b>Weighted Mean (SD) 2014</b>
Collective Efficacy score <sup>e</sup>	2.12 (0.14) <sup>f</sup>	1.81 (0.08) <sup>g</sup>

<sup>a</sup>n=75 participants lost to follow up

<sup>b</sup>Data from HDSS census

<sup>c</sup>Range: -0.81, 1.09

<sup>d</sup>Range: -0.81, 1.09

<sup>e</sup>Data from community surveys

<sup>f</sup>Range: 1.82, 2.38

<sup>g</sup>Range: 1.64, 1.97

**Table 2.**

Unadjusted and Adjusted Risk Ratios (RR) of physical IPV among adolescent girls and young women enrolled in HPTN 068 in South Africa (N=2,374), 2011–2016

Characteristics	Unadjusted RR (95% CI)	Adjusted <sup>a</sup> aRR (95% CI)
Individual level		
Age at enrollment	1.07 (1.05, 1.10) ***	1.07 (1.04, 1.09) ***
Time intervals (1 <sup>st</sup> follow up visit)		
2 <sup>nd</sup> follow-up	1.02 (0.91, 1.14)	0.85 (0.72, 1.02)
3 <sup>rd</sup> follow-up	0.86 (0.74, 1.00)	0.73 (0.59, 0.88) **
Post-intervention visit	0.41 (0.32, 0.51) ***	0.32 (0.24, 0.41) ***
Currently enrolled or graduated high school	0.52 (0.45, 0.60) ***	0.59 (0.49, 0.73) ***
Ever experience physical IPV at enrollment	1.79 (1.64, 1.95) ***	1.44 (1.32, 1.58) ***
HPTN 068 intervention arm - cash transfer vs. control	0.71 (0.65, 0.79) ***	0.69 (0.62, 0.76) ***
Household level		
Household assets	0.99 (0.99, 1.00)	0.99 (0.99, 1.00)
Community level		
<b>Collective efficacy</b>	<b>0.89 (0.86, 0.92) ***</b>	<b>0.94 (0.89, 0.98) **</b>
Community mobilization intervention village vs control	0.90 (0.78, 1.04)	0.91 (0.79, 1.04)
Community characteristics <sup>b</sup>	1.01 (0.96, 1.06)	0.99 (0.95, 1.03)

\* p<0.05

\*\* p<0.01

\*\*\* p<0.001

Bold typeface indicates the exposure of interest

<sup>a</sup>Model adjusted for all other covariates in the table

<sup>b</sup>Community characteristics is a collated measure of three community-level variables (mean socio-economic status (SES), proportion of the community who are currently employed, and proportion of the community who are permanent resident )