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## SPECIAL ARTICLE

## Intimate partner violence, abortion, and unintended pregnancy: Results from the WHO Multi-country Study on Women's Health and Domestic Violence

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## ABSTRACT

**Objective:** To explore how intimate partner violence (IPV) is associated with unintended pregnancy and abortion in primarily low- and middle-income countries. **Methods:** Population data are presented from 17 518 ever-partnered women participating in the WHO Multi-country Study on Women's Health and Domestic Violence in 15 sites in 10 countries. Using multiple logistic regression analyses, associations between physical and/or sexual partner violence and abortion and unintended pregnancy were explored. **Results:** Women with a history of IPV had significantly higher odds of unintended pregnancy in 8 of 14 sites and of abortion in 12 of 15 sites. Pooled estimates showed increased odds of unintended pregnancy (adjusted OR 1.69; 95% CI, 1.53–1.86) and abortion (adjusted OR 2.68; 95% CI, 2.34–3.06), after adjusting for confounding factors. Reducing IPV by 50% could potentially reduce unintended pregnancy by 2%–18% and abortion by 4.5%–40%, according to population-attributable risk estimates. **Conclusion:** IPV is a consistent and strong risk factor for unintended pregnancy and abortion across a variety of settings. Unintended pregnancy terminated through unsafe abortion can result in death or serious complications. Therefore, reducing IPV can significantly reduce risks to maternal and reproductive health.

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## 1. Introduction

Violence against women by intimate partners is increasingly recognized as a global public health problem. Efforts by activists, researchers, and policy makers from the grassroots to the international levels have drawn attention to this problem and led to the development of strategies to prevent violence and support women living with it. However, differences in definitions and study methodologies across countries have made it difficult to quantify intimate partner violence (IPV) globally and to make true cross-cultural comparisons on its prevalence and the consequences to women and their children.

In response to the lack of comparable data on the prevalence and impact of violence against women, the World Health Organization (WHO), in collaboration with international and local partners, undertook a large multicountry study in 10 countries using representative samples from 15 sites (a rural and/or urban site was selected in most countries, except Samoa where a national sample was used)

among more than 24 000 women, as described elsewhere [1,2]. The initial findings of the Multi-country Study on Women's Health and Domestic Violence against Women showed that between 15% and 71% of women aged 15–49 years who had been in a relationship had experienced physical and/or sexual violence by a partner in their lifetime, with most sites showing average prevalence rates between 30% and 60% [3]. Additional findings showed that women with a history of physical and/or sexual violence reported significantly more physical health problems, more pain, poorer self-rated health, more emotional distress, and suicidal ideation and attempts than women who had not experienced partner violence [4,5].

The high rates of IPV found in the study, as well as the associated health outcomes reveal the serious magnitude of this global public health problem. More investigation is needed, however, on the effects of partner violence on women's reproductive health in the study sites and to determine how the associations vary by site. The present paper provides the results of statistical analyses of data from 15 study sites in mainly low- and middle-income countries on the association between physical and/or sexual violence by a partner and unintended pregnancy and abortion.

It was hypothesized that heightened levels of fear and control, as well as sexual violence within abusive relationships, can result in women's inability to prevent pregnancy or to negotiate contraceptive

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methods, leading to unintended pregnancy. Previous studies have shown supporting evidence of the link between partner violence and unintended pregnancy [6–10]. Whether unintended pregnancies are carried to term or are terminated through induced abortion, having an unintended pregnancy has been associated with risks to maternal and perinatal health, particularly when these pregnancies are terminated in settings where abortion is unsafe [11]. Unsafe abortion is one of the leading causes of maternal mortality worldwide [12]. Even unintended pregnancies that are not terminated have also been associated with poor pregnancy outcomes [13,14] and poor child health outcomes, especially when the pregnancies are closely spaced [15].

If IPV is indeed a risk factor for unintended pregnancy and abortion then reductions in such violence should result in reductions in unintended pregnancies, as well as lower rates of unsafe abortion and maternal morbidity and mortality. The present paper discusses the potential effects of reductions in IPV.

## 2. Materials and methods

In the present analysis, data from the WHO Multi-country Study on Women's Health and Domestic Violence were analyzed. The study was approved by WHO's ethical review committee as well as by national and/or institutional review boards for each site, and all participants provided informed consent. A woman was considered abused if she reported having ever experienced physical or sexual violence, or both, by her partner. This included the following acts of moderate to severe physical violence and sexual violence: was slapped or had something thrown at her that could hurt her; was pushed or shoved; was hit with a fist or something else that could hurt her; was kicked, dragged, or beaten up; was choked or burnt on purpose; perpetrator threatened to use or actually used a gun, knife, or other weapon against her; was physically forced to have sexual intercourse when she did not want to; had sexual intercourse when she did not want to because she was afraid of what her partner might do; was forced to do something sexual that she found degrading or humiliating. The frequency and timing of the experiences (whether they happened in the past year or previously, or both) were captured. Having ever experienced any of these forms of violence was considered to be a positive value for the physical and/or sexual violence variable. While this analysis focuses on exploring the impact of physical and/or sexual partner violence, it is important to recognize that emotional abuse may also have a profound impact on women's health, although this issue will be explored in a later analysis.

For the abortion analysis, the sample was limited to the 17 518 women responding positively that they had ever been pregnant. Women who reported that they had ever been pregnant, were asked if they had ever had a pregnancy that ended in a spontaneous abortion, stillbirth, or induced abortion, and the number of pregnancies ending in each of those outcomes. The abortion variable was considered positive only for women stating that they had had an induced abortion. A separate paper will explore the other forms of pregnancy loss (spontaneous abortion and stillbirth) in relation to IPV and discuss the physiological mechanisms that can explain these associations.

The association between physical and/or sexual violence and unintended pregnancy was explored among the subgroup of 8922 women with a birth in the 5 years prior to the survey since only these women with a recent pregnancy were asked about pregnancy intendedness. The following question was asked of this subset of women, for the most recent pregnancy that resulted in a live birth that had occurred in the 5 years prior: "At the time you became pregnant with [child's name], did you want to become pregnant then, did you want to wait until later, did you want no (more) children, or did you not mind either way?" A pregnancy was considered unintended if the respondent stated that at the time she became pregnant she would have liked to have waited until later to become

pregnant (mistimed pregnancy) or that she did not want any (more) children (unwanted pregnancy). Recognizing the difficulty in establishing causality between IPV and pregnancy intendedness, the analysis was further limited to women for whom it could be established that any reports of IPV occurred in the same relationship as the pregnancy occurred (for women reporting multiple partners) based on relationship start and end dates and pregnancy dates reported. This strategy helped avoid overestimating the association between IPV and unintended pregnancy by excluding those associations that captured violence by a former partner and unintended pregnancy with a recent partner.

Before creating the multiple logistic regression models for each site, the association between physical and/or sexual partner violence and each of the dependent variables—abortion and unintended pregnancy—was explored in bivariate analyses for each site. Next, multiple logistic regression models were created for each of the study sites controlling for sociodemographic variables, such as age, socioeconomic status (values included low, middle, or high, using principal component analysis of indicators of household characteristics that varied by country), number of children, and education level [16]. Each of these variables was tested in the models using likelihood ratio tests to determine whether they were confounding factors and if their inclusion improved the model fit. Based on this model-building exercise, a final model was created that included the best combination of variables for that particular site. The results are presented as adjusted odds ratios.

Several methods were used to test whether there was a design effect due to the sampling strategy. First, the effect of clustered sampling was tested in the few sites where dependent variables showed significant intracluster correlation through multilevel multiple regression analyses. In the few sites where models including the cluster variable differed slightly from those where it was not included, the unclustered estimates were the more conservative and are presented in the present paper. Additionally, the potential design effect introduced by the selection of a single participant from each household (done for safety reasons) was tested by comparing weighted and unweighted estimates of prevalence of lifetime physical and/or sexual violence by a partner. The lack of significant evidence found for a design effect supports the use of unweighted samples [3], especially since the present paper presents data from a subset of the entire sample.

Finally, population-attributable fractions were calculated in Stata version 10 (Stata Corp, College Station, TX, USA) using covariate-adjusted population-attributable risk models by site and in a pooled analysis based on the adjusted odds ratios calculated in the multiple logistic regression models. The results estimate the proportions of unintended pregnancy and abortion attributable to IPV and the proportion of each that would be expected to be reduced if IPV were eliminated or reduced by half, adjusting for the covariates from the multiple logistic regression models.

## 3. Results

Table 1 gives the sociodemographic characteristics of the subgroup of ever-pregnant women. As would be expected, there is a large variation in the characteristics of women across sites. For example, 85% of women in Ethiopia province reported that they had no education compared with Thailand, where 50% of women in the capital had at least a secondary level of education. In most countries with 2 study sites, the differences between women in the city and those in the province were marked, with higher education and socioeconomic status and lower parity in the city sites compared with the province sites.

Among all women whose last pregnancy was within 5 years prior to the survey, 38% reported that the pregnancy was unwanted or mistimed at the time of the pregnancy (Table 2). Rates of unintended pregnancy varied between 13% in Samoa to 68% in Peru province. Higher rates of unintended pregnancy were found for women who

**Table 1**  
Sociodemographic characteristics of ever-pregnant women by study site.

Site	Education, %	Parity, %	Socioeconomic status, %
Bangladesh city (n = 1280)	None: 20.8	0: 4.8	Low: 73.7
	Primary: 19.8	1–2: 57.6	Mid: 20.0
	Secondary: 44.4	3–4: 28.4	High: 6.3
	Above: 15.1	≥5: 9.2	
Bangladesh province (n = 1273)	None: 42.2	0: 2.2	Low: 76.3
	Primary: 32.1	1–2: 33.7	Mid: 20.2
	Secondary: 24.6	3–4: 38.7	High: 3.5
	Above: 1.1	≥5: 25.4	
Brazil city (n = 791)	None: 2.9	0: 6.8	Low: 38.3
	Primary: 50.6	1–2: 64.7	Mid: 37.9
	Secondary: 29.3	3–4: 25.0	High: 23.9
	Above: 17.2	≥5: 3.4	
Brazil province (n = 1095)	None: 10.5	0: 3.6	Low: 28.2
	Primary: 66.9	1–2: 49.6	Mid: 62.2
	Secondary: 18.7	3–4: 30.2	High: 9.6
	Above: 3.9	≥5: 16.6	
Ethiopia province (n = 2182)	None: 85.3	0: 1.4	Low: 82.8
	Primary: 12.4	1–2: 17.2	Mid: 12.8
	Secondary: 1.4	3–4: 23.0	High: 4.4
	Above: 0.9	≥5: 58.4	
Japan city <sup>a</sup> (n = 902)	None: 0	0: 0	Low: 13.0
	Primary: 0	1–2: 78	Mid: 65.6
	Secondary: 43.0	3–4: 16.8	High: 21.4
	Above: 57.0	≥5: 5.2	
Namibia city (n = 1155)	None: 4.7	0: 4.1	Low: 29.5
	Primary: 20.4	1–2: 52.9	Mid: 27.4
	Secondary: 58.3	3–4: 28.2	High: 43.2
	Above: 16.6	≥5: 14.8	
Peru city (n = 355)	None: 0.9	0: 6.8	Low: 14.0
	Primary: 14.9	1–2: 53.0	Mid: 25.0
	Secondary: 43.1	3–4: 30.4	High: 61.0
	Above: 41.1	≥5: 9.9	
Peru province (n = 427)	None: 13.0	0: 2.7	Low: 45.7
	Primary: 51.1	1–2: 35.8	Mid: 37.0
	Secondary: 22.0	3–4: 24.9	High: 17.4
	Above: 14.0	≥5: 36.6	
Samoa <sup>b</sup> (n = 1148)	None: 0.4	0: 3.1	Low: 15.8
	Primary: 14.4	1–2: 30.0	Mid: 50.7
	Secondary: 79.8	3–4: 31.1	High: 33.5
	Above: 5.4	≥5: 35.9	
Serbia and Montenegro city (n = 909)	None: 0	0: 9.0	Low: 22.4
	Primary: 2.3	1–2: 80.4	Mid: 42.2
	Secondary: 49.8	3–4: 10.0	High: 35.5
	Above: 47.9	≥5: 0.7	
Thailand city (n = 907)	None: 2.1	0: 4.3	Low: 10.0
	Primary: 45.5	1–2: 75.3	Mid: 25.7
	Secondary: 31.4	3–4: 19.7	High: 64.3
	Above: 21.0	≥5: 0.8	
Thailand province (n = 955)	None: 4.7	0: 3.0	Low: 9.2
	Primary: 71.2	1–2: 71.8	Mid: 52.4
	Secondary: 14.8	3–4: 22.9	High: 38.4
	Above: 9.3	≥5: 2.3	
United Republic of Tanzania city (n = 1292)	None: 13.5	0: 8.1	Low: 65.6
	Primary: 64.8	1–2: 46.2	Mid: 23.0
	Secondary: 18.9	3–4: 26.7	High: 11.3
	Above: 2.9	≥5: 19.1	
United Republic of Tanzania province (n = 1198)	None: 24.5	0: 3.5	Low: 88.2
	Primary: 68.0	1–2: 37.1	Mid: 8.7
	Secondary: 7.4	3–4: 32.0	High: 3.1
	Above: 0.2	≥5: 27.4	

<sup>a</sup> Sample included women aged 18–49 years in Japan, but 15–49 in the other sites.<sup>b</sup> Entire country of Samoa sampled.

reported IPV compared with women who did not report IPV in all of the sites, and the differences were statistically significant everywhere except Samoa.

When the unintended pregnancy category was broken down into unwanted and mistimed pregnancies, more women who experienced IPV reported unwanted pregnancies in all of the sites compared with those who did not experience IPV. Mistimed pregnancies also tended to be more common among women reporting violence in all sites, except Bangladesh city and Brazil city and

province where women reporting violence were less likely to report a mistimed pregnancy.

Fig. 1 shows that, in general, women who had experienced physical and/or sexual IPV had higher rates of induced abortion compared with those who had not. The difference was statistically significant in 12 of 15 sites. Great variation was found across sites in rates of induced abortion, which relates to actual differences in abortion rates as well as differences in reporting abortion, both of which are related to the legality of abortion and cultural differences around pregnancy termination and associated stigma in the different settings. While overall the average percentage of women reporting abortion was 11%, less than 2% of women in Samoa, Ethiopia, and Namibia reported induced abortions. The highest reported abortion rates were in Serbia and Montenegro (51%), Japan (15%), and Bangladesh city (15%).

Because of the difficulty in capturing accurate abortion data in places where abortion is illegal or highly stigmatized, it is assumed that reported abortions are an underestimate of the total number of actual abortions. To explore the possibility that some abortions were reported as spontaneous abortions and stillbirths, a summary pregnancy loss variable was created to explore whether women in each site reporting IPV had higher rates of spontaneous abortion, stillbirth, and abortion combined. In each site, women who had reported ever experiencing physical and/or sexual violence had higher rates of pregnancy loss than women who reported no IPV (not shown). While IPV was also associated with spontaneous abortion, induced abortion accounted for most of the difference in pregnancy loss between women with IPV and those without IPV.

Results of the multivariate logistic regression analyses by site showed that physical and/or sexual partner violence was consistently associated with higher levels of unintended pregnancy and abortion in all of the sites, after controlling for age, education, socioeconomic status, and parity (Table 3). The associations were statistically significant in 8 of the 14 sites for unintended pregnancy and in 12 of 15 sites for abortion. In Thailand city, women with a history of physical and/or sexual partner violence had more than 3.5 times the odds of having an unintended pregnancy compared with women without a history of physical and/or sexual partner violence, and in Thailand province and Peru province the odds were more than twice as high.

In the pooled multiple logistic regression analyses of all sites, IPV was significantly associated with both of these reproductive health outcomes. The strongest association was for abortion, with women ever experiencing physical and/or sexual partner violence having almost 3 times the odds of having an abortion (adjusted OR 2.68; 95% CI, 2.34–3.06). Likewise, women reporting physical and/or sexual partner violence had almost twice the odds of having an unintended pregnancy (adjusted OR 1.69; 95% CI, 1.53–1.86).

The population-attributable fractions provide a measure of the percentage of unintended pregnancy and abortion in the population that could be attributed to physical and/or sexual partner violence and the corresponding percentage that would be eliminated if physical and/or sexual violence by partners was reduced. When all sites were combined, the proportion of unintended pregnancy that could be attributed to IPV was 15% and the proportion of abortion that could be attributed to IPV was 30%. As observed in Table 4, there is great variation in the population-attributable risk associated with IPV for each site. The percentage of unintended pregnancy attributed to IPV is 35% in Thailand city, but only 3% in Brazil city and the percentage of abortion attributed to IPV is 79% in Ethiopia province and only 9% in Serbia and Montenegro. If physical and sexual partner violence could be reduced by 50% in the study settings, the reductions in unintended pregnancy could be between 2% and 18% and the reductions in abortion between 4.5% and 40%.

#### 4. Discussion

The findings demonstrate significant associations between IPV and having an unintended pregnancy and/or abortion. While previous

**Table 2**  
Pregnancy intendedness of women who became pregnant in the last 5 years according to their experience of intimate partner violence, and overall.

Site		Intimate partner violence, %		Total
		Yes	No	
Bangladesh city (n = 633)	ANY unintended (mistimed/unwanted) <sup>c</sup>	43.0	28.2	36.6
	Mistimed	19.3	21.5	20.2
	Unwanted	23.7	6.7	16.4
	Wanted/didn't mind	57.0	71.9	63.4
	Missing/don't know	0	0	0
Bangladesh province (n = 673)	ANY unintended (mistimed/unwanted) <sup>a</sup>	35.7	26.1	32.2
	Mistimed	13.4	9.8	12.1
	Unwanted	22.3	16.3	20.1
	Wanted/didn't mind	64.3	73.9	67.8
	Missing/don't know	0	0	0
Brazil city (n = 307)	ANY unintended (mistimed/unwanted) <sup>a</sup>	62.2	49.3	53.1
	Mistimed	14.4	21.2	19.2
	Unwanted	47.8	28.1	33.9
	Wanted/didn't mind	37.8	50.7	46.9
	Missing/don't know	0	0	0
Brazil province (n = 452)	ANY unintended (mistimed/unwanted) <sup>b</sup>	65.0	51.9	56.6
	Mistimed	22.7	24.9	24.1
	Unwanted	42.3	27.0	32.5
	Wanted/didn't mind	35.0	48.1	43.4
	Missing/don't know	0	0	0
Ethiopia province (n = 1625)	ANY unintended (mistimed/unwanted) <sup>c</sup>	33.7	23.6	31.1
	Mistimed	19.9	14.8	18.6
	Unwanted	13.8	8.8	12.5
	Wanted/didn't mind	66.3	76.4	68.9
	Missing/don't know	0	0	0
Japan city (n = 355)	ANY unintended (mistimed/unwanted) <sup>a</sup>	30.2	17.9	19.7
	Mistimed	17.0	14.6	14.9
	Unwanted	13.2	3.3	4.8
	Wanted/didn't mind	69.8	81.1	79.4
	Missing/don't know	0	1	0.9
Namibia city (n = 610)	ANY unintended (mistimed/unwanted) <sup>c</sup>	59.9	42.2	48.9
	Mistimed	39.1	30.2	33.0
	Unwanted	20.8	12.0	14.9
	Wanted/didn't mind	40.1	57.1	53.6
	Missing/don't know	0	0.7	0.5
Peru city (n = 418)	ANY unintended (mistimed/unwanted) <sup>b</sup>	62.3	48.9	55.7
	Mistimed	30.7	26.3	28.7
	Unwanted	31.6	21.6	27.0
	Wanted/didn't mind	37.7	51.6	44.0
	Missing/don't know	0	0.5	0.2
Peru province (n = 926)	ANY unintended (mistimed/unwanted) <sup>c</sup>	74.1	54.3	67.8
	Mistimed	19.4	18.1	19.0
	Unwanted	54.7	36.2	48.8
	Wanted/didn't mind	25.9	45.7	27.7
	Missing/don't know	0	0	0
Samoa province (n = 789)	ANY unintended (mistimed/unwanted)	15.8	11.1	13.3
	Mistimed	9.4	7.7	8.5
	Unwanted	6.4	3.4	4.8
	Wanted/didn't mind	84.2	88.9	86.7
	Missing/don't know	0	0	0
Thailand city (n = 332)	ANY unintended (mistimed/unwanted) <sup>c</sup>	51.1	21.0	33.5
	Mistimed	27.0	13.3	19.0
	Unwanted	24.1	7.7	14.5
	Wanted/didn't mind	48.9	79.0	66.6
	Missing/don't know	0	0	0
Thailand province (n = 294)	ANY unintended (mistimed/unwanted) <sup>b</sup>	43.3	23.8	32.7
	Mistimed	29.9	13.8	21.1
	Unwanted	13.4	10.0	11.6
	Wanted/didn't mind	56.7	76.3	67.4
	Missing/don't know	0	0	0
United Republic of Tanzania city (n = 680)	ANY unintended (mistimed/unwanted) <sup>a</sup>	36.1	29.3	32.3
	Mistimed	26.4	25.0	25.7
	Unwanted	9.7	4.3	6.6
	Wanted/didn't mind	62.9	70.2	61.1
	Missing/don't know	1.0	0.5	0.7
United Republic of Tanzania province (n = 826)	ANY unintended (mistimed/unwanted) <sup>c</sup>	38.4	25.8	32.9
	Mistimed	28.8	20.4	25.1
	Unwanted	9.6	5.4	7.8
	Wanted/didn't mind	61.4	73.6	66.9
	Missing/don't know	0.2	0.5	0.4
ALL SITES (n = 8918)	ANY unintended (mistimed/unwanted) <sup>c</sup>	44.0	31.4	38.1
	Mistimed	21.4	18.9	20.2
	Unwanted	22.6	12.5	17.9
	Wanted/didn't mind	55.9	68.4	61.7
	Missing/don't know	0.1	0.3	0.2

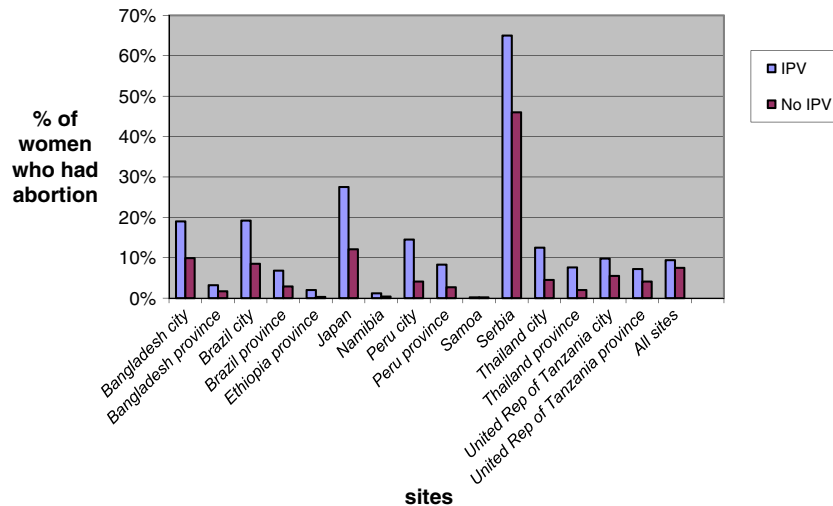


Fig. 1. Percentage of ever-pregnant women who had an abortion according to their experience of intimate partner violence (IPV).

research suggested that these outcomes were indeed associated with violence by an intimate partner [6–9,17–19], the present study shows the consistency of the results among a representative sample of participants from a variety of urban and rural sites in low-, middle-, and high-income countries. It is therefore important for healthcare providers in prenatal care and postabortion care settings to consider the role of IPV on their patients' health and to address this appropriately.

These findings have important public health implications because of the significant health burden associated with unintended pregnancies, especially those that end in abortions carried out in unsafe conditions. While these results are from a range of low-, middle-, and even high-income settings, they have particular relevance for women living in low- and middle-income countries since the majority of women in these countries live in settings where abortion services are highly restricted or unsafe. Evidence shows that legal restrictions actually tend to result in more unsafe abortions rather than reducing the total abortion rate [11]. Legal restrictions, in addition to poverty and stigma, result in poor women in low-resource countries having the highest rates of unsafe abortion and the highest burden of complications due to unsafe abortion [11]. Of the estimated 19.7 million unsafe abortions that occur worldwide, 19.2 million occur in low-resource countries [11] and many occur among adolescent and young women [20]. Addressing factors that contribute to unintended pregnancies and unsafe abortion is an important step in reducing the health burden of poor women worldwide.

Despite the significant findings presented here, a few limitations must be noted. While one of the strengths of this analysis is that it presents the effects of physical and sexual violence by an intimate partner on women's reproductive health in a population-based sample of women across a wide range of settings, broad cross-country analyses prevent more detailed analyses of the individual countries. Efforts were made in the WHO Study to ensure standardized and comparable data across sites; however, it is possible that the concepts studied differ in different settings. For example, cultural factors could affect how women interpret and respond to questions about unwanted and unplanned pregnancies, which could affect the observed associations presented here. When multiple settings are studied it becomes more difficult to hypothesize about possible under-

overreporting of certain measures in each setting, but the consistency of the findings across most sites provides evidence of the robustness of the measures.

Questioning women about sensitive topics, such as their experiences of violence, abortion, and pregnancy intendedness, can result in underreporting if they choose not to disclose. While steps were taken in the interviewer training to foster a safe, supportive environment for disclosure [21,22], which has been shown to reduce bias, [23] it is likely that some women have underreported these experiences, biasing the results toward weaker associations than actually exist.

Another limitation relates to the difficulty in establishing causality with data collected on a cross-sectional basis. While the findings presented here provide evidence of IPV being associated with two measures of reproductive health, it is only possible to hypothesize, not to confirm, that this violence actually led to the adverse events measured. For unintended pregnancy, only women for whom it could be confirmed that violence had occurred within the same relationship as the index pregnancy were included in the analysis since the variables relate to the most recent pregnancy only and data were collected on the start and end dates of current and previous relationships, as well as start dates of partner violence. For women reporting violence who have had an abortion, there was no way to determine whether the violence preceded the abortion and was a causal factor in the decision to terminate the pregnancy. A reverse causality in which abortion preceded violence is also plausible.

Because the unintended pregnancy questions were not asked of all women, but rather only of a subset of women with a pregnancy that resulted in a live birth in the 5 years prior to the survey, it was not possible to relate a particular unintended pregnancy with its outcome: abortion, live birth, or pregnancy loss. The lack of temporal data on the series of events that occurred presents a methodological challenge in drawing definitive conclusions on the pathways between IPV and these reproductive outcomes even given the significant associations found.

Previous research bolsters the evidence found in the present study on the link between IPV and abortion, by demonstrating that being in a relationship with an abusive partner can affect women's sexual decision making and control over contraceptive methods that can result in unintended pregnancy and abortion [10,24,25].

Notes to Table 2:

<sup>a</sup> Difference significant at  $\leq 0.05$ .

<sup>b</sup> Difference significant at  $\leq 0.01$ .

<sup>c</sup> Difference significant at  $\leq 0.001$ .

**Table 3**  
Association between lifetime physical or sexual partner violence and abortion and unintended pregnancy by study site.

Site	Unintended pregnancy among recently pregnant women, adjusted OR (95% CI)	Abortion among ever-pregnant women, adjusted OR (95% CI)
Bangladesh city	1.69* (1.19 – 2.39)	2.60* (1.84 – 3.69)
Bangladesh province	1.43 (1.0– 2.04)	2.05 (0.91 – 4.64)
Brazil city	1.33 (0.78 – 2.28)	3.16* (1.95 – 5.11)
Brazil province	1.54* (1.02 – 2.31)	2.42* (1.34 – 4.38)
Ethiopia province	1.64* (1.27 – 2.12)	6.46* (1.54 – 27.11)
Japan city	1.76 (0.89 – 3.47)	2.62* (1.71 – 4.02)
Namibia city	1.78* (1.24 – 2.56)	2.94 (0.69 – 12.48)
Peru city	1.49 (.99 – 2.24)	4.16* (2.43 – 7.15)
Peru province	2.25* (1.66 – 3.05)	3.65* (1.93 – 6.91)
Samoa	1.35 (0.88 – 2.05)	1.47 (0.9 – 24.20)
Serbia and Montenegro city	N.A.	2.24* (1.60 – 3.14)
Thailand city	3.68* (2.26 – 5.98)	3.22* (1.91 – 5.45)
Thailand province	2.16* (1.28 – 3.66)	5.39* (2.53 – 11.48)
United Republic of Tanzania city	1.33 (0.96 – 1.85)	1.91* (1.24 – 2.94)
United Republic of Tanzania province	1.65* (1.21 – 2.26)	1.79* (1.05 – 3.03)
All sites	1.69* (1.53 – 1.86)	2.68* (2.34 – 3.06)

Models adjusted for age, education, SES, and parity. Pooled model also controls for site.  
\* p ≤ .05.

As the population-attributable risk calculations highlight, reductions in IPV from evidence-based interventions can potentially result in significant improvements in women's health. Researchers in South Africa found that an intense intervention to promote microfinance with gender and HIV education contributed to a 55% reduction in the incidence of IPV [26]. Interventions working with men [27] or couples and communities [28] are also promising in reducing

**Table 4**  
Percentage of unintended pregnancy and abortion attributable to intimate partner violence.

Site	Unintended pregnancy attributable to IPV, %	Abortion attributable to IPV, %
Bangladesh city	17.7	38.8
Bangladesh province	14.2	37.8
Brazil city	3.4	30.7
Brazil province	6.2	33.2
Ethiopia province	23.6	79.1
Japan city	7.6	16.5
Namibia city	9.0	41.0
Peru city	9.0	58.5
Peru province	16.7	60.3
Samoa	12.4	15.9
Serbia and Montenegro city	NA	9.2
Thailand city	35.1	42.6
Thailand province	21.9	61.2
United Republic of Tanzania city	8.1	25.5
United Republic of Tanzania province	17.2	29.2
All sites	15.0	29.8

Abbreviation: IPV, intimate partner violence; NA, not applicable.

violence and reducing gender inequality that leads to violence. When IPV is reduced, reductions in associated outcomes would be expected as well. Therefore, given the strength of association found in the present study, the existing evidence from previous studies showing similarly significant findings, and the plausible mechanisms of causality between IPV and unintended pregnancy and abortion, the present findings suggest that a causal association is highly plausible.

In the case of such a causal association, reductions in IPV would potentially result in reductions in the adverse reproductive health outcomes of unintended pregnancy and abortion to the extent illustrated in the estimates of population-attributable risk. It is important to note that these estimates explain the relative contribution of IPV to unintended pregnancy and abortion while controlling for the effects of other factors included in these models, but it is not possible to predict precisely how much of a reduction would actually occur if IPV was reduced, or even eradicated, and these findings should be interpreted with caution. It is certain, however, that reductions in unintended pregnancies would result in fewer pregnancies ending in abortion, which would in turn reduce the morbidity and mortality associated with unsafe abortions.

The evidence provided in the present paper shows the impact of physical and/or sexual violence by an intimate partner on several dimensions of women's reproductive health, in particular the strong association between IPV and unintended pregnancy and abortion. It also shows that both unintended pregnancies and unsafe abortion could be substantially reduced if IPV rates were reduced. Given the health risks associated with unsafe abortion in many settings, programs and policies that prevent IPV would greatly contribute to improving women's reproductive health, in addition to efforts to make abortions safer and to address women's experiences of IPV in postabortion care. The time has come for greater recognition of the fact that beyond the visible physical bruises of violence lie the less visible yet potentially more debilitating consequences to women living in an environment where their physical, emotional, and reproductive health are at risk in both the short and long term.

### Conflict of interest

The authors have no conflicts of interest to declare.

### References

- [1] García-Moreno C, Watts C, Jansen H, Ellsberg M, Heise L. Responding to violence against women: WHO's Multicountry Study on Women's Health and Domestic Violence. *Health Hum Rights* 2003;6(2):112-27.
- [2] Garcia-Moreno C, Jansen HA, Ellsberg M, Heise L, Watts CH, WHO Multi-country Study on Women's Health, Domestic Violence against Women Study Team. Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *Lancet* 2006;368(9543):1260-9.
- [3] Garcia-Moreno C, Heise L, Jansen HA, Ellsberg M, Watts C. Public health. Violence against women. *Science* 2005;310(5752):1282-3.
- [4] Ellsberg M, Jansen HA, Heise L, Watts CH, Garcia-Moreno C, WHO Multi-country Study on Women's Health, Domestic Violence against Women Study Team. Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study. *Lancet* 2008;371(9619):1165-72.
- [5] Devries K, Watts C, Yoshihama M, Kiss L, Schraiber LB, Deyessa N, et al. Violence against women is strongly associated with suicide attempts: evidence from the WHO multi-country study on women's health and domestic violence against women. *Soc Sci Med* 2011;73(1):79-86.
- [6] Hindin MJ, Kishor S, Ansara DL. Intimate Partner Violence among Couples in 10 DHS Countries: Predictors and Health Outcomes. <http://www.measuredhs.com/pubs/pdf/AS18/AS18.pdf>; December 2008.
- [7] Pallitto CC, O'Campo P. Community level effects of gender inequality on intimate partner violence and unintended pregnancy in Colombia: testing the feminist perspective. *Soc Sci Med* 2005;60(10):2205-16.
- [8] Goodwin MM, Gazmararian JA, Johnson CH, Gilbert BC, Saltzman LE. Pregnancy intendedness and physical abuse around the time of pregnancy: findings from the pregnancy risk assessment monitoring system, 1996–1997. PRAMS Working Group. *Pregnancy Risk Assessment Monitoring System. Matern Child Health J* 2000;4(2):85-92.

- [9] Silverman JG, Gupta J, Decker MR, Kapur N, Raj A. Intimate partner violence and unwanted pregnancy, miscarriage, induced abortion, and stillbirth among a national sample of Bangladeshi women. *BJOG* 2007;114(10):1246-52.
- [10] Miller E, Jordan B, Levenson R, Silverman JG. Reproductive coercion: connecting the dots between partner violence and unintended pregnancy. *Contraception* 2010;81(6):457-9.
- [11] Singh S, Wulf D, Hussain R, Bankole A, Sedgh G. Abortion Worldwide: A Decade of Uneven Progress. <http://www.guttmacher.org/pubs/Abortion-Worldwide.pdf>; 2009.
- [12] World Health Organization. The World health report: 2005: make every mother and child count. <http://whqlibdoc.who.int/whr/2005/9241562900.pdf>; 2005.
- [13] Bustan MN, Coker AL. Maternal attitude toward pregnancy and the risk of neonatal death. *Am J Public Health* 1994;84(3):411-4.
- [14] Marsiglio W, Mott FL. Does wanting to become pregnant with a first child affect subsequent maternal behaviors and infant birth weight? *J Marriage Fam Plan* 1988;50(4):1023-36.
- [15] Khoshnood B, Lee KS, Wall S, Hsieh HL, Mittendorf R. Short interpregnancy intervals and the risk of adverse birth outcomes among five racial/ethnic groups in the United States. *Am J Epidemiol* 1998;148(8):798-805.
- [16] Vyas S, Kumaranayake L. Constructing socio-economic status indices: how to use principal components analysis. *Health Policy Plan* 2006;21(6):459-68.
- [17] Alio AP, Nana PN, Salihu HM. Spousal violence and potentially preventable single and recurrent spontaneous fetal loss in an African setting: cross-sectional study. *Lancet* 2009;373(9660):318-24.
- [18] Leung TW, Leung WC, Chan PL, Ho PC. A comparison of the prevalence of domestic violence between patients seeking termination of pregnancy and other general gynecology patients. *Int J Gynecol Obstet* 2002;77(1):47-54.
- [19] Pallitto CC, O'Campo P. The relationship between intimate partner violence and unintended pregnancy: analysis of a national sample from Colombia. *Int Fam Plan Perspect* 2004;30(4):165-73.
- [20] Grimes DA, Benson J, Singh S, Romero M, Ganatra B, Okonofua FE, et al. Unsafe abortion: the preventable pandemic. *Lancet* 2006;368(9550):1908-19.
- [21] Watts C, Heise L, Ellsberg M, Garcia Moreno C. Putting Women First: Ethical and Safety Recommendations for Research on Domestic Violence Against Women. <http://www.who.int/gender/violence/womenfirtseng.pdf>; 2001.
- [22] Jansen HA, Watts C, Ellsberg M, Heise L, Garcia-Moreno C. Interviewer training in the WHO Multi-Country Study on Women's Health and Domestic Violence. *Violence Against Women* 2004;10(7):831-49.
- [23] Ellsberg M, Heise L, Peña R, Agurto S, Winkvist A. Researching domestic violence against women: methodological and ethical considerations. *Stud Fam Plann* 2001;32(1):1-16.
- [24] Emenike E, Lawoko S, Dalal K. Intimate partner violence and reproductive health of women in Kenya. *Int Nurs Rev* 2008;55(1):97-102.
- [25] Fanslow J, Silva M, Whitehead A, Robinson E. Pregnancy outcomes and intimate partner violence in New Zealand. *Aust N Z J Obstet Gynaecol* 2008;48(4):391-7.
- [26] Pronyk PM, Hargreaves JR, Kim JC, Morison LA, Phetla G, Watts C, et al. Effect of a structural intervention for the prevention of intimate-partner violence and HIV in rural South Africa: a cluster randomised trial. *Lancet* 2006;368(9551):1973-83.
- [27] Barker G, Ricardo C, Nascimento M. Engaging men and boys in changing gender-based inequity in health: Evidence from programme interventions. [http://www.who.int/gender/documents/Engaging\\_men\\_boys.pdf](http://www.who.int/gender/documents/Engaging_men_boys.pdf); 2007.
- [28] Jewkes R, Nduna M, Levin J, Jama N, Dunkle K, Puren A, et al. Impact of stepping stones on incidence of HIV and HSV-2 and sexual behaviour in rural South Africa: cluster randomised controlled trial. *BMJ* 2008;337:a506.

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