Prevalence of and factors associated with male perpetration of intimate partner violence: findings from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific

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Summary

Background Male perpetration of intimate partner violence (IPV) is under-researched. In this Article, we present data for the prevalence of, and factors associated with, male perpetration of IPV from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific. We aimed to estimate the prevalence of perpetration of partner violence, identify factors associated with perpetration of different forms of violence, and inform prevention strategies.

Methods We undertook standardised population-based household surveys with a multistage representative sample of men aged 18–49 years in nine sites in Bangladesh, China, Cambodia, Indonesia, Sri Lanka, and Papua New Guinea between January, 2011, and December, 2012. We built multinomial regression models of factors associated with lifetime violence perpetration: physical IPV, sexual IPV, both physical and sexual IPV, multiple emotional or economic IPV versus none, and calculated population-attributable fractions. In the analysis, we considered factors related to social characteristics, gender attitudes and relationship practices, victimisation history, psychological factors, substance misuse, and participation in violence outside the home.

Findings 10 178 men completed interviews in our study (between 815 and 1812 per site). The response rate was higher than 82·5% in all sites except for urban Bangladesh (73·2%) and Sri Lanka (58·7%). The prevalence of physical or sexual IPV perpetration, or both, varied by site, between 25·4% (190/746; rural Indonesia) and 80·0% (572/714; Bougainville, Papua New Guinea). When multiple emotional or economic abuse was included, the prevalence of IPV perpetration ranged from 39·3% (409/1040; Sri Lanka) to 87·3% (623/714; Bougainville, Papua New Guinea). Factors associated with IPV perpetration varied by country and type of violence. On the basis of population-attributable fractions, we show factors related to gender and relationship practices to be most important, followed by experiences of childhood trauma, alcohol misuse and depression, low education, poverty, and involvement in gangs and fights with weapons.

Interpretation Perpetration of IPV by men is highly prevalent in the general population in the sites studied. Prevention of IPV is crucial, and interventions should address gender socialisation and power relations, abuse in childhood, mental health issues, and poverty. Interventions should be tailored to respond to the specific patterns of violence in various contexts. Physical and sexual partner violence might need to be addressed in different ways.

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Introduction

Intimate partner violence (IPV) is the most prevalent form of violence against women worldwide, with major health consequences for women and substantial social and economic costs for governments, communities, and individuals.[1,2] Studies have shown that between 20% and 68% of women aged 15–49 years have experienced physical or sexual violence, or both, from a male intimate partner in their lifetime.[3–7] Recent systematic reviews suggest that women's experiences of IPV are associated with young age, low education, exposure to child maltreatment, harmful use of alcohol, acceptance of violence, educational disparity between partners, and marital discord.[8,9]

Until now, research into male perpetration of IPV has been quite scarce because interviewing of women to understand the scale and scope of the problem has understandably been prioritised. Perceived methodological challenges have occurred in gathering of accurate information from men about their use of violence, and differences in research methods have made comparisons of findings between settings difficult. However, existing population-based studies suggest a prevalence of male perpetration of lifetime physical partner violence ranging

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from 24% in Brazil to 42% in South Africa.[10,11] In the Asia-Pacific region, 46% of married men in northern India and more than one in three men in a study in Bangladesh reported perpetration of physical violence, sexual violence, or both against their wives in the past 12 months.[12,13]

The UN Multi-country Cross-sectional Study on Men and Violence was developed by Partners for Prevention, a UN Development Programme, UN Population Fund, UN Women, and UN Volunteers regional joint programme for prevention of gender-based violence in Asia and the Pacific. The study aims to estimate the prevalence of perpetration of partner violence, identify factors associated with perpetration of different forms of violence, and inform prevention strategies. With increasing recognition that prevention of IPV must include work with boys and men at all levels of a multisectoral approach,[14] this study fills a crucial knowledge gap.

In this Article, we present the prevalence of men's reports of perpetration of physical, sexual, and multiple emotional or economic abuse against a female intimate partner, and the factors associated with such perpetration from nine diverse sites in six countries in Asia and the Pacific: Bangladesh, China, Cambodia, Indonesia, Papua New Guinea, and Sri Lanka. Panel 1 shows the operational definitions of the types of violence measured and the outcome variables.

Methods

Study design and participants

The study was coordinated by Partners for Prevention in collaboration with the Medical Research Council of South Africa and the study teams in each country. The national study teams comprised a research institution with experience in population surveys, and a UN or civil society agency who provided funding and coordination. A technical advisory group of experts, including staff from WHO, advised on the methodology. A regional steering committee made decisions about data analysis and ethics standards. National working groups with representatives from governments, civil society, the UN, and researchers supported study implementation and dissemination.

We used a standardised structured questionnaire in the study, which we derived from the South African Medical Research Council's Men's Health and Relationships Study,[11] the WHO Multi-country Study on Women's Health and Domestic Violence against Women,[3] and the International Men and Gender Equality Survey.[10] The translated questionnaires were validated through cognitive interviews and were piloted at each study site. The validity of the questionnaire is supported by high Chronbach's α values for the measurements of intimate partner violence (panel 1) and other important scales (appendix pp 1–3). The validity of the prevalence of IPV perpetration is further supported by reports from women in six of the study sites where, in all but two sites, the confidence intervals for men's and women's reports overlapped.[15]

See Online for appendix

We asked questions about IPV perpetration to men who had been married, cohabited, or had a girlfriend (ever-partnered men); these questions were South African adaptations from the WHO Multi-country Study (panel 1).[3,11] The questions about sexual IPV focused on forced and coerced sex—ie, partner rape. All questions were framed around specific acts and asked about the frequency of perpetration (once, a few times, or many times). At the end of the series of questions about each type of violence, men were asked about their perpetration in the past 12 months. At the beginning of the sections that contained questions about perpetration in the questionnaire, additional introductions drew attention to the confidential nature of the study and emphasised that the questions to come might be difficult to discuss.

We measured gender attitudes with a combination of the gender-equitable men scale[16] and questions about men's attitudes towards gender from the Medical Research Council men's health and relationships study.[11] Appendix pp 1–3 describe gender attitudes and other potential factors associated with male IPV perpetration, and we selected these factors on the basis of existing published work.[10–13,17–20] Research suggests that risk factors associated with male perpetration of violence against a female partner include poverty, a low level of education, exposure to childhood trauma, alcohol misuse, antisocial personality disorder, attitudes that condone violence, relationship discord, and having several partners.[12,13,16,19,20] Some debate exists as to whether quarrelling and controlling behaviour should be viewed as a component of partner violence, but other studies have regarded them as potential risk factors.[18,21] Although possibly closely related to emotional abuse, quarrelling and controlling behaviour do not always co-occur with physical or sexual violence.

All interviews were done face-to-face in local languages by trained male interviewers who used personal digital assistants to enter data. The most sensitive questions about sexual violence perpetration were self-administered with the audio-enhanced function of the personal digital assistants. In China, the entire survey was self-administered to ensure privacy and because of particular political sensitivities.

Sample design

We completed standardised population-based household surveys about men's health and use of different forms of violence between January, 2011, and December, 2012, in the nine sites. The sampled countries represent the diversity of the region, including sites from south Asia, southeast Asia, east Asia, and the Pacific, including two post-conflict sites (Bougainville, Papua New Guinea, and Jayapura, Indonesia). In most sites, we either sampled the whole area (Cambodia, and

Bougainville in Papua New Guinea) or one urban site—the capital city—and one rural site (in Bangladesh and Indonesia). The Chinese site was a county in central China with urban and rural areas, whereas in Sri Lanka, we surveyed Colombo and three contrasting districts, from which the data were pooled to create an overall sample. Apart from Cambodia and Bougainville, Papua New Guinea, the samples are not intended to be nationally or regionally representative. Appendix pp 4–5 provide a description of the study sites.

Table 1 shows details of the sample design by site. In all sites, we obtained a representative sample of men aged 18–49 years from households with use of multistage cluster sampling. We excluded men older than 49 years to reduce recall bias and to avoid the heightened sensitivity about discussion of sexual matters in this older age group. We established that a minimum sample size of 1000 was needed on the basis of required levels of statistical power to meet the study objectives,[15] but in some countries, the research teams chose to use larger samples. We selected clusters with probability proportionate to size, within which we systematically selected households. We randomly selected one eligible man from each household. In China, a list of individuals in each cluster by age and sex was available and therefore we used this list for sampling within selected clusters. We did not do any replacements for absent or non-responding households or individuals.

Panel 1: **Operational definitions of the types of violence measured and the outcome variables**

Physical violence against an intimate partner (Chronbach's α=0·762)

- Slapped a partner or thrown something at her that could hurt her
- Pushed or shoved a partner
- Hit a partner with a fist or with something else that could hurt her
- Kicked, dragged, beaten, choked, or burned a partner
- Threatened to use or actually used a gun, knife, or other weapon against a partner

Sexual violence against an intimate partner (no Chronbach's α provided because only two questions)

- Forced partner to have sexual intercourse with you when she did not want to
- Had sexual intercourse with partner when you knew she didn't want to but you believed she should agree because she was your wife/partner

Emotional abuse against an intimate partner* (Chronbach's α=0·743)

- Insulted a partner or deliberately made her feel bad about herself
- Belittled or humiliated a partner in front of other people
- Done things to scare or intimidate a partner on purpose—eg, by the way you looked at her, by shouting, or by smashing things
- Threatened to hurt a partner
- Hurt people your partner cares about as a way of hurting her, or damaged things of importance to her

Economic abuse against an intimate partner* (Chronbach's α=0·486)

- Prohibited a partner from getting a job, going to work, trading, or earning money
- Taken a partner's earnings against her will
- Thrown a partner out of the house
- Kept money from your earnings for alcohol, tobacco, or other things for yourself when you knew your partner was finding it hard to afford the household expenses

Outcome variables

Physical only partner violence perpetration

Respondent perpetrated at least one act of physical violence against an intimate partner in their lifetime but no acts of sexual violence against an intimate partner. Overlaps with emotional/economic abuse in that they could have also perpetrated this type of abuse, but only if in combination with physical violence.

Sexual only partner violence perpetration

Respondent perpetrated at least one act of sexual violence against an intimate partner in their lifetime but no acts of physical violence against an intimate partner. Overlaps with emotional/economic abuse in that they could have also perpetrated this type of abuse, but only if in combination with sexual violence.

Both physical and sexual partner violence perpetration

Respondent perpetrated at least one act of physical violence and at least one act of sexual violence against an intimate partner in their lifetime. This includes some overlap with emotional/economic abuse.

Multiple emotional/economic only partner violence perpetration

Respondents perpetrated more than one act of emotional or economic abuse, or one act several times, against an intimate partner in their lifetime. However, they never perpetrated physical or sexual violence, or both, against an intimate partner. We defined it as frequent emotional/economic abuse if in terms of frequency the respondent reported 3 or more "once" responses; more than 1 "few" responses; 1 "few" and 1 "once" response; or a "many" response to one question. We included only emotional or economic abuse that occurred several times because of uncertainty about whether a one-off act of this type would have an enduring effect on victims.

*Study of the Eigen values generated from the factor analysis of the combined emotional and economic abuse scales shows that these scales can be reduced to one factor. We therefore have combined these into one emotional/economic scale, resulting in a Chronbach's α of 0·752.

	Ethics approval	Sample design	Number of strata	Number of clusters	Total number of eligible households	Number of completed interviews (individual response rate %*)
Bangladesh						
Rural site	icddr,b ethics review committee	Villages were stratified into large, medium, and small categories. Villages were selected using PPS, and within each village 30 households were sampled randomly from household lists obtained from icddr,b's demographic and health surveillance database	1	65 villages	1233	1146 (92·9%)
Urban site	icddr,b ethics review committee	Mohallas (neighbourhoods) were stratified by size and selected with PPS drawn from the Bangladesh Bureau of Statistics 2011. Simple random sampling was used to select one enumeration area (consisting of about 120 households on average) from each mohalla. Households were systematically sampled from each enumeration area	1	50 mohallas	1712	1254 (73·2%)
Cambodia	National Ethics Committee for Health Research, Ministry of Health	Random sampling of villages (census areas) in each province with PPS, and systematic sampling of households within villages	2 of 4 subregions were randomly selected, then 2 provinces per region selected with PPS (Kampot, Sihanoukville, Siem Reap, and Battambang), plus Phnom Penh	113 villages	1863	1812 (97·3%)
China, urban/rural site	College of Humanities, Beijing Forestry University	Sampling units were village committees or neighbourhood committees. With the selected units, eligible people were systematically sampled from the population register	2	75, but sample implementation resulted in selection of 67 communities with PPS because 8 were selected twice	1233	1017 (82·5%)
Indonesia						
Rural site	Medical and Health Research Ethics Committee, Ministry of National Education	Clusters were census units selected using PPS	1	40 clusters per site	873	815 (94·5%)
Urban site	Medical and Health Research Ethics Committee, Ministry of National Education	Clusters were census units selected using PPS	1	40 clusters per site	945	868 (91·9%)
Jayapura	Medical and Health Research Ethics Committee, Ministry of National Education	Clusters were census units selected using PPS	1	40 clusters per site	947	884 (93·3%)
Papua New Guinea: Bougainville	South African Medical Research Council Ethics Committee	Clusters were census units; within these units, households were systematically selected from household lists	3 regions (north, central, south) and 3 categories of village size	150	1014	864 (85·2%)
Sri Lanka	Sri Lanka Medical Association	Within each district, a random sample of electoral areas was taken, and within each area, 8 Grama Niladari divisions (polling booths) were selected, using PPS	4 districts (Colombo, Nuwara Eliya, Hambantota, and Batticoloa) purposely selected; the sample was stratified by (randomly selected) electorates and within each district, with 5 strata in Colombo, 4 in Nuwara Eliya, 4 in Hambantota, and 3 in Batticoloa	81 clusters in total	2656	1560 (58·7%)

icddr,b=International Centre for Diarrhoeal Disease Research, Bangladesh. PPS=probability proportional to size. *Total number of completed interviews as a percentage of the number of households with eligible men.

***Table 1*: Sample design and individual response rates, by site**

Ethics and safety guidelines for research into men's violence perpetration were developed for this study,[22] which were based on previous field experiences and the WHO ethics and safety guidelines for research with women.[23] The interviewees received an information sheet and gave signed consent. To ensure confidentiality, we kept no household lists with identifying details of respondents. At the end of the interview, all participants received a leaflet detailing local support services for health, domestic violence, and sexual abuse. Ethics

approval was provided by the Medical Research Council of South Africa Ethics Committee, and local institutions or national ethics boards in each country (table 1).

Data entry and statistical analysis

We combined and analysed the datasets with Stata version 12.0. In all procedures, we took into account the multistage structure of the dataset, with stratification by site within a country and enumeration areas as clusters. We summarised data for male perpetration of IPV and explanatory variables as percentages (or means), and we calculated 95% CIs with standard methods (Taylor linearisation). We used Pearson's χ^2 test to analyse associations between categorical variables. 131 of 10 178 (1·3%) participants had missing data on the gender-equitable men scale and 611 of 8000 (7·6%) participants who had ever had sex had missing data for the number of lifetime sexual partners. In cases for which the gender-equitable men scale had only one missing item, an average taken from the rest of the scale was used to replace the missing value. If more than one value was missing, no replacement was made. For partner numbers, we first established that data were missing at random, then imputed data with Stata's multiple imputation methodology. Very few data were missing for other variables so no other replacements were done. We compared unweighted prevalence rates of all types of violence perpetration with prevalence weighted for the number of eligible men in a household in all countries except China (where sampling was of individuals) and recorded no significant difference. The analysis presented in this report is not weighted.[15]

Men in the physical violence category had used one or more act of physical violence but had never used sexual violence (and vice versa for the sexual violence category). Those who had used both physical and sexual IPV are categorised together. Men who had perpetrated more than one act of emotional or economic abuse or one act several times (and had not been physically or sexually violent) were grouped together. When overlap occurred between emotional or economic and physical violence, we classified the IPV as physical violence because the violence no longer took only a psychological form. The same situation applies for overlap between emotional or economic and sexual violence. Appendix p 6 shows the overlap between different types of violence.

For each country, we present the population prevalence rates by site, except when the sample was nationally representative. When presenting factors associated with violence perpetration, we pool the sites within a country, and have pooled the data from all countries for a combined analysis of the dataset, adjusted by site. Other published work suggests that physical and sexual partner violence often overlap and thus these outcomes are often analysed together.[3,17] However, our preliminary analysis showed that patterns of partner violence varied between sites, and associations related to these outcomes were different. Thus, we used multinomial regression to study differences in association by outcome in one concise model, which has previously been absent from the scientific literature. Multinomial logistic regression aims to construct a model that explains the relation between the explanatory variables and the (five) categorical, but not ordered, violence outcomes. In the process, it explains the relative effect of independent variables on the outcomes with relative risk ratios (which are similar to odds ratios but instead of using a base case, they use one outcome (in this case, "never perpetrated IPV") against which the four others are compared separately. We fitted maximum likelihood multinomial logit models for complex survey data to compare factors associated with mutually exclusive outcomes: physical violence only, sexual violence only, both physical and sexual violence, and multiple emotional or economic partner violence only, in which never having committed any of these forms of IPV was the base condition. Lifetime prevalence was used in all regression analyses because it gives more power to the analysis and avoids suggesting that previously violent men are in some way the same as never violent men. Backwards elimination was used initially for variables of $p=0·2$ or greater, and for the fully adjusted parsimonious models generated for each country the final model variables were retained at $p\leq0·05$.

Based on the work of Greenland,[24] we calculated population-attributable fractions (PAFs) for IPV perpetration to estimate the importance of associated factors, by combining the strength of association (in this case relative risk ratios) and the prevalence of the variable.

Role of the funding source

The sponsors of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. EF, RJ, and TR had access to all the data in the study, and all authors had final responsibility for the decision to submit for publication.

Results

The study achieved a high individual response rate of higher than 82·5% (1017/1233) in all settings except for urban Bangladesh (73·2%) and Sri Lanka (58·7%; table 1). In total, we interviewed 10 178 men aged 18–49 years, of whom 8006 were ever-partnered (between 714 and 1390 per site) and thus completed questions about their use of IPV.

A comparison with population age and education distributions from available censuses showed that in rural Bangladesh our sample was a little older than the general population and in Sri Lanka, younger (appendix pp 7–8). For other sites, our sample from each site was very similar in age structure to the general population. In all settings, our sample was more educated than the general population, except in Papua New Guinea where no data for education were available. Although direct

	Total number of ever-partnered men sampled	No violence*	Physical violence only*	Sexual violence only*	Both physical and sexual violence*	Multiple emotional/ economic violence*
Bangladesh: rural site	824	39·4% (36·3–42·7)	41·7% (38·0–45·6)	5·2%† (3·9–6·9)	9·8% (7·5–12·7)	3·8% (2·5–5·7)
Bangladesh: urban site	737	37·2% (31·9–42·8)	44·6% (39·4–50·0)	2·8%† (1·9–4·2)	7·6% (5·6–10·2)	7·7% (5·7–10·5)
Cambodia	1390	42·6% (39·6–45·7)	12·1% (10·2–14·2)	16·5% (14·6–18·7)	4·5% (3·6–5·7)	24·2% (22·0–26·7)
China: urban/rural site	930	44·2% (40·7–47·8)	32·2% (28·9–35·6)	6·8% (5·5–8·4)	12·6% (10·7–14·8)	4·3% (3·3–5·6)
Indonesia: urban site	785	51·2% (47·6–54·8)	6·1% (4·4–8·5)	17·7% (14·4–21·6)	6·5% (4·7–8·9)	18·5% (15·1–22·4)
Indonesia: rural site	746	58·7% (54·4–62·9)	7·4% (5·7–9·4)	14·1% (11·8–16·7)	3·9% (3·0–5·0)	16·0% (12·9–19·5)
Indonesia: Jayapura	840	29·3% (24·7–34·3)	16·1% (12·3–20·8)	22·3% (20·3–24·4)	21·4% (16·7–27·0)	11·0% (8·4–14·2)
Papua New Guinea: Bougainville	714	12·7% (9·7–16·5)	20·6% (17·4–24·2)	18·2% (15·5–21·3)	41·2% (36·8–45·7	7·3% (5·4–9·7)
Sri Lanka	1040	60·6% (57·1–63·9)	16·3% (14·1–18·9)	9·5% (7·7–11·8)	6·7% (5·0–9·1)	6·8% (5·4–8·6)
Total for combined sample	8006	42·6% (41·2–44·0)	21·2% (19·9–22·4)	12·7% (11·9–13·5)	11·8% (10·8–12·7)	11·8% (11·0–12·7)

Data are n or % (95% CI). *Violence categories are mutually exclusive. No violence=never perpetrated physical violence, sexual violence, both, or multiple emotional or economic violence. Physical violence only=perpetrated physical partner violence but never sexual violence (includes overlap with multiple emotional/economic violence). Sexual violence only=perpetrated sexual partner violence but never physical partner violence (includes overlap with multiple emotional/economic violence). Both physical and sexual violence=perpetrated both physical and sexual partner violence (overlap with multiple emotional/ economic violence). Multiple emotional or economic violence only=perpetrated emotional/economic violence but never perpetrated physical or sexual partner violence. †Bangladesh was the first country to undertake the study and after that experience, the questions on sexual partner violence were expanded to include a question on coerced sex. Therefore, some disparity exists between the sexual violence questions used in Bangladesh versus those used in other sites.

Table 2: **Lifetime prevalence of men's perpetration of different types of violence against an intimate female partner, among ever-partnered men, by site**

comparison of the sample with the general population is difficult because of differences in age range and the year in which the data were collected, our sample in each country is quite similar to the overall population, although slightly better educated. This fact supports the quality of the sample in each country and generalisability of findings for that country.

Table 2 shows the proportion of ever-partnered men at each site who disclosed having ever perpetrated physical violence, sexual violence, both physical and sexual violence, and multiple emotional or economic violence against a female partner. The violence categories are mutually exclusive, as shown in appendix p 6. The proportion of ever-partnered men who reported perpetrating physical violence, sexual partner violence, or both, against a partner varied between 25·4% (190/746) in the Indonesian rural site and 80·0% (572/714) in Bougainville, Papua New Guinea, but in most sites the proportion was between 30·3% and 56·7% (table 2). The proportion of men who committed economic or emotional abuse several times against a partner but had not been physically or sexually violent varied between 3·8% and 11·0% in six out of the nine sites; however, we recorded substantially higher rates in Cambodia (24·2%; 337/1390) and the rural and urban sites in Indonesia (ranging between 16·0% and 18·5%; table 2). Between 3·9% (29/746; rural Indonesia) and 41·2% (294/714; Bougainville, Papua New Guinea) of ever-partnered men reported that they had used both physical and sexual partner violence (table 2).

Table 3 shows the distribution and prevalence of factors associated with lifetime IPV perpetration, by violence category and by country. Table 4 shows multinomial models of factors associated with perpetration of the mutually exclusive outcomes by country: physical violence, sexual violence, both physical and sexual violence, and multiple emotional or economic violence, compared with no violence. Appendix pp 9–10 show a multinomial model for the combined dataset. An absence of high school education was associated with perpetration of physical violence alone in two of the six countries (Bangladesh and Papua New Guinea), with sexual violence alone in Indonesia, and with physical and sexual violence in Cambodia. Present food insecurity was associated with perpetration of sexual violence only and with both physical and sexual violence in Cambodia and Papua New Guinea (table 4). Childhood emotional abuse was associated with physical only violence in four of six countries (all except for Sri Lanka or Cambodia), sexual only violence in five of six countries (all countries except Bangladesh), and both physical and sexual violence in three countries (China, Indonesia, and Papua New Guinea; table 4). Childhood physical abuse was associated with physical only violence in three countries (Cambodia, Indonesia, and Sri Lanka) and with sexual partner violence (either on its own or with physical IPV) in Indonesia and Sri Lanka. Men who had experienced childhood sexual abuse were more likely to perpetrate physical only partner violence in Bangladesh and sexual only violence in Cambodia and Papua New Guinea. Childhood sexual abuse was associated with physical and sexual partner violence in three countries (Bangladesh, Cambodia, and Papua New Guinea), and with multiple emotional or economic abuse in two countries (Bangladesh and Sri Lanka). Men who had the least gender-equitable attitudes were more likely to use physical violence, either on its own or with sexual violence, in Bangladesh and Cambodia. Frequent quarrelling was associated with physical only violence and both physical and sexual partner violence in all six

	N	No violence	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
		Risk factor prevalence*	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)
Bangladesh										
Demographics										
Age 18–24 years (reference group)	108	7·7%	4·8%	..	15·6%	..	10·2%	..	6·8%	..
Age 25–34 years	513	36·2%	30·2%	1·34 (0·82–2·20)	32·8%	0·45 (0·20–1·01)	34·3%	0·71 (0·36–1·40)	28·4%	0·88 (0·34–2·27)
Age 35–49 years	940	56·1%	65·1%	1·87 (1·17–3·01)	51·6%	0·45 (0·21–0·98)	55·5%	0·74 (0·39–1·42)	64·8%	1·30 (0·53–3·19)
Ever married or cohabited	1561	96·0 %	99·7%	14·00 (3·30–59·51)	98·4%	2·63 (0·35–19·78)	100·0%	NA	97·7%	1·80 (0·42–7·73)
Social characteristics										
No high school	1561	39·2%	59·7%	2·24 (1·79–2·82)	51·6%	1·65 (0·98–2·78)	56·2%	1·99 (1·36–2·91)	38·6%	0·94 (0·59–1·49)
Present food insecurity	1547	34·0%	45·1%	1·58 (1·25–1·99)	34·9%	1·05 (0·61–1·8)	54·4%	2·35 (1·61–3·44)	28·4%	0·76 (0·46–1·24)
Victimisation history										
Childhood emotional abuse	1561	70·8%	88·1%	3·13 (2·33–4·20)	81·3%	1·86 (0·97–3·59)	86·1%	2·68 (1·60–4·50)	79·6%	1·62 (0·93–2·80)
Childhood physical abuse	1561	10·9%	18·1%	1·86 (1·34–2·58)	12·5%	1·11 (0·51–2·45)	29·9%	3·46 (2·20–5·44)	14·8%	1·44 (0·76–2·75)
Childhood sexual abuse	1561	18·7%	33·9%	2·50 (1·91–3·27)	26·6%	1·54 (0·84–2·82)	48·2%	4·32 (2·89–6·45)	42·1%	3·45 (2·14–5·57)
Witnessed abuse of mother	1561	18·7%	35·1%	2·45 (1·88–3·19)	23·4%	1·27 (0·68–2·35)	40·9%	2·99 (2·00–4·48)	33·0%	2·20 (1·35–3·61)
Sexual victimisation (including rape)	1546	2·0%	3·9%	2·25 (1·10–4·59)	4·8%	2·61 (0·71–9·65)	14·7%	9·28 (4·31–19·98)	3·4%	1·88 (0·52–6·86)
Psychological factors and substance misuse										
Empathy (continuous)	1561	..	..	0·99 (0·95–1·03)	..	0·98 (0·89–1·09)	..	0·99 (0·92–1·06)	..	1·29 (1·16–1·44)
Depression	1561	32·4%	47·0%	1·98 (1·57–2·50)	35·9%	1·20 (0·70–2·06)	57·7%	3·02 (2·06–4·43)	26·1%	0·76 (0·46–1·26)
Low life satisfaction (continuous)	1561	..	..	1·18 (1·11–1·25)	..	0·99 (0·87–1·14)	..	1·34 (1·21–1·49)	..	1·09 (0·96–1·23)
Alcohol misuse	1545	0·3%	0·2%	0·47 (0·04–5·26)	0·0%	NA	1·5%	3·60 (0·49–26·39)	1·1%	3·55 (0·31–40·11)
Gender attitudes and relationship practices										
Low gender equity	1560	13·7%	26·8%	2·30 (1·72–3·08)	14·1%	1·04 (0·49–2·18)	37·2%	3·73 (2·45–5·68)	14·8%	1·09 (0·58–2·06)
Controlling behaviour	1557	2·4%	6·4%	2·89 (1·56–5·38)	10·9%	5·00 (1·93–12·99)	13·9%	6·65 (3·22–13·72)	5·7%	2·54 (0·89–7·25)
Quarrelling	1552	14·5%	37·8%	3·60 (2·72–4·76)	17·2%	1·26 (0·63–2·51)	55·2%	7·37 (4·89–11·12)	21·8%	1·66 (0·95–2·90)
1 sexual partner (reference group)	1022	77·8%	62·5%	..	54·0%	..	38·1%	..	84·7%	..
2–3 sexual partners	357	16·5%	26·9%	2·08 (1·56–2·76)	31·8%	2·74 (1·51–4·99)	41·0%	5·11 (3·29–7·96)	10·6%	0·60 (0·29–1·24)
≥4 sexual partners	144	5·7%	10·6%	2·82 (1·79–4·45)	14·3%	3·91 (1·70–9·00)	20·9%	8·78 (4·82–15·99)	4·7%	0·82 (0·28–2·43)
Ever had sex with a sex worker or transactional sex	1524	13·5%	20·6%	1·93 (1·41–2·64)	39·7%	4·35 (2·45–7·71)	37·3%	4·18 (2·71–6·45)	10·6%	0·81 (0·39–1·71)
Participation in violence outside the home										
Involvement in gangs	1547	1·9%	2·4%	1·60 (0·71–3·62)	4·8%	2·72 (0·72–10·31)	11·0%	7·60 (3·26–17·74)	2·3%	1·36 (0·29–6·31)
Involved in fights with weapons	1546	2·7%	5·0%	2·06 (1·10–3·83)	3·2%	1·09 (0·24–4·91)	12·6%	5·24 (2·53–10·84)	5·7%	2·28 (0·81–6·43)
Cambodia										
Demographics										
Age 18–24 years (reference group)	167	15·2%	5·4%	..	17·0%	..	3·2%	..	8·0%	..

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	N	No violence	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
		Risk factor prevalence*	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)
(Continued from previous page)										
Age 25–34 years	591	44·1%	36·9%	2·38 (1·13–4·97)	42·6%	0·87 (0·56–1·35)	47·6%	5·17 (1·21–22·08)	41·5%	1·79 (1·11–2·88)
Age 35–49 years	632	40·7%	57·7%	4·02 (1·95–8·31)	40·4%	0·89 (0·57–1·39)	49·2%	5·79 (1·36–24·68)	50·5%	2·35 (1·47–3·77)
Ever married or cohabited	1390	90·7%	96·4%	2·77 (1·17–6·54)	93·9%	1·58 (0·86–2·90)	100·0%	NA	96·1%	2·55 (1·37–4·75)
Social characteristics										
No high school	1390	51·5%	58·9%	1·24 (0·87–1·76)	61·7%	1·50 (1·09–2·05)	82·5%	4·00 (2·04–7·84)	55·5%	1·09 (0·83–1·44)
Present food insecurity	1379	46·8%	58·3%	1·43 (1·00–2·03)	66·8%	2·38 (1·72–3·29)	82·0%	4·73 (2·40–9·31)	57·1%	1·41 (1·07–1·86)
Victimisation history										
Childhood emotional abuse	1390	64·2%	82·1%	2·74 (1·77–4·22)	81·3%	2·49 (1·71–3·62)	90·5%	5·87 (2·48–13·86)	81·9%	2·68 (1·93–3·72)
Childhood physical abuse	1390	34·5%	57·1%	2·88 (2·01–4·11)	47·0%	1·71 (1·25–2·33)	47·6%	1·93 (1·14–3·27)	51·3%	2·19 (1·66–2·90)
Childhood sexual abuse	1390	10·5%	17·3%	1·80 (1·11–2·92)	20·0%	2·15 (1·41–3·26)	30·2%	3·84 (2·10–7·03)	13·4%	1·34 (0·88–2·02)
Witnessed abuse of mother	1390	18·9%	32·7%	2·47 (1·67–3·67)	25·7%	1·48 (1·02–2·13)	38·1%	2·95 (1·68–5·18)	24·0%	1·49 (1·07–2·07)
Sexual victimisation (including rape)	1381	1·9%	6·6%	3·87 (1·62–9·23)	7·0%	4·02 (1·82–8·84)	12·9%	8·74 (3·30–23·15	2·7%	1·53 (0·62–3·78)
Psychological factors and substance misuse										
Empathy (continuous)	1390	..	..	1·08 (1·00–1·16)	..	1·01 (0·95–1·07)	..	1·05 (0·94–1·17)	..	1·05 (0·99–1·11)
Depression	1390	29·9%	57·1%	3·15 (2·21–4·50)	53·5%	2·69 (1·97–3·69)	81·0%	10·33 (5·36–19·90)	52·2%	2·59 (1·96–3·43)
Low life satisfaction (continuous)	1390	..	..	1·06 (0·98–1·14)	..	1·05 (0·98–1·12)	..	1·10 (0·99–1·23)	..	1·03 (0·97–1·09)
Alcohol misuse	1375	8·6%	15·6%	1·92 (1·15–3·21)	24·2%	3·44 (2·26–5·24)	32·3%	4·99 (2·71–9·19)	17·9%	2·30 (1·53–3·45)
Gender attitudes and relationship practices										
Low gender equity	1390	17·9%	32·1%	1·91 (1·29–2·83)	28·7%	1·86 (1·30–2·67)	41·3%	2·93 (1·69–5·09)	25·2%	1·42 (1·02–1·97)
Controlling behaviour	1382	2·6%	7·7%	3·21 (1·48–6·93)	8·3%	3·40 (1·70–6·83)	11·1%	4·77 (1·85–12·27)	3·9%	1·53 (0·72–3·27)
Quarrelling	1370	30·8%	70·7%	5·30 (3·63–7·75)	42·6%	1·65 (1·21–2·27)	65·1%	4·05 (2·34–7·01)	58·9%	3·17 (2·39–4·20)
1 sexual partner (reference group)	779	68·7%	50·3%	..	45·1%	..	39·7%	..	58·4%	..
2–3 sexual partners	335	19·2%	30·1%	2·16 (1·42–3·29)	34·2%	2·86 (1·97–4·14)	28·6%	2·61 (1·37–4·97)	26·1%	1·61 (1·15–2·25)
≥4 sexual partners	216	12·1%	19·6%	2·17 (1·33–3·54)	20·7%	2·81 (1·81–4·37)	31·8%	4·55 (2·38–8·69)	15·5%	1·49 (0·99–2·24
Ever had sex with a sex worker or transactional sex	1377	52·1%	56·0%	1·20 (0·85–1·71)	74·9%	2·66 (1·87–3·77)	77·8%	3·09 (1·66–5·76)	53·3%	1·03 (0·79–1·36)
Participation in violence outside the home										
Involvement in gangs	1383	5·1%	7·7%	1·69 (0·86–3·35)	10·9%	2·25 (1·29–3·92)	22·6%	5·70 (2·80–11·58)	5·7%	1·17 (0·64–2·11)
Involved in fights with weapons	1384	5·6%	7·7%	1·63 (0·83–3·22)	15·3%	3·26 (1·95–5·44)	30·7%	9·24 (4·76–17·91)	7·4%	1·54 (0·89–2·67)
China										
Demographics										
Age 18–24 years (reference group)	101	14·3%	5·7%	..	19·1%	..	6·0%	..	15·0%	..
Age 25–34 years	283	30·7%	29·8%	2·45 (1·34–4·48)	34·9%	0·86 (0·40–1·85)	27·4%	2·14 (0·89–5·13)	35·0%	1·09 (0·40–2·99)
Age 35–49 years	546	55·0%	64·6%	2·96 (1·67–5·25)	46·0%	0·63 (0·30–1·31)	66·7%	2·91 (1·28–6·64)	50·0%	0·87 (0·33–2·26)
Ever married or cohabited	930	91·2%	97·3%	3·49 (1·60–7·63)	90·5%	0·91 (0·37–2·26)	98·3%	5·52 (1·31–23·28)	95·0%	1·82 (0·42–7·87)

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	N	No violence	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
		Risk factor prevalence*	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)
(Continued from previous page)										
Social characteristics										
No high school	929	12·4%	14·7%	1·05 (0·67–1·65)	19·1%	2·10 (1·00–4·42)	13·8%	0·93 (0·50–1·74)	17·5%	1·71 (0·68–4·28)
Present food insecurity	927	19·0%	20·1%	0·98 (0·67–1·44)	23·8%	1·49 (0·78–2·86)	28·5%	1·55 (0·96–2·52)	23·1%	1·35 (0·61–3·02)
Victimisation history										
Childhood emotional abuse	929	52·8%	75·8%	2·84 (2·03–3·95)	77·8%	3·09 (1·65–5·77)	88·0%	6·67 (3·68–12·07)	82·5%	4·13 (1·78–9·56)
Childhood physical abuse	929	18·3%	28·5%	1·87 (1·30–2·68)	31·8%	2·05 (1·14–3·69)	42·7%	3·51 (2·24–5·50)	22·5%	1·30 (0·59–2·85)
Childhood sexual abuse	929	7·3%	14·1%	2·07 (1·26–3·42)	12·7%	1·88 (0·82–4·31)	22·2%	3·62 (2·03–6·46)	10·0%	1·44 (0·48–4·32)
Witnessed abuse of mother	929	13·4%	23·2%	1·97 (1·33–2·92)	23·8%	2·00 (1·04–3·81)	39·3%	4·23 (2·64–6·78)	20·0%	1·58 (0·69–3·62)
Sexual victimisation (including rape)	918	1·7%	3·1%	1·78 (0·65–4·87)	3·2%	1·90 (0·39–9·38)	4·4%	2·59 (0·80–8·42)	2·6%	1·49 (0·18–12·46)
Psychological factors and substance misuse										
Empathy (continuous)	922	..	..	1·00 (0·95–1·05)	..	1·04 (0·95–1·13)	..	0·99 (0·93–1·06)	..	1·00 (0·91–1·11)
Depression	921	16·5%	31·5%	2·33 (1·62–3·34)	37·1%	3·01 (1·69–5·38)	36·5%	2·91 (1·82–4·63)	48·7%	4·84 (2·45–9·57)
Low life satisfaction (continuous)	925	..	..	1·09 (1·02–1·17)	..	1·17 (1·03–1·31)	..	1·21 (1·10–1·32)	..	1·17 (1·01–1·35)
Alcohol misuse	916	1·7%	8·1%	5·08 (2·14–12·05)	7·9%	4·77 (1·45–15·68)	9·8%	6·20 (2·33–16·53)	10·0%	5·96 (1·65–21·50)
Gender attitudes and relationship practices										
Low gender equity	923	1·7%	3·4%	1·88 (0·69–5·08)	0·0%	NA	2·6%	1·39 (0·35–5·57)	0·0%	NA
Controlling behaviour	921	4·2%	5·1%	1·24 (0·60–2·57)	4·8%	1·23 (0·35–4·34)	9·5%	2·42 (1·08–5·41)	7·7%	2·06 (0·57–7·41)
Quarrelling	928	61·7%	87·3%	4·67 (3·13–6·97)	68·3%	1·27 (0·72–2·26)	84·6%	3·78 (2·19–6·53)	89·7%	5·53 (1·92–15·93)
1 sexual partner (reference group)	293	46·3%	27·0%	..	39·7%	..	21·8%	..	27·8%	..
2–3 sexual partners	327	38·1%	43·3%	2·06 (1·42–3·01)	32·8%	0·97 (0·50–1·85)	36·4%	2·18 (1·24–3·82)	47·2%	2·01 (0·89–4·55)
≥4 sexual partners	206	15·6%	29·6%	3·63 (2·31–5·71)	27·6%	1·90 (0·93–3·91)	41·8%	6·60 (3·64–11·98)	25·0%	2·48 (0·95–6·51)
Ever had sex with a sex worker or transactional sex	839	50·1%	53·3%	1·18 (0·85–1·63)	57·9%	1·29 (0·72–2·30)	64·0%	1·90 (1·21–2·99)	55·6%	1·12 (0·55–2·28)
Participation in violence outside the home										
Involvement in gangs	924	2·2%	6·4%	3·65 (1·59–8·41)	6·4%	2·80 (0·83–9·50)	9·7%	5·94 (2·32–15·16)	15·0%	8·19 (2·69–24·94)
Involved in fights with weapons	924	4·2%	10·1%	2·94 (1·56–5·54)	9·5%	2·22 (0·83–5·93)	17·5%	5·88 (2·89–11·95)	12·5%	3·13 (1·07–9·15)
Indonesia										
Demographics										
Age 18–24 years (reference group)	563	22·7%	26·9%	..	20·9%	..	28·1%	..	25·3%	..
Age 25–34 years	780	30·3%	32·4%	0·90 (0·62–1·30)	34·6%	1·24 (0·91–1·69)	39·2%	1·04 (0·74–1·47)	34·6%	1·02 (0·74–1·40)
Age 35–49 years	1028	47·1%	40·8%	0·73 (0·51–1·04)	44·6%	1·03(0·77–1·38)	32·7%	0·56 (0·40–0·79)	40·2%	0·76 (0·56–1·04)
Ever married or cohabited	2371	71·4%	72·7%	1·07 (0·78–1·46)	80·5%	1·66 (1·26–2·18)	80·0%	1·61 (1·15–2·24)	70·2%	0·95 (0·73–1·23)
Social characteristics										
No high school	2371	21·3%	14·3%	0·64 (0·43–0·96)	13·0%	0·53 (0·38–0·73)	11·2%	0·51 (0·33–0·78)	19·7%	0·98 (0·72–1·33)
Present food insecurity	2365	8·5%	19·0%	2·51 (1·70–3·71)	13·8%	1·75 (1·23–2·48)	20·9%	2·82 (1·94–4·10)	13·8%	1·72 (1·18–2·48)

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	N	No violence	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
		Risk factor prevalence*	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)
(Continued from previous page)										
Victimisation history										
Childhood emotional abuse	2371	49·3%	74·0%	2·99 (2·18–4·11)	68·7%	2·43 (1·91–3·09)	85·0%	6·19 (4·29–8·94)	72·5%	2·74 (2·10–3·57)
Childhood physical abuse	2371	22·5%	48·7%	3·36 (2·50–4·52)	37·6%	2·23 (1·75–2·86)	65·4%	6·94 (5·14–9·38)	36·0%	1·93 (1·48–2·51)
Childhood sexual abuse	2371	4·1%	10·5%	2·74 (1·63–4·58)	10·9%	3·06 (1·99–4·70)	20·4%	6·33 (4·10–9·80)	8·2%	2·05 (1·26–3·33)
Witnessed abuse of mother	2371	5·8%	29·0%	6·71 (4·58–9·82)	16·5%	3·37 (2·34–4·84)	35·8%	9·34 (6·47–13·49)	12·9%	2·39 (1·60–3·58)
Sexual victimisation (including rape)	2357	3·0%	2·6%	0·85 (0·35–2·07)	5·6%	2·13 (1·23–3·70)	10·5%	3·99 (2·30–6·91)	5·6%	1·92 (1·08–3·42)
Psychological factors and substance misuse										
Empathy (continuous)	2356	..	..	0·97 (0·92–1·01)	..	0·95 (0·92–0·98)	..	0·93 (0·89–0·97)	..	0·96 (0·93–1·00)
Depression	2369	12·1%	26·5%	2·61 (1·85–3·69)	23·7%	2·37 (1·77–3·18)	33·5%	3·67 (2·65–5·07)	23·6%	2·21 (1·63–3·01)
Low life satisfaction (continuous)	2366	..	..	1·06 (0·98–1·15)	..	1·07 (1·00–1·14)	..	1·09 (1·01–1·18)	..	1·10 (1·03–1·18)
Alcohol misuse	2357	5·2%	21·9%	5·26 (3·46–8·00)	17·5%	4·32 (2·97–6·30)	35·8%	10·85 (7·36–15·99)	11·3%	2·26 (1·47–3·48)
Gender attitudes and relationship practices										
Low gender equity	2361	6·4%	11·4%	1·89 (1·18–3·03)	13·1%	2·27 (1·56–3·30)	22·8%	4·42 (3·00–6·51)	7·0%	1·11 (0·69–1·78)
Controlling behaviour	2263	3·2%	6·1%	1·97 (1·04–3·75)	10·3%	3·49 (2·18–5·59)	11·5%	4·00 (2·36–6·79)	3·9%	1·22 (0·63–2·35
Quarrelling	2333	22·9%	54·9%	4·06 (3·02–5·45)	39·1%	2·19 (1·72–2·80)	57·8%	4·57 (3·41–6·11)	40·7%	2·28 (1·76–2·95)
1 sexual partner (reference group)	1306	83·3%	50·5%	..	56·1%	..	35·3%	..	74·5%	..
2–3 sexual partners	442	13·1%	35·4%	4·25 (2·93–6·15)	28·7%	3·19 (2·34–4·36)	39·6%	7·21 (4·98–10·42)	19·2%	1·51 (1·04–2·18)
≥4 sexual partners	195	3·5%	14·1%	6·01 (3·41–10·61)	15·2%	6·17 (3·82–9·96)	25·1%	16·34 (9·75–27·37)	6·3%	1·75 (0·94–3·25)
Ever had sex with a sex worker or transactional sex	2251	38·6%	53·5%	1·82 (1·35–2·45)	66·7%	2·83 (2·20–3·63)	71·1%	3·43 (2·50–4·71)	50·2%	1·63 (1·27–2·11)
Participation in violence outside the home										
Involvement in gangs	2367	4·9%	10·9%	2·38 (1·44–3·92)	16·3%	4·31 (2·92–6·35)	25·6%	7·19 (4·77–10·84)	12·1%	2·66 (1·73–4·09)
Involved in fights with weapons	2364	9·1%	21·4%	2·72 (1·86–3·96)	18·8%	2·47 (1·79–3·42)	32·3%	4·87 (3·45–6·87)	18·9%	2·29 (1·63–3·22)
Papua New Guinea										
Demographics										
Age 18–24 years (reference group)	137	35·2%	10·9%	..	23·9%	..	16·3%	..	19·2%	..
Age 25–34 years	255	29·7%	39·5%	4·30 (2·02–9·13)	35·4%	1·76 (0·89–3·49)	36·1%	2·62 (1·41–4·84)	34·6%	2·13 (0·84–5·39)
Age 35–49 years	322	35·2%	49·7%	4·56 (2·20–9·47)	40·8%	1·71 (0·88–3·31)	47·6%	2·92 (1·62–5·26)	46·2%	2·40 (0·99–5·82)
Ever married or cohabited	714	72·5%	95·2%	7·58 (3·12–18·41)	88·5%	2·90 (1·43–5·90)	94·9%	7·05 (3·52–14·10)	92·3%	4·55 (1·48–13·92)
Social characteristics										
No high school	713	45·1%	61·2%	1·86 (1·08–3·22)	57·7%	1·63 (0·95–2·83)	52·6%	1·30 (0·80–2·13)	48·1%	1·09 (0·55–2·18)
Present food insecurity	706	26·4%	40·0%	2·00 (1·10–3·62)	49·6%	2·93 (1·62–5·31)	52·6%	3·34 (1·94–5·75)	28·0%	1·16 (0·53–2·54)
Victimisation history										
Childhood emotional abuse	714	61·5%	84·4%	3·66 (1·92–6·96)	90·0%	6·01 (2·91–12·42)	93·9%	10·36 (5·34–20·09)	80·8%	2·79 (1·22–6·38)

(Continues on next page)

	N	No violence	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
		Risk factor prevalence*	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)
(Continued from previous page)										
Childhood physical abuse	714	55·0%	64·6%	1·44 (0·83–2·51)	65·4%	1·48 (0·85–2·58)	78·6%	2·87 (1·71–4·80)	53·9%	0·91 (0·45–1·83)
Childhood sexual abuse	714	7·7%	29·9%	7·36 (2·98–18·17)	34·6%	8·52 (3·48–20·83)	41·5%	12·23 (5·16–28·98)	21·2%	4·44 (1·54–12·81)
Witnessed abuse of mother	714	35·2%	53·7%	2·25 (1·29–3·93)	53·1%	2·13 (1·22–3·73)	66·3%	3·78 (2·26–6·30)	57·7%	2·60 (1·28–5·28)
Sexual victimisation (including rape)	710	5·5%	5·4%	1·00 (0·31–3·26)	7·0%	1·28 (0·41–4·00)	8·2%	1·53 (0·55–4·27)	5·9%	1·07 (0·24–4·73)
Psychological factors and substance misuse										
Empathy (continuous)	713	..	..	0·90 (0·82–0·99)	..	0·89 (0·81–0·98)	..	0·85 (0·78–0·93)	..	0·86 (0·77–0·96)
Depression	714	27·5%	38·1%	1·54 (0·86–2·77)	47·7%	2·32 (1·30–4·16)	51·0%	2·61 (1·54–4·42)	25·0%	0·84 (0·38–1·84)
Low life satisfaction (continuous)	713	..	..	0·99 (0·88–1·11)	..	1·01 (0·89–1·14)	..	1·16 (1·04–1·29)	..	1·04 (0·89–1·21)
Alcohol misuse	708	28·6%	25·3%	0·88 (0·48–1·62)	31·0%	1·12 (0·62–2·04)	49·3%	2·51 (1·48–4·27)	26·0%	0·88 (0·40–1·95)
Gender attitudes and relationship practices										
Low gender equity	713	17·6%	27·9%	1·76 (0·91–3·44)	24·6%	1·49 (0·75–2·93)	19·8%	1·12 (0·60–2·10)	25·0%	1·52 (0·66–3·51)
Controlling behaviour	710	12·2%	19·9%	1·92 (0·89–4·17)	14·7%	1·30 (0·58–2·92)	22·9%	2·31 (1·13–4·70)	17·3%	1·61 (0·61–4·25)
Quarrelling	703	21·8%	34·0%	1·57 (0·84–2·94)	30·1%	1·39 (0·73–2·67)	34·4%	1·62 (0·91–2·88)	30·8%	1·40 (0·63–3·08)
1 sexual partner (reference group)	267	51·9%	53·2%	..	36·0%	..	25·8%	..	58·0%	..
2–3 sexual partners	213	29·6%	25·2%	1·03 (0·53–2·00)	38·4%	2·07 (1·07–4·01)	33·0%	2·65 (1·44–4·87)	18·0%	0·61 (0·24–1·53)
≥4 sexual partners	210	18·5%	21·7%	1·26 (0·60–2·64)	25·6%	2·12 (1·00–4·50)	41·2%	4·92 (2·51–9·64)	24·0%	1·27 (0·51–3·14)
Ever had sex with a sex worker or transactional sex	705	19·8%	30·3%	1·59 (0·84–3·03)	51·6%	4·06 (2·16–7·63)	52·8%	4·17 (2·33–7·46)	27·5%	1·42 (0·63–3·21)
Participation in violence outside the home										
Involvement in gangs	711	15·4%	16·3%	1·04 (0·50–2·18)	37·2%	3·26 (1·65–6·44)	34·8%	2·92 (1·54–5·52)	7·8%	0·46 (0·14–1·51)
Involved in fights with weapons	712	19·8%	19·1%	0·94 (0·48–1·86)	31·5%	1·91 (1·00–3·65)	42·0%	2·99 (1·67–5·38)	17·7%	0·88 (0·36–2·17)
Sri Lanka										
Demographics										
Age 18–24 years (reference group)	202	24·3%	10·6%	..	16·2%	..	4·3%	..	16·9%	..
Age 25–34 years	394	36·2%	41·2%	2·61 (1·50–4·55)	41·4%	1·72 (0·93–3·17)	41·4%	6·49 (1·94–21·67)	36·6%	1·45 (0·71–2·97)
Age 35–49 years	444	39·5%	48·2%	2·80 (1·62–4·84)	42·4%	1·61 (0·88–2·97)	54·3%	7·78 (2·36–25·65)	46·5%	1·69 (0·85–3·37)
Ever married or cohabited	1040	68·9%	90·0%	4·06 (2·40–6·90)	77·8%	1·58 (0·96–2·61)	95·7%	10·09 (3·13–32·46)	77·5%	1·55 (0·87–2·78)
Social characteristics										
No high school	1039	10·8%	12·4%	0·94 (0·55–1·60)	5·1%	0·39 (0·15–1·01)	8·6%	0·59 (0·24–1·42)	12·7%	1·08 (0·51–2·30)
Present food insecurity	999	14·5%	23·9%	1·89 (1·22–2·94)	19·2%	1·43 (0·82–2·49)	24·2%	2·00 (1·07–3·76)	23·2%	1·88 (1·02–3·47)
Victimisation history										
Childhood emotional abuse	1040	42·2%	66·5%	3·05 (2·12–4·40)	64·7%	2·67 (1·71–4·17)	78·6%	5·93 (3·25–10·82)	70·4%	3·51 (2·05–6·02)
Childhood physical abuse	1040	31·3%	59·4%	3·24 (2·27–4·63)	47·5%	1·99 (1·30–3·06)	72·9%	6·00 (3·43–10·51)	43·7%	1·72 (1·04–2·83)
Childhood sexual abuse	1040	11·9%	18·2%	1·84 (1·15–2·94)	24·2%	2·49 (1·47–4·20)	21·4%	2·35 (1·25–4·45)	26·8%	2·87 (1·60–5·14)

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	N	No violence	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
		Risk factor prevalence*	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)	Risk factor prevalence*	Crude RRR† (95% CI)
(Continued from previous page)										
Witnessed abuse of mother	1034	24·0%	49·4%	3·18 (2·22–4·56)	32·3%	1·54 (0·97–2·44)	55·7%	4·18 (2·50–7·00)	35·2%	1·75 (1·04–2·95)
Sexual victimisation (including rape)	1013	2·9%	3·7%	1·58 (0·60–4·17)	5·1%	1·95 (0·70–5·44)	10·3%	5·17 (1·97–13·60)	7·1%	2·84 (1·01–7·99)
Psychological factors and substance misuse										
Empathy (continuous)	978	..	..	0·92 (0·88–0·96)	..	0·93 (0·88–0·98)	..	0·88 (0·83–0·94)	..	0·97 (0·91–1·03)
Depression	1003	11·6%	23·9%	2·84 (1·79–4·50)	11·1%	1·03 (0·52–2·04)	20·6%	2·52 (1·30–4·89)	24·6%	2·78 (1·50–5·14)
Low life satisfaction (continuous)	1001	..	..	1·05 (0·99–1·11)	..	1·13 (1·05–1·21)	..	1·26 (1·15–1·38)	..	1·04 (0·95–1·13)
Alcohol misuse	1003	6·1%	13·8%	2·36 (1·33–4·17)	16·2%	2·89 (1·53–5·44)	32·4%	7·09 (3·80–13·22)	17·4%	3·23 (1·59–6·57)
Gender attitudes and relationship practices										
Low gender equity	1022	12·6%	19·9%	1·64 (1·04–2·60)	8·3%	0·61 (0·28–1·31)	15·9%	1·25 (0·62–2·51)	22·5%	2·03 (1·10–3·74)
Controlling behaviour	999	10·7%	20·5%	2·10 (1·31–3·37)	15·2%	1·49 (0·79–2·80)	12·9%	1·23 (0·58–2·65)	25·7%	3·00 (1·64–5·49)
Quarrelling	1028	21·5%	66·9%	6·74 (4·61–9·85)	42·9%	2·70 (1·72–4·23)	68·6%	7·06 (4·08–12·21)	59·2%	5·33 (3·17–8·95)
1 sexual partner (reference group)	941	75·8%	70·1%	..	38·4%	..	24·6%	..	62·5%	..
2–3 sexual partners	1020	17·0%	23·4%	1·60 (0·99–2·59)	44·2%	5·00 (2·92–8·58)	41·5%	8·39 (4·27–16·48)	19·6%	1·44 (0·69–2·99)
≥4 sexual partners	1020	7·2%	6·6%	1·22 (0·55–2·70)	17·4%	4·59 (2·18–9·65)	33·9%	19·16 (8·88–41·33)	17·9%	3·22 (1·41–7·36)
Ever had sex with a sex worker or transactional sex	496	10·8%	20·6%	1·97 (1·21–3·23)	34·5%	4·08 (2·41–6·89)	53·0%	8·50 (4·80–15·03)	21·2%	2·15 (1·12–4·15)
Participation in violence outside the home										
Involvement in gangs	179	6·2%	10·3%	2·06 (1·11–3·85)	8·2%	1·47 (0·66–3·27)	34·8%	10·82 (5·71–20·49)	8·6%	1·55 (0·63–3·84)
Involved in fights with weapons	86	7·0%	16·9%	3·46 (2·01–5·95)	11·2%	1·90 (0·93–3·88)	40·6%	13·41 (7·22–24·89)	20·0%	3·85 (1·95–7·60)

RRR=relative risk ratio. NA=not applicable. *The risk factor prevalence is the percentage of the sample that has a particular demographic, characteristic, or risk factor by each of the violence types. This prevalence is not possible for the continuous variables empathy and life satisfaction. †The crude RRR is the ratio of the prevalence of intimate partner violence with the risk factor compared with the prevalence of intimate partner violence without the risk factor. The associated CI indicates whether this ratio is statistically significant at the bivariate level. Note that this ratio is an unadjusted crude rate for the demographic variables "age" and "ever married or cohabited", but for other variables the crude rate is adjusted for age and marital status. For multicategory variables (eg, age group or number of sexual partners), the first category is the reference category. In those cases, the crude RRR is the ratio of intimate partner violence prevalence in each of the categories compared with the reference category.

Table 3: **Distribution and prevalence of possible factors associated with lifetime intimate partner violence perpetration, by intimate partner violence category, by country**

countries, but was only associated with sexual violence alone in Cambodia and Sri Lanka. Controlling behaviour was associated with physical violence or with both physical and sexual violence in three of six countries (Bangladesh, China, and Sri Lanka), and with sexual only partner violence in three countries (Bangladesh, Cambodia, and Indonesia). To have a higher number of sexual partners was associated with physical only or sexual only partner violence in all countries except Papua New Guinea, and with both physical and sexual violence in all countries. Transactional sex was associated with sexual only violence in Bangladesh, Cambodia, and Indonesia and with physical only violence in Bangladesh. Depression was associated with all types of IPV (except for emotional/economic) in three of six countries (Bangladesh, Cambodia, and China). Alcohol misuse was associated with physical partner violence in China and with sexual partner violence in Cambodia. Men who had been involved in gangs were more likely to use physical violence alone in China, sexual violence alone in Indonesia, and both physical and sexual violence in Bangladesh and Indonesia. Fights with weapons were associated with sexual violence in Cambodia and with both physical and sexual violence in Cambodia, Papua New Guinea, and Sri Lanka.

Appendix p 11 lists PAFs for factors associated with IPV perpetration by country. Table 5 shows associated factors, ordered by the highest PAF values, and suggests possible preventive interventions. Addressing of factors related to gender attitudes and relationship practices are especially important across countries (although less so in Papua New Guinea), with frequent quarrelling, more sexual

	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
	Adjusted RRR† (95% CI)	PAF‡	Adjusted RRR (95% CI)	PAF	Adjusted RRR (95% CI)	PAF	Adjusted RRR (95% CI)	PAF
Bangladesh								
Social characteristics								
No high school	1·88 (1·38–2·56)	0·28	..	..	..	..	..	..
Present food insecurity	..	..	..	..	..	..	..	..
Victimisation history								
Childhood emotional abuse	1·86 (1·31–2·66)	0·41	..	..	..	..	..	..
Childhood physical abuse	..	..	..	..	..	..	..	..
Childhood sexual abuse	1·53 (1·10–2·13)	0·12	..	..	2·31 (1·39–3·84)	0·27	2·72 (1·65–4·47)	0·27
Witnessed abuse of mother	..	..	..	..	..	..	..	..
Sexual victimisation (including rape)	..	..	..	..	4·26 (1·29–14·12)	0·11	..	..
Gender attitudes and relationship practices								
Low gender equity	1·82 (1·35–2·44)	0·12	..	..	2·22 (1·28–3·84)	0·20	..	..
Controlling behaviour	2·27 (1·10–4·67)	0·04	5·47 (2·10–14·20)	0·09	4·10 (1·72–9·73)	0·10	..	..
Quarrelling	2·74 (1·99–3·78)	0·24	..	..	4·95 (2·94–8·33)	0·44	..	..
1 sexual partner	..	..	..	..	..	..	..	..
2–3 sexual partners	1·60 (1·14–2·24)	0·10	..	..	3·18 (1·75–5·78)	0·28	..	..
≥4 sexual partners	..	..	..	..	3·07 (1·38–6·85)	0·14	..	
Ever had sex with a sex worker or transactional sex	1·49 (1·03–2·13)	0·07	3·05 (1·62–5·75)	0·27	..	..	..	..
Psychological factors and substance misuse								
Empathy	..	..	..	..	..	..	1·27 (1·12–1·45)	NA
Depression	1·40 (1·04–1·88)	0·13	..	..	1·71 (1·06–2·76)	0·24	..	..
Low life satisfaction	1·13 (1·05–1·21)	NA	..	..	1·25 (1·10–1·42)	NA	..	..
Alcohol misuse	..	..	..	..			..	..
Participation in violence outside the home								
Involvement in gangs	..	..	..	..	6·71 (1·94–23·14)	0·09	..	..
Involved in fights with weapons	..	..	..	..	..	..	..	..
Cambodia								
Social characteristics								
No high school	..	..	..	..	4·02 (1·82–8·90)	0·62	..	..
Present food insecurity	..	..	2·27 (1·44–3·57)	0·37	2·95 (1·41–6·15)	0·54	..	..
Victimisation history								
Childhood emotional abuse	..	..	1·55 (1·02–2·37)	0·29	..	..	1·74 (1·21–2·50)	0·35
Childhood physical abuse	2·16 (1·42–3·28)	0·31	..	..	..	..	1·77 (1·29–2·43)	0·22
Childhood sexual abuse	..	..	1·83 (1·14–2·96)	0·09	2·41 (1·23–4·73)	0·18	..	..
Witnessed abuse of mother	1·82 (1·28–2·59)	0·15	..	..	..	..	..	..
Sexual victimisation (including rape)	..	..	..	..	..	..	..	..
Gender attitudes and relationship practices								
Low gender equity	..	..	..	..	2·31 (1·25–4·28)	0·23	..	..
Controlling behaviour	..	..	2·55 (1·30–4·98)	0·05	..	..	..	..
Quarrelling	4·57 (3·01–6·93)	0·55	1·56 (1·09–2·23)	0·15	3·08 (1·71–5·54)	0·44	2·66 (1·98–3·59)	0·37
1 sexual partner	..	..	..	..	..	..	..	..
2–3 sexual partners	2·29 (1·36–3·84)	0·17	2·37 (1·59–3·52)	0·20	..	..	1·63 (1·12–2·37)	0·10
≥4 sexual partners	2·08 (1·10–3·94)	..	2·07 (1·27–3·37)	0·11	2·53 (1·16–5·52)	0·19	..	..
Ever had sex with a sex worker or transactional sex	..	..	1·75 (1·18–2·61)	0·32	..	..	..	..
Psychological factors and substance misuse								
Empathy	..	..	..	..	..	..	..	..
Depression	2·38 (1·55–3·66)	0·33	1·78 (1·26–2·50)	0·23	5·08 (2·41–10·70)	0·65	1·97 (1·41–2·74)	0·26

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	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
	Adjusted RRR† (95% CI)	PAF‡	Adjusted RRR (95% CI)	PAF	Adjusted RRR (95% CI)	PAF	Adjusted RRR (95% CI)	PAF
(Continued from previous page)								
Low life satisfaction	..	..	..	..	..	..	..	..
Alcohol misuse	..	..	2·59 (1·61–4·15)	0·15	3·24 (1·65–6·36)	0·22	1·78 (1·16–2·72)	0·08
Participation in violence outside the home								
Involvement in gangs	..	..	..	..	..	..	..	..
Involved in fights with weapons	..	..	2·04 (1·03–4·06)	0·08	6·34 (2·37–16·92)	0·26	..	..
China								
Social characteristics								
No high school	..	..	..	..	..	..	..	..
Present food insecurity	..	..	..	..	..	..	..	..
Victimisation history								
Childhood emotional abuse	1·73 (1·10–2·71)	0·32	2·89 (1·20–6·95)	0·51	3·36 (1·99–5·67)	0·62	3·15 (1·01–9·81)	0·56
Childhood physical abuse	..	..	..	..	..	..	..	..
Childhood sexual abuse	..	..	..	..	..	..	..	..
Witnessed abuse of mother	..	..	..	..	2·56 (1·68–3·91)	0·24	..	..
Sexual victimisation (including rape)	..	..	..	..	..	..	..	..
Gender attitudes and relationship practices								
Low gender equity	..	..	..	..	..	..	..	..
Controlling behaviour	..	..	..	..	3·40 (1·39–8·30)	0·07	..	..
Quarrelling	3·89 (2·45–6·17)	0·65	..	..	3·24 (1·92–5·47)	0·59	8·45 (1·70–42·10)	0·79
1 sexual partner	..	..	..	..	..	..	..	..
2–3 sexual partners	1·84 (1·29–2·63)	0·20	..	..	..	..	..	..
≥4 sexual partners	2·67 (1·80–3·95)	0·19	..	..	4·49 (2·11–9·55)	0·33	..	..
Ever had sex with a sex worker or transactional sex	..	..	..	..	..	..	..	..
Psychological factors and substance misuse								
Empathy	..	..	..	..	..	..	..	..
Depression	1·66 (1·11–2·46)	0·12	2·28 (1·01–5·15)	0·21	..	..	3·89 (1·81–8·36)	0·36
Low life satisfaction	..	..	..	..	..	..	..	..
Alcohol misuse	3·04 (1·17–7·88)	0·05	..	..	..	..	..	..
Participation in violence outside the home								
Involvement in gangs	2·57 (1·09–6·07)	0·04	..	..	..	..	7·18 (1·90–27·11)	0·13
Involved in fights with weapons	..	..	..	..	..	..	..	..
Indonesia								
Social characteristics								
No high school	..	..	0·62 (0·43–0·89)	–0·08	..	..	..	..
Present food insecurity	..	..	..	..	..	..	..	..
Victimisation history								
Childhood emotional abuse	1·50 (1·22–1·84)	0·25	1·44 (1·20–1·73)	0·21	1·97 (1·64–2·38)	0·42	1·62 (1·30–2·02)	0·28
Childhood physical abuse	1·90 (1·26–2·85)	0·23	1·51 (1·07–2·13)	0·13	2·81 (1·96–4·05)	0·42	1·58 (1·05–2·36)	0·13
Childhood sexual abuse	..	..	..	..	..	..	..	..
Witnessed abuse of mother	3·50 (2·08–5·87)	0·21	1·94 (1·35–2·78)	0·08	3·35 (2·12–5·29)	0·25	..	..
Sexual victimisation (including rape)	..	..	2·45 (1·02–5·88)	0·03	2·75 (1·14–6·68)	0·07	..	..
Gender attitudes and relationship practices								
Low gender equity	..	..	..	..	..	..	..	..
Controlling behaviour	..	..	2·50 (1·14–5·49)	0·06	..	..	..	..
Quarrelling	2·55 (1·75–3·72)	0·33	..	..	2·13 (1·53–2·97)	0·31	1·68 (1·23–2·30)	0·17
1 sexual partner	..	..	..	..	..	..	..	..

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	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
	Adjusted RRR† (95% CI)	PAF‡	Adjusted RRR (95% CI)	PAF	Adjusted RRR (95% CI)	PAF	Adjusted RRR (95% CI)	PAF
(Continued from previous page)								
2–3 sexual partners	2·16 (1·47–3·15)	0·19	2·06 (1·41–3·00)	0·15	2·74 (1·71–4·38)	0·25	..	..
≥4 sexual partners	2·85 (1·49–5·45)	0·09	3·42 (1·65–7·09)	0·11	4·78 (2·47–9·26)	0·20	..	..
Ever had sex with a sex worker or transactional sex	..	..	1·58 (1·18–2·12)	0·24	1·85 (1·19–2·89)	0·33	..	..
Psychological factors and substance misuse								
Empathy	..	..	..	..	..	..	0·94 (0·91–0·98)	NA
Depression	..	..	1·58 (1·09–2·29)	0·09	1·65 (1·01–2·69)	0·13	1·64 (1·16–2·33)	0·09
Low life satisfaction	..	..	1·11 (1·02–1·21)	NA	1·12 (1·01–1·25)	NA	..	..
Alcohol misuse	..	..	..	..	..	..	..	..
Participation in violence outside the home								
Involvement in gangs	..	..	2·02 (1·23–3·32)	0·08	2·10 (1·07–4·12)	0·13	..	..
Involved in fights with weapons	..	..	..	..	..	..	..	..
Papua New Guinea								
Social characteristics								
No high school	2·12 (1·19–3·77)	0·32	..	..	..	..	..	..
Present food insecurity	..	..	2·69 (1·08–6·67)	0·31	3·39 (1·54–7·44)	0·37	..	..
Victimisation history								
Childhood emotional abuse	1·95 (1·01–3·80)	0·41	3·58 (1·41–9·08)	0·65	4·45 (1·93–10·28)	0·73	..	..
Childhood physical abuse	..	..	..	..	..	..	..	..
Childhood sexual abuse	5·24 (1·80–15·27)	0·24	4·66 (1·92–11·28)	0·27	6·25 (2·43–16·10)	0·35	..	..
Witnessed abuse of mother	..	..	..	..	..	..	..	..
Sexual victimisation (including rape)	..	..	..	..	..	..	..	..
Gender attitudes and relationship practices								
Low gender equity	..	..	..	..	..	..	..	..
Controlling behaviour	..	..	..	..	..	..	..	..
Quarrelling	1·91 (1·05–3·46)	0·16	..	..	1·88 (1·04–3·41)	0·16	..	..
1 sexual partner	..	..	..	..	..	..	..	..
2–3 sexual partners	..	..	2·34 (1·15–4·75)	0·22	2·46 (1·13–5·36)	0·20	..	..
≥4 sexual partners	..	..	..	..	3·69 (1·39–9·77)	0·30	..	..
Ever had sex with a sex worker or transactional sex	..	..	..	..	..	..	..	..
Psychological factors and substance misuse								
Empathy	..	..	0·93 (0·87–1·00)	NA	0·88 (0·82–0·95)	NA	0·90 (0·82–0·98)	NA
Depression	..	..	..	..	..	..	..	..
Low life satisfaction	..	..	..	..	..	..	..	..
Alcohol misuse	..	..	..	..	..	..	..	..
Participation in violence outside the home								
Involvement in gangs	..	..	..	..	..	..	..	..
Involved in fights with weapons	..	..	..	..	2·35 (1·17–4·74)	0·24	..	..
Sri Lanka								
Social characteristics								
No high school	..	..	..	..	..	..	..	..
Present food insecurity	..	..	..	..	..	..	..	..
Victimisation history								
Childhood emotional abuse	..	..	2·22 (1·34–3·68)	0·36	..	..	2·94 (1·50–5·76)	0·46
Childhood physical abuse	2·39 (1·55–3·68)	0·35	..	..	2·72 (1·21–6·14)	0·46	..	..
Childhood sexual abuse	..	..	..	..	..	..	2·88 (1·15–7·21)	0·17
Witnessed abuse of mother	2·33 (1·41–3·83)	0·28	..	..	..	..	..	..

(Continues on next page)

	Physical violence only		Sexual violence only		Physical and sexual violence		Emotional/economic violence	
	Adjusted RRR† (95% CI)	PAF‡	Adjusted RRR (95% CI)	PAF	Adjusted RRR (95% CI)	PAF	Adjusted RRR (95% CI)	PAF
(Continued from previous page)								
Sexual victimisation (including rape)	..	..	..	..	..	..	..	..
Gender attitudes and relationship practices								
Low gender equity	..	..	..	..	..	..	..	..
Controlling behaviour	3·30 (1·61–6·75)	0·14	..	..	..	..	5·13 (1·79–14·66)	0·21
Quarrelling	8·67 (5·51–13·64)	0·59	3·47 (1·67–7·18)	0·30	8·75 (4·80–15·95)	0·61	5·90 (3·32–10·47)	0·49
1 sexual partner	..	..	..	..	..	..	..	..
2–3 sexual partners	..	..	5·43 (3·22–9·14)	0·36	6·00 (2·42–14·88)	0·35	..	..
≥4 sexual partners	..	..	3·70 (1·60–8·58)	0·13	7·60 (2·82–20·54)	0·29	..	..
Ever had sex with a sex worker or transactional sex	..	..	..	..	..	..	..	..
Psychological factors and substance misuse								
Empathy	0·91 (0·85–0·96)	NA	0·92 (0·85–1·00)	NA	0·86 (0·80–0·93)	NA	..	..
Depression	..	..	..	..	..	..	..	..
Low life satisfaction	..	..	..	..	1·17 (1·05–1·30)	NA	..	..
Alcohol misuse	..	..	..	..	..	..	..	..
Participation in violence outside the home								
Involvement in gangs	..	..	..	..	..	..	..	..
Involved in fights with weapons	..	..	..	..	4·85 (1·98–11·87)	0·32	..	..

RRR=relative risk ratio. PAF=population-attributable fraction. NA=not applicable (PAFs were not calculated for these variables because they were continuous). We modelled each country separately with use of backwards elimination for non-significant variables. ".." denotes the variables that were eliminated from the country models in the process of backwards elimination, and factors that were non-significant for some outcomes. *Adjusted by age, site, and partnership status and all other factors shown. †The adjusted RRR is the RRR from the fully adjusted parsimonious model generated for each country. RRRs explain the relative effect of different explanatory variables on the outcomes—they are similar to odds ratios, but instead of using as a base condition "all others besides those with the outcome", there is one base case (no violence) against which the multiple outcomes are compared one by one. If a risk factor does not have an adjusted RRR, it means that this factor ceases to become statistically significant when adjusted for all other factors in the parsimonious model and therefore it was removed from the modelling process. ‡ We calculated PAFs to assess the combined strength of the association expressed by the RRR and the prevalence of that explanatory variable. The PAFs for different types of partner violence perpetration were calculated with the RRR from the adjusted model and the formula PAF= ((RRR–1)/RRR) x Pe , in which Pe was the proportion of the cases that had the exposure. PAFs cannot be presented for continuous variables, empathy, or life satisfaction. Although presented at the country level, the PAFs only represent the sampled sites, not the entire country, and could be hiding subnational differences.

Table 4: **Fully adjusted multinomial regression models of factors associated with different types of lifetime intimate partner violence perpetration, by country***

partners, and engagement in transactional sex all having a substantial effect on men's reported perpetration of IPV. Men's own experiences of violence, especially emotional abuse during childhood and witnessing of their mother being beaten, also have a large bearing on IPV perpetration. Psychological factors and substance abuse have the next largest PAF values, but are not significant in Papua New Guinea or Sri Lanka. Low education and food insecurity are less important overall than are other factors, although are still relevant in the lowest-income settings: Bangladesh, Cambodia, and Papua New Guinea. Participation in violence outside the home is most relevant for sexual only violence or both physical and sexual partner violence in Cambodia, Indonesia, Papua New Guinea, and Sri Lanka.

Discussion

The study shows that IPV perpetration is fairly common in the Asia-Pacific region, although the prevalence varies widely by site. The data are consistent and concur with what women have been reporting in surveys about violence against women.[3]

IPV perpetration rates were lowest in Sri Lanka and the urban and rural sites in Indonesia, and highest in Bougainville, Papua New Guinea. The high rates of violence perpetration in the Pacific region (Bougainville, Papua New Guinea, and Jayapura, Indonesia) are supported by other population-based studies, in which between 40% (in Tonga) and 68% (in Kiribati) of ever-partnered women report experiencing physical or sexual partner violence, or both.[4–6] Moreover, Bougainville and Jayapura are both post-conflict settings, which might contribute to the high prevalence of IPV, although this link is unclear since violence against women is also highly prevalent in areas of Papua New Guinea that are unaffected by conflict.[25,26] Indonesia and Sri Lanka rank higher on the UN gender development index than other countries in the study,[27] which could help to explain the

	Range of country-level PAF values*	Possible IPV prevention interventions
Gender attitudes and relationship practices		
Quarrelling	Physical IPV only: 16·2–64·8%; sexual IPV only: 15·3–30·5%; both physical and sexual IPV: 16·1–60·7%; emotional/economic IPV: 16·6–79·1%	Programmes to promote healthy communication and conflict resolution skills, combined with gender and rights (ie, Stepping Stones programme)
Higher number of sexual partners	Physical IPV only: 19·2–38·3%; sexual IPV only: 25·4–48·8%; both physical and sexual IPV: 33·7–67·1%; emotional/economic IPV: 10·1%	Interventions that provide sexual reproductive health services and information for young people; school-based interventions that enhance knowledge and skills of young people, especially boys, to develop healthy sexual relationships; and communications campaigns that address male sexual entitlement
Ever had sex with a sex worker or transactional sex	Physical IPV only: 6·7%; sexual IPV only: 24·4–32·2%; both physical and sexual IPV: 32·7%	See above
Controlling behaviour	Physical IPV only: 3·6–14·3%; sexual IPV only: 5·0–8·9%; both physical and sexual IPV: 6·7–10·5%; emotional/economic IPV: 0·1–20·7%	Community-based interventions that challenge men's controlling behaviour and build positive social norms towards gender equality
Low gender equity	Physical IPV only: 12·0%; both physical and sexual IPV: 20·4–23·4%	Programmes targeting men and boys to promote gender-equitable attitudes and behaviours (ie, gender equity movement in schools [GEMS]; SASA! programme)
Victimisation history		
Childhood emotional abuse	Physical IPV only: 24·6–41·2%; sexual IPV only: 20·9–64·8%; both physical and sexual IPV: 42·0–72·8%; emotional/economic IPV: 27·8–56·3%	Positive and non-violent parenting interventions to foster healthy, non-violent, and safe home environments; awareness-raising programmes to address the social tolerance of violence against children; psychosocial programmes to help children to recover from experiences of abuse and neglect; communications campaigns to raise awareness about men's own experiences of sexual violence; and psychosocial support services for male and female victims of sexual violence
Childhood physical abuse	Physical IPV only: 23·0%–34·6%; sexual IPV only: 12·7%; both physical and sexual IPV: 42·2–46·1%; emotional/economic IPV: 13·1–22·3%	See above
Childhood sexual abuse	Physical IPV only: 11·7–24·2%; sexual IPV only: 9·1–27·2%; both physical and sexual IPV: 17·7–34·9%; emotional/economic IPV: 26·6%	See above
Witnessed abuse of mother	Physical IPV only: 14·8–28·2%; sexual IPV only: 8·0%; both physical and sexual IPV: 24·0–25·1%	See above
Sexual victimisation (including rape)	Sexual IPV only: 3·3%; both physical and sexual IPV: 6·7–11·3%	See above
Psychological factors and substance misuse		
Depression	Physical IPV only: 12·5–33·1%; sexual IPV only: 8·7–23·4%; both physical and sexual IPV: 13·2–65·0%; emotional/economic IPV: 9·2–36·2%	Interventions to increase accessibility and affordability of mental health care for men and women
Alcohol misuse	Physical IPV only: 5·5%; sexual IPV only: 14·9%; both physical and sexual IPV: 22·3%; emotional/economic IPV:7·8%	Policies and programmes to improve health services and substance abuse programmes; policies to reduce availability and access to alcohol
Social characteristics		
Present food insecurity	Sexual IPV only: 31·1–37·3%; both physical and sexual IPV: 37·0–54·1%	Policies and programmes to enhance economic empowerment of men and women, including improvement in access to credit, development of job skills, and access to decent employment benefits
No high school	Physical IPV only: 28·0–32·4%; both physical and sexual IPV: 62·0%	Policies and programmes to ensure universal access to secondary education for all
Participation in violence outside the home		
Involved in gangs	Physical IPV only: 3·9%; sexual IPV only: 8·2%; both physical and sexual IPV: 9·4–13·4%; emotional/economic IPV: 12·9%	Policies and programmes that address criminal, gang, and organised violence, including rehabilitation of juvenile offenders and weapon control; and community-based interventions coupled with communication campaigns to promote non-violence models of masculinity
Involved in fights with weapons	Sexual IPV only: 7·8%; both physical and sexual IPV: 24·1–32·2%	See above

PAF=population-attributable fraction. IPV=intimate partner violence. *When a single PAF value is presented, this is because this factor was significant only in one country.

Table 5: **Factors associated with lifetime IPV perpetration, ordered by PAF values (highest to lowest) and linked to possible prevention interventions**

lower prevalence rates in these countries; however, again this link is not conclusive because other measures of gender equality, such as the gender empowerment measure, do not show the same association. The low rates of IPV in Indonesia are supported by other research suggesting that this situation could be partly attributable to strictly enforced religious bans on drinking and low rates of exposure to violence during childhood.[28]

The different patterns of partner violence perpetration that exist within the Asia-Pacific region could be partly accounted for by sociocultural differences. Almost all IPV perpetration in Bangladesh and Sri Lanka (south Asia) occurs within marriage, and physical violence on its own is more common than is sexual only violence. However, in both Cambodia and Indonesia (southeast Asia), sexual partner violence is more common than is physical partner violence. This finding is supported by

Panel 2: Research in context

Systematic review

In peer-reviewed published literature, data for prevalence of intimate partner violence perpetration estimates from a large population-based sample have been reported only from the USA, Europe, Brazil, South Africa, India, and Bangladesh. In preparation for our study, we undertook an internet literature search with PubMed and Google and searched references cited in the papers. We used the following search terms: "intimate partner violence", "domestic violence", "partner violence", "marital rape", "sexual coercion", "perpetration", "etiology", "aetiology", and "risk factors". We sought published papers or reports with empirical research on intimate partner violence perpetration from 1990 onwards, from any country, published in English, and drew on previous systematic reviews. The review found that poverty, a low level of education, adverse childhood experiences (abuse), alcohol abuse, antisocial personality disorder, attitudes condoning violence, relationship discord, and having several partners are key risk factors for intimate partner violence perpetration.

Interpretation

This large multicountry study provides evidence that intimate partner violence, including sexual violence (partner rape), is highly prevalent in men in the general population across a diverse range of settings in the Asia-Pacific region. Our findings show that the prevalence and patterns of, and factors associated with, intimate partner violence perpetration vary across settings, which emphasises the need for site-specific data and interventions. The study draws attention to the importance across cultural and worldwide settings of the factors already described as associated with intimate partner violence perpetration in the published literature, and provides new evidence that factors associated with physical and sexual partner violence perpetration vary and need to be addressed in different ways. Population-attributable fractions indicate that to address gender-inequitable social norms and gender-inequitable constructions of masculinity is of the highest importance, as is to intervene in the cycle of abuse in families.

other studies of women in Thailand[1] and Indonesia.[28] The Indonesia study[28] suggests that higher rates of sexual partner violence might be related to gender norms based on culture and religion that confer absolute sexual control of men over women.

A multivariate model of factors associated with physical or sexual partner violence, or both, as one outcome have been presented elsewhere;[15] the correlated factors were the same as in this analysis, and the strength of associations varied only slightly. However, multinomial analysis in this paper enabled us to study, for the first time, whether physical and sexual partner violence perpetration can be regarded as part of the same pattern of violence or not. According to the findings, not all perpetrators use all types of violence, and although some overlap exists between physical and sexual partner violence, this is not always the case. Data in table 2 show that for some sites, such as Bangladesh and the Indonesian urban and rural sites, the overlap is small. However in Bougainville (Papua New Guinea) and Jayapura (Indonesia), the proportion of men who use both physical and sexual violence is higher. This finding differs notably to published work from other regions of the world that suggests that physical and sexual partner violence usually occur together.[3] Furthermore, physical and sexual partner violence have some shared correlates but also some unique ones. Physical partner violence perpetration was associated with low levels of education, experiences of physical and emotional childhood victimisation, gender-inequitable attitudes, conflict within the relationship, depression, and alcohol misuse, which is consistent with the published scientific literature.[10,20,29,30] Although frequent quarrelling was reported to be strongly associated with physical IPV, more analysis is needed to understand whether this factor is part of the IPV phenomenon or is a pathway variable. In this study, we measured "depression" as existing depression and thus we cannot be sure whether it occurred before or after violence perpetration, although other studies suggest that it is bidirectional.[31] Emotional abuse and neglect, which has been rarely researched as a risk factor for partner violence perpetration, was found in this study to be a stronger and more consistent risk factor for partner violence perpetration than was childhood physical or sexual abuse.

Male perpetration of sexual violence alone against their partners was associated with experiences of childhood sexual and emotional abuse, but not physical abuse. Sexual only IPV perpetration was not associated with gender-inequitable attitudes, but was strongly associated with having multiple sexual partners and engaging in transactional sex. This finding suggests that sexual violence perpetration is indicative of a preoccupation with demonstration of (hetero)sexual performance and sexual dominance over women, and is associated with emotionally detached sex, as suggested by other investigators.[32–34] These factors also relate to norms of masculinity that emphasise toughness and dominance over other men, which also prevail in involvement with gangs and fights with weapons.[35–37] Factors associated with perpetration of sexual IPV seem to be more similar to those associated with non-partner sexual violence than those associated with physical IPV, which suggests that men who use sexual violence might need specific interventions.[34]

Another new and important finding of this study is that the factors associated with IPV perpetration vary across countries. Factors related to poverty were only associated with IPV perpetration in the least developed countries. Depression was mainly relevant in Cambodia and Bangladesh. Alcohol consumption was understandably

not a significant factor in the Muslim-majority societies: Bangladesh and Indonesia. Men's gender attitudes were important only in Bangladesh and Cambodia, which are countries that have more strongly inequitable attitudes to gender overall. This finding is supported by the WHO Multi-country Study, which recorded a significant association between attitudes condoning violence among women and experiences of IPV in only eight of 15 sites.[17] Nevertheless, other practices related to gender inequality, such as controlling behaviour by men and sexual practices that objectify women, were strongly associated with IPV perpetration. This finding has also been reported by other investigators.[7,11,21] Thus, along with addressing of individual attitudes, prevention interventions should focus on men's identities and social norms that might be more causally related to perpetration of IPV.

This study has some limitations. Most samples were not nationally representative and thus typify only the sites included. Only some countries, and a few sites within most of these countries, were included—therefore, the findings do not represent the whole Asia-Pacific region. The extent of generalisability beyond the sample is unclear, but the demographics of the sample were similar to overall population data, and the higher educational level of our sample would probably result in a lower prevalence of IPV perpetration than actually exists because high school education was a protective factor against IPV. Sample design and household selection did vary across sites; however, these differences are unlikely to affect the findings because all methods resulted in representative samples with no particular biases related to outcomes. The full questionnaire, as developed for this study, had not been previously validated but it used several established scales and was validated in each country through cognitive interviews. Lifetime IPV might not be very sensitive to change in the short-term. Non-response bias could have occurred, but response rates were generally high. Violence perpetration, especially of sexual violence, might have been under-reported because it is a private, antisocial behaviour. However, the use of self-completion for sensitive questions probably reduced under-reporting. Bangladesh did not have exactly the same questions about sexual partner violence as the other countries, which could affect reported prevalence (see table 3). Multinomial analysis of the combined dataset increases the power because of a higher number of results; however, it also hides diversity and therefore the focus of the paper is on country-level analysis. Country PAFs have an underlying assumption of causality, yet because this was a cross-sectional study we cannot know whether or not associations are causal. Furthermore, although presented at the country level, PAFs represent only the sampled sites, not the entire country, and thus could hide subnational differences. PAFs should therefore be interpreted as an indication of the relative importance of associated factors, rather than interpreted literally.[38]

This is a regional multi-country study, but the findings are of notable worldwide interest because most of the world's population lives in this region and the countries within it are culturally diverse. This study has contributed new knowledge about the prevalence, patterns, and associated factors for IPV perpetration to complement what we already know from interviews with women. It emphasises the importance of prevention, because of the high prevalence rates and because most correlated factors are amenable to change with long-term interventions. The study emphasises the importance of comprehensive interventions to address gender inequality and practices that legitimatise men's control over women; challenge notions of masculinity that promote heterosexual dominance; intervene in the cycle of abuse in families;[39] improve access to mental health services; and address community violence (panel 2). The findings underscore the need for country-specific data to develop interventions that respond directly to the specific patterns and drivers of violence in unique contexts, and recognise that it might be necessary to address physical and sexual violence in different ways.

Contributors

EF was the lead author and the research coordinator of the study. She contributed to the study design and data collection, and led the data analysis, interpretation, and writing of the report. RJ also contributed to the study design and data collection in some sites, and contributed equally to the data analysis. She also contributed to data interpretation and writing of the report. TR was responsible for data collation and cleaning, statistical analysis, and the development of tables and figures. CG-M was a technical adviser on the study design and contributed to data interpretation and reviewing of the report. The listed authors were writing on behalf of the UN Multi-country Study team, which included the principal investigators and country study teams who contributed to the study implementation and data collection at each site. We also write on behalf of the steering committee and technical advisory group who guided the overall study design and implementation.

Conflicts of interest

We declare that we have no conflicts of interest.

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