



# Is intimate partner violence associated with HIV infection among women in the United States?☆

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## Abstract

**Objective:** This study sought to examine the association between intimate partner violence (IPV) and human immunodeficiency virus (HIV) infection among a large representative sample of US women.

**Methods:** Data came from the National Epidemiologic Survey on Alcohol and Related Conditions (age, 20 years and older). The present analysis utilized the subsample of women who reported being in a relationship in the last year ( $n=13,928$ ). Participants were asked whether they had experienced physical or sexual violence from their partner in the last year, as well as whether they had been diagnosed with HIV by a health care professional.

**Results:** Past year IPV and HIV prevalence estimates among women in romantic relationships in the United States were 5.5% and 0.17%, respectively. In models adjusting for sociodemographic factors and risky sexual behaviors (e.g., age of first intercourse), IPV was significantly associated with HIV infection (adjusted odds ratios=3.44, 95% confidence interval=1.28–9.22). We also found that 11.8% of the cases of HIV infection among women were attributable to past year IPV.

**Conclusions:** The present study demonstrates a strong association between IPV and HIV in a representative sample of US women. Screening and prevention programs need to be aware of this important association.

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**Keywords:** Intimate partner violence; Sexual behavior; HIV; Risk factors; Epidemiology

## 1. Introduction

Intimate partner violence (IPV) [1,2], which describes physical or sexual assault, or both, of a spouse or sexual intimate, has emerged as a significant public health concern around the world [3,4]. Lifetime and past year prevalence rates of IPV reported by women have been 25–30% and 8–14%, respectively [2]. There has been increased awareness of the wide range of mental [3] and physical health consequences of IPV [5]. An area of specific concern has been

the association between IPV and sexually transmitted diseases [6].

Recent evidence points to the association between IPV and human immunodeficiency infection (HIV) among women in India [7] and Africa [8,9]. Although studies in US samples have found that IPV is associated with HIV sexual risk behaviors (lack of condom use, multiple partners) [10–12], these studies have not found [13,14] a significant association between IPV and HIV infection. Two explanations exist for these discrepant findings. First, it is possible that the findings in developing countries may not be generalizable to the United States due to differences in prevalence of IPV across countries [4]. Second, the US studies have not been sufficiently powered to detect an association between IPV and HIV. To date, US studies on the relationship between IPV and HIV infection have been limited by smaller sample sizes (between 400 and 1500

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women) [10] in comparison with studies in India (over 28,000 women) and Africa (1700–28,000 women) [7]. Also, US studies on this topic have not been population-based and are limited by selection bias.

We aimed to further this important area of inquiry by (1) addressing whether an association exists between IPV and HIV in a large nationally representative sample of US women and (2) examining the population attributable fraction (PAF) of HIV infection associated with IPV.

## 2. Method

### 2.1. Sample

Data came from the National Epidemiologic Survey on Alcohol and Related Conditions Wave 2 ( $N=34,653$ ; age, 20+; response rate, 70.2%), a nationally representative sample of the US civilian, noninstitutionalized, adult population conducted in 2004–2005 [15–17]. This survey was conducted by the National Institute on Alcohol Abuse and Alcoholism using face-to-face interviews assisted by laptop software with built-in skip, logic and consistency checks. Wave 1 was conducted in 2000–2001 using 43,093 respondents, while Wave 2 was conducted in 2004–2005 using an identical methodology with 34,653 of the original respondents. Excluding those ineligible for the Wave 2 interview due to causes such as death, deportation or mental or physical impairment, this represents a follow-up response rate of 86.7%. The cumulative response rate for Wave 2 is 70.2%, based on the follow-up response rate and the Wave 1 response rate of 81.0%. Informed consent was obtained from all respondents prior to interviews. More detailed information on the methodology, sampling and weighting procedures can be found in other publications [17]. For the purpose of the current study, analyses were restricted to the subsample of women who reported being married, dating or involved in a romantic relationship sometime in the year prior to the Wave 2 interview ( $n=13,928$ ).

### 2.2. Measures

#### 2.2.1. Intimate partner violence

Respondents were asked about physical and sexual violence from their partner in the past 12 months using an adapted version of the Conflict Tactics Scale [18,19] in accordance with the World Health Organization recommendations [20]. These questions were prefaced with the following statement, “No matter how well a couple gets along, there are times when they disagree, get annoyed with one another, or just have spats or fights.” Physical IPV was assessed with five questions. Respondents were asked how often in the past 12 months their spouse or partner (1) pushed, grabbed or shoved them; (2) slapped, kicked, bit or hit them; (3) threatened them with a weapon like a knife or gun; (4) cut or bruised them; and (5) injured them enough that they had to get medical care. Sexual IPV was assessed with one question: respondents were asked how often in the

past 12 months their spouse or partner forced them to have sex. Two dependent variables were created. The first differentiated individuals who endorsed at least one IPV item (either physical or sexual) in the last 12 months from those who did not. The second was a four-category variable that separated individuals who endorsed physical and sexual IPV from those who endorsed sexual IPV only, physical IPV only and no IPV.

#### 2.2.2. HIV/AIDS

Medical conditions were assessed in a section asking respondents if, in the last 12 months, a doctor or other health professional had told them they had the listed medical conditions. One item asked whether respondents had been told they had tested positive for HIV, the virus that causes AIDS, and a second item asked if they had been told they had AIDS. Responses to these two questions were combined to identify individuals who had been told by a doctor or other health care professional that they had HIV/AIDS infection.

#### 2.2.3. Sociodemographic factors

Age, marital status, education and household income were examined in the current study. Age was separated into four categories (20–29, 30–44, 45–64, 65 and over), marital status into three categories (married/cohabiting, widowed/separated/divorced, never married), education into three categories (less than high school, high school or equivalent, some college or more) and household income into four categories (\$0–19,999, \$20,000–34,999, \$35,000–59,999, \$60,000 and over).

#### 2.2.4. Age of first sexual intercourse

The section assessing medical conditions and practices included several questions asking about sexual practices, including the age of the respondent when they first had sex/sexual intercourse. Respondents could either indicate an age or indicate they had never had sexual intercourse. A dichotomous variable was created based on responses to this item that separated individuals who had their first sexual intercourse between ages 12 and 17 and those who had their first sexual intercourse at age 18 or older. Individuals who had their first sexual intercourse before age 12 were excluded as this was presumed to reflect child sexual abuse, as done in previous studies [21].

#### 2.2.5. Sexually transmitted/venereal diseases

These conditions were also assessed in the medical conditions section, just as HIV/AIDS, by asking respondents if, in the last 12 months, a doctor or other health professional had told them they had the listed medical conditions. This item came directly after the HIV/AIDS questions and asked respondents if they had been told they had, “Any other sexually transmitted diseases or venereal diseases, like gonorrhea, syphilis, chlamydia or herpes.”

Table 1

The association between sociodemographic factors and self-reported diagnosis of HIV infection or AIDS by a health professional

	Health professional HIV/AIDS diagnosis		
	No ( <i>n</i> =13,842), <i>n</i> <sup>a</sup> (% <sup>b</sup> )	Yes ( <i>n</i> =30), <i>n</i> (%)	OR (95% CI)
Age			
20–29	2351 (99.9)	5 (0.1)	1.00
30–44	5228 (99.8)	15 (0.2)	2.09 (0.52–8.30)
45–64	4640 (99.9)	8 (0.1)	0.66 (0.16–2.82)
65+	1623 (99.9)	2 (0.1)	0.77 (0.10–5.64)
Marital status			
Married/cohabiting	10027 (99.9)	7 (0.1)	1.00
Widowed/separated/divorced	1891 (99.7)	10 (0.3)	5.82 (1.85–18.34)**
Never married	1924 (99.5)	13 (0.5)	9.41 (2.72–32.54)**
Education			
Less than high school	1733 (99.8)	8 (0.2)	1.00
High school or equivalent	3693 (99.7)	17 (0.3)	1.21 (0.45–3.30)
Some college or more	8416 (100.0)	5 (0.04)	0.19 (0.05–0.72)*
Household income			
\$0–\$19,999	2418 (99.5)	18 (0.5)	1.00
\$20,000–34,999	2747 (99.9)	8 (0.1)	0.24 (0.09–0.62)***
\$35,000–59,999	3621 (99.9)	2 (0.1)	0.09 (0.02–0.47)***
\$60,000+	5056 (99.9)	2 (0.1)	0.06 (0.01–0.34)***

OR, odds ratio; CI, confidence interval.

<sup>a</sup> Unweighted *n*.

<sup>b</sup> Weighted percentage.

\* *P*<.05.

\*\* *P*<.01.

\*\*\* *P*<.001.

### 2.3. Analytic strategy

All analyses employed appropriate statistical weights to ensure representativeness to the US general population. Taylor Series Linearization in the SUDAAN program was used to perform the necessary estimation of design-based

standard errors [22]. First, cross-tabulations and bivariate logistic regressions were utilized to examine relationships between sociodemographic factors and a health professional diagnosis of HIV/AIDS. Three multiple logistic regression models were then utilized to examine the relationship between past year IPV and a health professional diagnosis of HIV/AIDS: (1) unadjusted bivariate regressions, (2) regressions adjusted for sociodemographic factors significantly associated with a health professional diagnosis of HIV/AIDS (marital status, household income and education) and (3) regressions adjusted for sociodemographic factors significantly associated with a health professional diagnosis of HIV/AIDS (marital status, household income and education) as well as age of first intercourse (age 12–17 vs. age 18+) and the presence of a sexually transmitted or venereal disease. The PAF of IPV was calculated based on the following formula:  $PAF = p(OR-1)/p(OR-1)+1$  [23]. *p* is the prevalence of the exposure (IPV) and OR is the odds ratio of the association between IPV and HIV.

### 3. Results

Past year IPV and HIV/AIDS prevalence estimates among women in romantic relationships in the past year in the United States were 5.5% and 0.17%, respectively. Age was the only sociodemographic variable examined that was not associated with HIV/AIDS diagnosis (Table 1). Women that were widowed, separated or divorced [OR=5.82, 95% confidence interval (CI)=1.85–18.34] and women who were never married (OR=9.41, 95% CI=2.72–32.54) were significantly more likely than married or cohabiting women to have a diagnosis of HIV/AIDS. Women who had attended college or had higher education were significantly less likely than women who did not complete high school to have a diagnosis of HIV/AIDS (OR=0.19, 95% CI=0.05–0.72).

Table 2

The association between IPV and self-reported diagnosis of HIV infection or AIDS by a health professional

	Health professional HIV/AIDS diagnosis			AOR-1 (95% CI)	AOR-2 (95% CI)
	No ( <i>n</i> =13,842), <i>n</i> <sup>a</sup> (% <sup>b</sup> )	Yes ( <i>n</i> =30), <i>n</i> (%)	OR (95% CI)		
Any IPV					
No	12925 (99.9)	22 (0.1)	1.00	1.00	1.00
Yes	883 (99.4)	8 (0.6)	5.79 (2.10–15.97)**	3.27 (1.30–8.24)*	3.44 (1.28–9.22)*
IPV categories					
No IPV	12925 (99.9)	22 (0.1)	1.00	1.00	1.00
Physical IPV only	735 (99.5)	6 (0.5)	4.76 (1.53–14.80)***	2.72 (0.95–7.83)	2.81 (0.88–8.97)
Sexual IPV only	58 (100.0)	0 (0.0)	–	–	–
Physical+sexual IPV	90 (98.3)	2 (1.7)	17.92 (3.62–88.74)***	8.58 (1.65–44.52)*	8.47 (1.65–43.57)*

AOR-1, adjusted OR 1 with sociodemographic covariates (marital status, household income and education); AOR-2, adjusted OR 2 includes sociodemographic covariates as well as age of first intercourse (age 12–17 vs. age 18+) and presence of a sexually transmitted or venereal disease; CI, confidence interval.

<sup>a</sup> Unweighted *n*.

<sup>b</sup> Weighted percentage.

\* *P*<.05.

\*\* *P*<.01.

\*\*\* *P*<.001.

Finally, women in the three higher household income groups were significantly less likely than those in the lowest household income group to have a diagnosis of HIV/AIDS (ORs ranging from 0.06 to 0.24).

Table 2 shows the strong association between past year IPV and a health professional diagnosis of HIV/AIDS. Most significant differences persisted after adjusting for socio-demographic factors as well as age of first intercourse and presence of sexually transmitted or venereal disease. Women who experienced any IPV were over 3 times more likely than those who did not experience IPV in the past year to have a diagnosis of HIV/AIDS [adjusted OR 2 (AOR-2)=3.44, 95% CI=1.28–9.22]. When types of IPV were examined, physical IPV on its own was associated with a diagnosis of HIV/AIDS in the unadjusted model (OR=4.76, 95% CI=1.53–14.80) but did not remain significant after covariates were entered into the model. We were unable to look at sexual IPV on its own since the prevalence was too low. The combination of physical and sexual IPV was significantly associated with a diagnosis of HIV/AIDS in all three models (AOR-2=8.47, 95% CI=1.65–43.57). Lastly, we found that 11.8% (95% CI=1.5%–31.1%) of the cases of HIV infection among women were attributable to past year IPV.

#### 4. Discussion

To the best of our knowledge, the present study is the first to utilize a large representative sample of the US general population to examine the relationship between IPV and HIV. These findings are an important extension of previous work demonstrating an association between IPV and HIV [7–9] in developing countries. There are two possible explanations for the discrepancy between the findings of the present US study and previous US studies that have not found a positive association between IPV and HIV. First, the present study utilized a much larger sample size to examine this relationship than the previous studies, thus having enough power to detect an association. Second, the present study was limited by self-report assessment of HIV status in comparison with previous US studies that utilized objective assessment of HIV status. This difference in methodology is important to consider and warrants the need for replication of this finding in the US and other North American countries.

Although causal inferences cannot be made due to the cross-sectional nature of the data, the present study suggests that, in the United States, approximately 12% of HIV/AIDS infections among women in romantic relationships are due to IPV. Due to the lack of assessment of lifetime exposure to IPV, this attributable fraction is probably an underestimate. Nonetheless, 12% of HIV infection is a substantial proportion to be attributable to IPV, and policy makers need to be aware of this important association.

Maman et al. [24] highlight three plausible explanations that may work independently or in tandem to explain the association between IPV and HIV. First, HIV transmission

may occur through forced sex with an infected partner. It has been well accepted that women are biologically more vulnerable to contracting HIV than men through heterosexual encounters [25]. This vulnerability is due to the larger surface area of mucous membrane exposed during sex in women compared to men [25]. Second, emerging evidence, especially in youth [6,26], suggests that women exposed to IPV have limited or compromised negotiation of safer sex practices. Third, women at risk of IPV have also been shown to engage in sexual risk behaviors (early age of intercourse, multiple partners and substance abuse [25]). Besides these three mechanisms, there is emerging consideration in the literature that IPV and related mental disorders such as posttraumatic stress disorder, depression and trauma might be associated with a compromised immune system and poor outcomes among individuals with HIV/AIDS [27].

The findings of the present study must be interpreted within the context of the following limitations. First, the assessment of IPV was based only on a past year time frame and not assessed over the participant's lifetime. This methodology may explain the lower prevalence of IPV found in the present study compared to previous US samples [3]. Second, the assessment of HIV infection was based on self-report rather than on objective measures (e.g., saliva or blood samples) [7]. Third, due to the cross-sectional data and lack of information available on the temporal relationship between IPV and HIV infection, causal inferences cannot be made. Fourth, there were slight differences in the assessment of physical IPV between the present study (measured by four items) and previous studies in Africa and India (measured by six items) [9,28]. Finally, due to the lack of assessment of certain sexual risk behaviors (i.e., multiple partners and condom use) in the present survey, we could not adjust for these factors when examining the relationship between IPV and HIV.

Nonetheless, the present findings suggest a need for screening and prevention programs that aim to reduce IPV and HIV. Women presenting with HIV or AIDS should also be screened for IPV. Recent data suggest that women prefer self-report methods of screening rather than face-to-face screening procedures [29]. Finally, more research is needed in examining the optimal interventions to reduce HIV transmission among perpetrators of IPV. Jewkes et al. [30] utilized a cluster randomized controlled trial to test the capacity for an educational program (Stepping Stones program) — to improve the health of people in Africa. Although the incidence of HIV infection was not significantly reduced in the intervention group compared to the control group, herpes infection was reduced and perpetration of IPV was also reduced [30]. These promising initial findings require further replication.

In conclusion, the present study demonstrated a strong association between IPV and HIV infection in a large representative sample of US women. Clinicians and policy-makers need to be aware of these findings.

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## References

- [1] Ellsberg M, Jansen HA, Heise L, Watts CH, Garcia-Moreno C. 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.
- [2] Campbell JC. Health consequences of intimate partner violence. *Lancet* 2002;359(9314):1331–6.
- [3] Afifi TO, Macmillan H, Cox BJ, Asmundson GJ, Stein MB, Sareen J. Mental health correlates of intimate partner violence in marital relationships in a nationally representative sample of males and females. *J Interpers Violence* 2008.
- [4] Garcia-Moreno C, Jansen HA, Ellsberg M, Heise L, Watts CH. 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.
- [5] Olson L, Huyler F, Lynch AW, et al. Guns, alcohol, and intimate partner violence: the epidemiology of female suicide in New Mexico. *Crisis* 1999;20(3):121–6.
- [6] Raj A, Santana MC, La Marche A, Amaro H, Cranston K, Silverman JG. Perpetration of intimate partner violence associated with sexual risk behaviors among young adult men. *Am J Public Health* 2006;96(10):1873–8.
- [7] Silverman JG, Decker MR, Saggurti N, Balaiah D, Raj A. Intimate partner violence and HIV infection among married Indian women. *JAMA* 2008;300(6):703–10.
- [8] Dude AM. Spousal intimate partner violence is associated with HIV and other STIs among married Rwandan women. *AIDS Behav* 2009.
- [9] Dunkle KL, Jewkes RK, Brown HC, Gray GE, McIntyre JA, Harlow SD. Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *Lancet* 2004;363(9419):1415–21.
- [10] Gielen AC, Ghandour RM, Burke JG, Mahoney P, McDonnell KA, O'Campo P. HIV/AIDS and intimate partner violence: intersecting women's health issues in the United States. *Trauma Violence Abuse* 2007;8(2):178–98.
- [11] El-Bassel N, Gilbert L, Wu E, et al. Intimate partner violence prevalence and HIV risks among women receiving care in emergency departments: implications for IPV and HIV screening. *Emerg Med J* 2007;24(4):255–9.
- [12] Wu E, El-Bassel N, Witte SS, Gilbert L, Chang M. Intimate partner violence and HIV risk among urban minority women in primary health care settings. *AIDS Behav* 2003;7(3):291–301.
- [13] Burke JG, Thieman LK, Gielen AC, O'Campo P, McDonnell KA. Intimate partner violence, substance use, and HIV among low-income women: taking a closer look. *Violence Against Women* 2005;11(9):1140–61.
- [14] McDonnell KA, Gielen AC, O'Campo P, Burke JG. Abuse, HIV status and health-related quality of life among a sample of HIV positive and HIV negative low income women. *Qual Life Res* 2005;14(4):945–57.
- [15] Grant BF, Harford TC, Dawson DA, Chou PS, Pickering RP. The Alcohol Use Disorder and Associated Disabilities Interview schedule (AUDADIS): reliability of alcohol and drug modules in a general population sample. *Drug Alcohol Depend* 1995;39(1):37–44.
- [16] Compton WM, Grant BF, Collier JD, Glantz MD, Stinson FS. Prevalence of marijuana use disorders in the United States: 1991–1992 and 2001–2002. *JAMA* 2004;291(17):2114–21.
- [17] Grant B, Kaplan KD. Source and accuracy statement for the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC); 2005. Rockville (Md).
- [18] Straus MA. Measuring intrafamily conflict and violence: The Conflict Tactics (CT) Scales. In: Straus MA, Gelles RJ, editors. *Physical violence in American families: risk factors and adaptations to violence in 8,125 families*. New Brunswick (NJ): Transaction; 1990. p. 29–47.
- [19] Ruan WJ, Goldstein RB, Chou SP, et al. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of new psychiatric diagnostic modules and risk factors in a general population sample. *Drug Alcohol Depend* 2008;92(1-3):27–36.
- [20] World Health Organization. Putting women first: ethical and safety recommendations for research on domestic violence against women. <http://www.who.int/gender/violence/womenfirtseng.pdf> [Accessed February 13, 2008].
- [21] Mota N, Cox BJ, Katz LY, Sareen J. Relationship between mental disorders/suicidality and three sexual behaviors: results from the National Comorbidity Survey Replication. *Arch Sex Behav* 2009 Feb 14 [Epub ahead of print].
- [22] Shah BV, Barnswell BG, Bieler GS. SUDAAN user's manual: software for analysis of correlated data. Research Triangle Park (NC): Research Triangle Institute; 1995.
- [23] Young TK. *Population health: concepts and methods*. New York (NY): Oxford University Press; 2005.
- [24] Maman S, Campbell J, Sweat MD, Gielen AC. The intersections of HIV and violence: directions for future research and interventions. *Soc Sci Med* 2000;50(4):459–78.
- [25] Campbell JC, Baty ML, Ghandour RM, Stockman JK, Francisco L, Wagman J. The intersection of intimate partner violence against women and HIV/AIDS: a review. *Int J Inj Control Saf Promot* 2008;15(4):221–31.
- [26] Teitelman AM, Ratcliffe SJ, Morales-Aleman MM, Sullivan CM. Sexual relationship power, intimate partner violence, and condom use among minority urban girls. *J Interpers Violence* 2008;23(12):1694–712.
- [27] Leserman J. Role of depression, stress, and trauma in HIV disease progression. *Psychosom Med* 2008;70(5):539–45.
- [28] Decker MR, Miller E, Kapur NA, Gupta J, Raj A, Silverman JG. Intimate partner violence and sexually transmitted disease symptoms in a national sample of married Bangladeshi women. *Int J Gynaecol Obstet* 2008;100(1):18–23.
- [29] MacMillan HL, Wathen CN, Jamieson E, et al. Approaches to screening for intimate partner violence in health care settings: a randomized trial. *JAMA* 2006;296(5):530–6.
- [30] Jewkes R, Nduna M, Levin J, 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.