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Associations between Intimate Partner Violence, Violence-Related Policies, and HIV Diagnosis Rate Among Women in the United States

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Abstract

Purpose.—To assess the association between state-level intimate partner violence (IPV) prevalence and HIV diagnosis rates among women in the US and investigate the modifying effect of state IPV healthcare policies.

Methods.—Data were collected on HIV diagnosis rates from HIV surveillance from 2010 to 2015 and IPV prevalence was collected from the National Intimate Partner and Sexual Violence Survey from 2010 to 2012. States were coded for IPV healthcare policies on training, screening, reporting, and insurance discrimination.

Results.—States with higher IPV prevalence was associated with higher HIV diagnoses among women ($B = .24$, 95% confidence interval [CI] = .003, .04, $P = .02$). State policies were a significant effect modifier ($B = -.05$, 95% CI = $-.07$, $-.02$, $P < .001$). Simple slopes revealed that the association between IPV and HIV diagnosis rates was stronger in states with low IPV protective healthcare policies ($B = .09$, CI = .06, .13, $P < .001$) and moderate IPV protective policies ($B = .05$, 95% CI = .02, .07, $P < .001$), but not in states with high IPV protective policies ($B = -.009$, 95% CI = $-.04$, .02, $P = .59$).

Conclusions.—HIV prevention programs should target IPV and link to community resources. IPV-related policies in the healthcare system may protect the sexual health of women experiencing IPV.

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Disclosures

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Introduction

According to recent epidemiological trends, optimizing HIV prevention strategies for women is a public health priority. In the United States, women represent one-fifth of new HIV diagnoses.¹ Despite declines in HIV diagnoses and the development of pre-exposure prophylaxis (PrEP), women in racial and ethnic communities continue to experience a high burden of the HIV epidemic. The primary mode of HIV transmission among women is heterosexual sex with a male partner.¹ Since heterosexual sex is a strong driving force behind women's HIV diagnoses, it is imperative that social and behavioral research focus on how relationship dynamics influence women's susceptibility to HIV.

A large body of research suggests that intimate partner violence (IPV) is a strong predictor of HIV susceptibility and infection among women.²⁻⁵ Women who are physically and/or sexually assaulted by an intimate partner are at greater risk for HIV compared to women in nonviolent relationships.^{4,6} Women who experienced IPV may have been sexually assaulted by a risky male partner, which directly affects her HIV susceptibility.^{2,5} IPV can also impact HIV susceptibility if women feel unable or have difficulty negotiating safe sex practices with the abusive partner.² It is clear that relationship-level factors such as IPV can influence individual-level HIV risk factors among women, but structural-level factors such as policies may represent a unique opportunity to reduce HIV diagnoses among women.

In public health research, there is considerable support to understand how policy contexts act as structural determinants of population health. For example, emerging research suggests that inclusive state policies regarding sexual orientation buffers the association between sexual orientation status and poor mental health.⁷ Further, recent research has documented pathways through which varying state and municipal policies shape HIV vulnerability for Latino migrants.⁸ For example, occupational and health laws can reduce job stress, increase health care access, and potentially reduce HIV vulnerability.⁸ Policies are potentially modifiable structural determinants of population health, however, little is known about the potential health impact of IPV-related policies.

Therefore, the current study sought to contribute to the integrated literature on IPV and HIV in two distinct ways. First, the majority of integrated IPV and HIV research uses individual-level data. However, our study incorporates a population health approach by utilizing state-level data across six time points to further understand the association between IPV and women's HIV diagnosis rate. Consistent with previous research, we predicted a positive association between IPV prevalence and women's HIV diagnosis rates. Second, no study has examined the modifying effects of IPV-related policies in the context of IPV and HIV. Thus, we examined IPV-related policies within the healthcare system as an effect modifier on the association between IPV prevalence and women's HIV diagnosis rates. IPV-related policies in the healthcare system was the primary focus because some evidence suggest that changes within the healthcare system could improve health outcomes for women who experience IPV.⁹ We predicted that more IPV-related policies within the healthcare system would buffer the association between IPV prevalence and women's HIV diagnosis rates.

Methods

Study Population

We obtained IPV prevalence data from the 2010–12 National Intimate Partner and Sexual Violence Survey.¹⁰ We also obtained data on HIV diagnoses rates from the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP) Atlas, an online databased containing CDC surveillance data.¹¹ For covariates, we also obtained data based on 5-year estimates from the American Community Survey. The current study used HIV surveillance data from 2010–2015 for 49 states and the District of Columbia for non-Hispanic Black (hereafter known as Black), Hispanic, and non-Hispanic White (hereafter known as White) women. New Hampshire suppresses state-level HIV diagnosis data and state-level IPV prevalence estimates are unavailable for Puerto Rico. Our final study population was $N = 900$ (i.e., 50 states over 6 years stratified by 3 racial and ethnic groups). We stratified by 3 racial and ethnic groups (Black, Hispanic, and White women) because of the racial disparity in women's diagnosis rates.

Measures

State IPV prevalence.—State-level prevalence estimates for IPV was obtained from the 2010–12 National Intimate Partner and Sexual Violence Survey.¹⁰ The National Intimate Partner and Sexual Violence Survey (NISVS) is a nationally representative survey that assessed experiences of sexual violence, stalking, and intimate partner violence among adult women and men in the United States and for each individual state.¹² This survey is a random digit dial telephone survey of the non-institutionalized English and Spanish-speaking U.S. population aged 18 years and older.¹² For the current analysis, an overall composite variable was used for state-level IPV prevalence estimates for: 1) contact sexual violence, physical violence, and/or stalking (hereafter known as IPV). The NISVS defines contact sexual violence as “a combined measure including rape, being made to penetrate someone else, sexual coercion, and/or unwanted sexual contact”; stalking as “a pattern of harassing or threatening tactics used by a perpetrator that is both unwanted and causes fear or safety concerns in the victim”; and physical violence as “a range of behaviors from slapping, pushing or shoving to severe acts that include hit with a fist or something hard, kicked, hurt by pulling hair, slammed against something, tried to hurt by choking or suffocating, beaten, burned on purpose, and used a knife or gun.”¹⁰

State IPV policies.—We examined 5 state-level policies regarding IPV and the healthcare system: 1) states prohibiting health insurance discrimination (i.e., insurance companies that deny coverage or increase premiums because of history of IPV); 2) states mandating reporting by healthcare professionals for specified injuries and suspected abuse; 3) states requiring partner violence healthcare protocols; 4) states requiring partner violence screening by healthcare professionals; and 5) states requiring training on partner violence for healthcare professionals. States were coded 1 (present policy) or 0 (absent policy) based on 2010 policies and legislations and from the State Compendium of Domestic Violence and Healthcare Policies drafted by the Family Violence Prevention Fund.¹³ A count variable was created by summing the responses from the 5 state-level policy variables.

State HIV diagnosis.—For the current analysis, we included all diagnosis rates of HIV infection reported to the CDC from 2010 to 2015 among Black, Hispanic, and White women aged 13 years and older residing in 49 states and the District of Columbia. Women's HIV diagnosis rates for each state was obtained through the CDC's HIV surveillance data and calculated as: state's population size in the given time period divided by the number of diagnoses of HIV infection in the state and multiplied by 100,000.

State covariates.—State percentage of women, of Blacks or African Americans, of Hispanics were considered as covariates. We obtained 5-year estimates for these covariates through US Census from 2010 – 2015.¹⁴

Statistical Analysis

Using regression analyses, we conducted a trend analysis in women's HIV diagnosis rates from 2010 to 2015. Next, we examined the association between state-level IPV prevalence estimates and state-level HIV diagnosis rates for Black, Hispanic, and White women across 6 time points (from 2010–2015). We used a linear mixed model with random effects to account for clustering for 6 time points. First, we examined the unadjusted relationship between state-level IPV prevalence and state-level HIV diagnosis rates. Next, we adjusted for state-level demographic covariates that were significantly related to HIV diagnosis rates (% of women, % of Black or African Americans, % of Hispanic). Finally, we examined whether the interaction between the state-level IPV prevalence and state-level IPV healthcare policy variable was significant. The continuous predictors (i.e., IPV prevalence, state IPV policies) were mean-centered to reduce multicollinearity. The procedure defined by Aiken, West, Reno¹⁵ was used to determine significance of the interaction. Slope lines were plotted at one standard deviation above and below mean levels of state IPV policies. The interaction directly tested whether the association between state-level IPV prevalence and women's HIV diagnosis rates differed across the number of state IPV policies. Analyses were conducted in SPSS 24.0. (IBM SPSS Statistics, 2012) Statistical significance was assessed at $P < .05$.

Results

There was variation in state-level lifetime prevalence estimates for IPV against women.¹⁰ Kentucky (45.3%), Nevada (43.8%), and Alaska (43.3%) had the highest estimated prevalence for IPV. South Dakota (27.8%), North Dakota (29.7%), and New York (31.7%) had the lowest estimated prevalence for IPV.

There was variation in state-level policies regarding IPV and the healthcare system. The average number of IPV policies in a state is 2.44 (SD = 1.07). Among the 49 states and D.C., 8 (16%) had at least one policy, 23 (46%) had two policies, 11 (22%) had three policies, 5 (10%) had four policies, and 3 (6%) had five policies (Figure 1).

Significant results emerged from the trend analyses in women's HIV diagnosis rates (Figure 2). Compared to 2010, the declines in HIV diagnosis rates in 2013 ($B = -6.07$, 95% confidence interval [CI] = $-11.36, -.79$, $P = .02$) and 2015 ($B = -5.53$, 95% confidence interval [CI] = $-10.82, -.25$, $P = .04$) were significantly different. HIV diagnosis rates

appear to decline for Black and Hispanic women and remain stable for White women. However, compared to White women, rates were significantly higher for Black women ($B = 31.4$, 95% confidence interval [CI] = 28.73, 34.41, $P < .001$) and Hispanic women ($B = 4.92$, 95% confidence interval [CI] = 1.90, 7.94, $P = .02$) across time.

Table 1 displays the results from the regression models. In the unadjusted models, IPV was positively associated with higher rates of HIV diagnosis ($B = .05$, 95% confidence interval [CI] = .02, .08, $P < .001$). After controlling for covariates, IPV remained significantly associated with higher rates of HIV diagnosis ($B = .02$, 95% confidence interval [CI] = .003, .04, $P = .02$).

Next, the IPV prevalence x state policy interaction term was significantly associated with HIV diagnosis rates among women ($B = -.05$, CI = $-.07$, $-.02$, $P < .001$). Further examination of the simple slopes revealed that the association between IPV and HIV diagnosis rates was stronger in states with low IPV protective healthcare policies ($B = .09$, 95% CI = .06, .13, $P < .001$) and moderate IPV protective policies ($B = .05$, 95% CI = .02, .07, $P < .001$), but not in states with high IPV protective policies ($B = -.009$, 95% CI = $-.04$, .02, $P = .59$). Figure 3 is a graphical presentation of the regression lines at the low and high levels of state policies.

Discussion

The current study examined the association between state-level IPV prevalence and HIV diagnosis rates among U.S. women and investigated the modifying effect of state IPV healthcare policies on this association. Consistent with previous research,^{2,4-6} our findings indicate that women's experiences of IPV are positively associated with women's HIV diagnosis rates on a state-level across time. Also, our findings suggest that more state-level policies integrating IPV into the healthcare system protects women who experience IPV from HIV infection. Some studies have used population-level data to analyze the association between IPV and HIV risk factors¹⁶ and infections,¹⁷ however this is one of the first studies to examine associations between IPV and women's HIV diagnosis rates across states and multiple time points. Collectively, these findings strengthen empirical claims that abusive partners are a threat to women's sexual health, and the implementation of policies within the healthcare system can have a positive impact on women's health.

Women who experience IPV face an increased HIV vulnerability due to several social and behavioral mechanisms such as coerced sex with an infected partner, compromised sexual negotiation opportunities,⁴ and poor mental health.¹⁸ Based on our findings, states with a higher prevalence of women experiencing IPV tend to also have higher diagnosis rates for HIV among women. Building from previous research, women living in states with a high prevalence of IPV might be experiencing social and behavioral mechanisms that are increasing their susceptibility to HIV. It might be useful to implement integrated IPV/HIV prevention programs in states with high IPV prevalence estimates. Further, states with policies integrating IPV into the healthcare system had a weaker IPV – HIV association. These findings highlight how policies can shape women's HIV vulnerability, in particular women who experience IPV.

Despite these compelling findings, they should be interpreted in light of limitations. While recently developed, the state-level IPV prevalence estimates are 3-year estimates from 2010 – 2012. Additional research is needed to create IPV prevalence estimates from 2013 – 2015, so future research can test associations between more current IPV estimates and women's HIV diagnoses. Further, while we used race-specific estimates for women's HIV diagnosis rates, race-specific estimates for IPV prevalence is not currently available for Black, Hispanic, and White women in all states. In order to provide a more nuanced understanding of the association between IPV and women's HIV diagnosis rates, it would be useful for future research to develop race-specific IPV estimates. Ecological studies have several advantages, such as being useful to explore large social and cultural process like policies and laws. However, associations that occur at the aggregated-level (i.e., state-level) does not guarantee an association at the individual-level. Some state-level confounders were controlled for, but there may be additional control variables unaccounted for in these analyses. Next, our findings are generalizable to those states included in these analyses and may not reflect the true experiences of women in other states and U.S. territories.

Public Health Implications

At the state-level, women's experiences of IPV are associated with HIV diagnosis rates. It is important to monitor these two parallel epidemics and understand how structural changes can be made to reduce HIV diagnosis rates among women. One potential modifiable structural change is increasing the number of integrated IPV and healthcare policies at the state-level. For example, policies that prohibit health insurance discrimination may increase women's access to health care services and access to innovative HIV prevention methods such as pre-exposure prophylaxis (PrEP). Similarly, policies that promote IPV healthcare protocols, screenings, and trainings may foster trusting relationships between patients and providers, which could create healthcare environments that are more sensitive to women's IPV experiences and potentially deter fears and anxieties that interfere with healthcare engagement. Overall, IPV-related policies in the healthcare system may be an opportunity to increase the healthcare system's response to IPV for both at-risk women and women living with HIV. Specifically, policies on IPV healthcare protocols could link at-risk women and women living with HIV to community support resources such as domestic violence agencies in order to provide support and counseling while simultaneously providing women resources to engage in biomedical HIV prevention options (i.e., PrEP)¹⁹ and retention in care and antiretroviral adherence.

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Figure 1.
State-level prevalence of IPV protective healthcare policies, 2010.

Figure 2.
Trend of HIV diagnosis rates for Black, Hispanic, and White women across 49 states and D.C., 2010–2015.

Figure 3. Intimate partner violence prevalence by IPV healthcare policy interaction for women's HIV diagnosis rate across 49 states and D.C., 2010–2015.

Table 1.

Associations Between 2010-12 State-Level IPV Prevalence and 2010-15 State-Level HIV Diagnosis Rates among Women

	B (95% CI)
IPV ^a	.05 (.02, .08) ***
IPV ^b	.02 (.003, .04) *
% of Women	.06 (−.07, .19)
% of Black or African Americans	.05 (.04, .06) ***
% of Hispanics	.02 (.01, .03) ***

^aUnadjusted association.

^bAdjusted association.

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$.