

# Physical and Sexual Violence Independently Correlated with Reduced Adherence to ART Among Women Sex Workers Living with HIV in Vancouver, Canada

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## Background

- Limited research has explored how violence affects the HIV care continuum, particularly for women and key populations such as sex workers, who experience high burden of violence globally.
- Even less is known about how these relationships function on a neighbourhood level, with limited application of spatial analytic approaches, including geographic information systems (GIS) to understanding health issues among sex workers.
- Therefore, this study used a novel approach including GIS to investigate the independent effect of spatial physical and/or sexual violence on adherence to antiretroviral therapy (ART) among sex workers living with HIV in Metro Vancouver, Canada.

## Methods

- Baseline and bi-annual questionnaire data were drawn from a prospective cohort (An Evaluation of Sex Workers' Health Access, 'AESHA', 2010-2013) of SWs and administrative data on ART dispensation (BC Centre for Excellence in HIV/AIDS Drug Treatment Program). This study is based on substantial community collaborations (e.g., sex work agencies and service providers) existing since 2005, and is monitored by a Community Advisory Board with representatives from 15+ agencies. Interviewers, outreach and nursing staff include experiential and non-experiential staff.
- Using geographic information systems and generalized estimating equations (GEE) logistic regression, we examined the independent effects of density of spatial client-perpetrated physical/sexual violence and having <95% adherence (based on proportion of days of ART dispensation within 6-month follow-up periods).
- The analysis was stratified according to residing within vs. outside the inner city epicentre of poverty, drug use and sex work scenes (downtown eastside).
- Using the kernel density function in ArcGIS, a 'threat' surface was created from the locations where sex workers reported experiencing physical/sexual violence by clients. Data for the place of residence and work environment was then laid over the 'threat' surface and buffers at two different sizes (250m, 500m) were created around each location. For each participant, a 'threat' value was measured as the average kernel density raster value within each buffer size.

## Results

- Among 66 sex workers living with HIV who previously used ART, over a 3.5-year period (208 observations), there were 74 events of <95% adherence, with 29% experiencing any physical/sexual violence.

- In bivariate GEE analysis, for buffer distances of 250m and 500m surrounding location of residence, spatial density of violence was independently correlated with reduced ART adherence within (p=0.01, 0.03) but not outside (p=0.40, 0.42) the inner city epicentre (Table 1).

**Table 1.** Bivariate and multivariable associations for the relationship between neighbourhood physical or sexual violence by clients and <95% adherence to antiretroviral therapy in the last six months for women in sex work living with HIV in Vancouver, Canada

Location variable	Buffer distance (m)	Inner city epicentre	Bivariate odds ratios (95% CIs)	P	Multivariable odds ratios (95% CIs) <sup>†</sup>	P
Residence	250	Yes	1.02 [1.00-1.03]	0.01	1.01 [1.00-1.02]	0.05
		No	0.79 [0.46-1.36]	0.40	ns	ns
	500	Yes	1.02 [1.00-1.04]	0.03	1.01 [1.00-1.02]	0.09
		No	0.79 [0.44-1.41]	0.42	ns	ns
Sexual services provided	250	Yes	1.01 [0.99-1.02]	0.55	ns	ns
		No	0.98 [0.90-1.06]	0.57	ns	ns
	500	Yes	1.00 [0.98-1.03]	0.76	ns	ns
		No	0.99 [0.91-1.08]	0.80	ns	ns

- In the multivariable GEE model adjusted for key confounders, increased density of physical/sexual violence by clients was statistically significantly correlated with <95% adherence (AOR:1.01, 95%CI:1.00-1.02) **within, but not outside**, the inner city epicentre, for a buffer distance of 250m (Table 1).

## Conclusions

- By stratifying analysis according to neighbourhood (within versus outside the inner city epicentre), we detected different patterns of how intensity of neighbourhood violence, was associated with adherence to ART among women in sex work living with HIV. Heightened intensity of neighbourhood violence was associated with reduced adherence to ART only within, and not outside, the inner city epicentre.
- This research supports global calls to address violence against SWs as part of HIV programs, tailored for neighbourhoods, and structural policy reforms including decriminalization of sex work to improve access to safer working conditions.
- Findings suggest that efforts to criminalize sex work, including new Canadian laws, could have major negative public health and human rights implications on engagement in the HIV care continuum.

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