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Influence of descriptive network norms on injection behaviors among people who inject drugs during the COVID-19 pandemic: A latent profile analysis

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BACKGROUND

Among people who inject drugs (PWID), social norms are an important environmental convention which can influence individual-level HIV risk and harm reduction behaviors, in accordance with Bandura's Social Cognitive Theory.

To better understand the association between social norms and individual behavior, two types of social norms have been identified:

- **injunctive** norms, individual-level perceptions of what is acceptable by others, and
- **descriptive** norms, the actual observed behaviors within a network.

Travel restrictions northbound at the San Ysidro Port of Entry during the COVID-19 pandemic might have exacerbated HIV risk, as they prevented cross-border mobility, and disrupted established social networks.

Cross-border drug use (CBDU) and obtainment (CBDO) on the San Diego Tijuana border have been increasing over the past decade. Drugs are generally cheaper and easier to obtain in Tijuana relative to neighboring San Diego given both drug production and supply (predominantly to the U.S.) occur in Tijuana.

Aim: To examine the influence of PWID's descriptive network norms from a person-centered perspective on HIV-related risk and harm reduction behaviors during the COVID-19 pandemic (post-implementation of border crossing restrictions).

METHODS

Data: Data for the present study were baseline and supplemental visit data of La Frontera and consisted of PWID aged ≥18 from 3 groups: (1) PWID who live in San Diego but engaged in CBDU in Tijuana in the past 2 years, (2) PWID who live in San Diego and had not been to Mexico in at least 2 years or (3) PWID who live in Tijuana and had not been to the U.S. in at least 2 years.

Statistical analyses: We used Latent Profile Analysis (LPA) to categorize PWID into empirically-based network risk-norms profiles based on the proportion of their network which engaged in specific risk behaviors(used injection and non-injection drugs, engaged in CBDO, lived in Mexico, shared a needle with the participant, offered the participant drugs, and either doubled their daily use or mixed drugs).

We used post-hoc linear and binomial logistic regression to identify associations with HIV behavioral risk and harm reduction outcomes.

RESULTS

612 participants were recruited and enrolled in the parent longitudinal study

- 399 PWID provided additional social network data of drug use alters (n=924)
- 150 San Diego residents engaged in CBDU
- 90 San Diego residents did not engage in CBDU
- 159 Tijuana residents did not engage in CBDU

The four profile model solution was found to best fit the data (Figure 1):

1. Lower HIV risk norm profile
2. Moderate HIV risk norm profile with CBDO
3. Moderate HIV risk norm profile without CBDO
4. Higher HIV risk norm profile

Regression models found that network norms were associated with HIV risk, with moderate risk and higher risk profiles positively associated with individual-level HIV risk and negatively associated with harm reduction behaviors.

Table 1. Demographic information stratified by social norm profile

	Lower risk	Moderate risk with CBDO	Moderate risk without CBDO	Higher risk	Total
# of participants	178	34	94	93	399
Mean Age (SD)	44.3 (11.1)	46.0 (11.2)	43.1 (9.79)	41.8 (9.65)	43.6 (10.5)
Mean days since last injection (SD)	1.35 (3.43)	0.559 (1.48)	1.09 (3.37)	0.796 (3.44)	1.09 (3.30)
Mean HIV Risk Index Score (SD)***	1.79 (1.03)	2.01 (1.11)	1.97 (0.965)	2.59 (1.02)	2.04 (1.06)
Mean Likert scale score of injecting with a new, sterile syringe (SD)***	4.00 (1.22)	3.62 (1.23)	3.70 (1.26)	3.51 (1.08)	3.78 (1.21)
Ever been tested for HIV***	136 (76.8%)	16 (47.1%)	58 (61.7%)	69 (74.2%)	279 (70.1%)

Figure 1. Differences in study group and CBDU by social network norm profile, stratified by higher risk social norm profiles

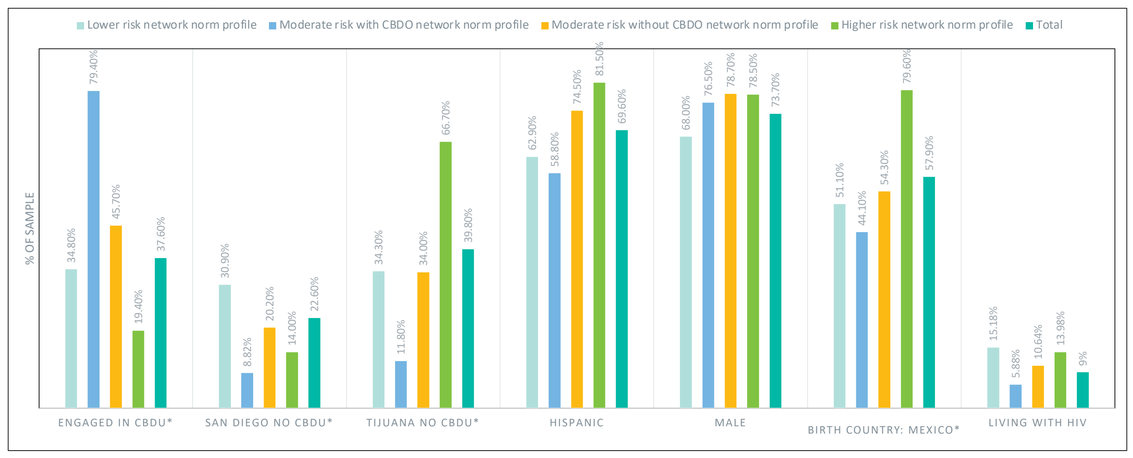

Figure 2. Gradients of social norm profiles

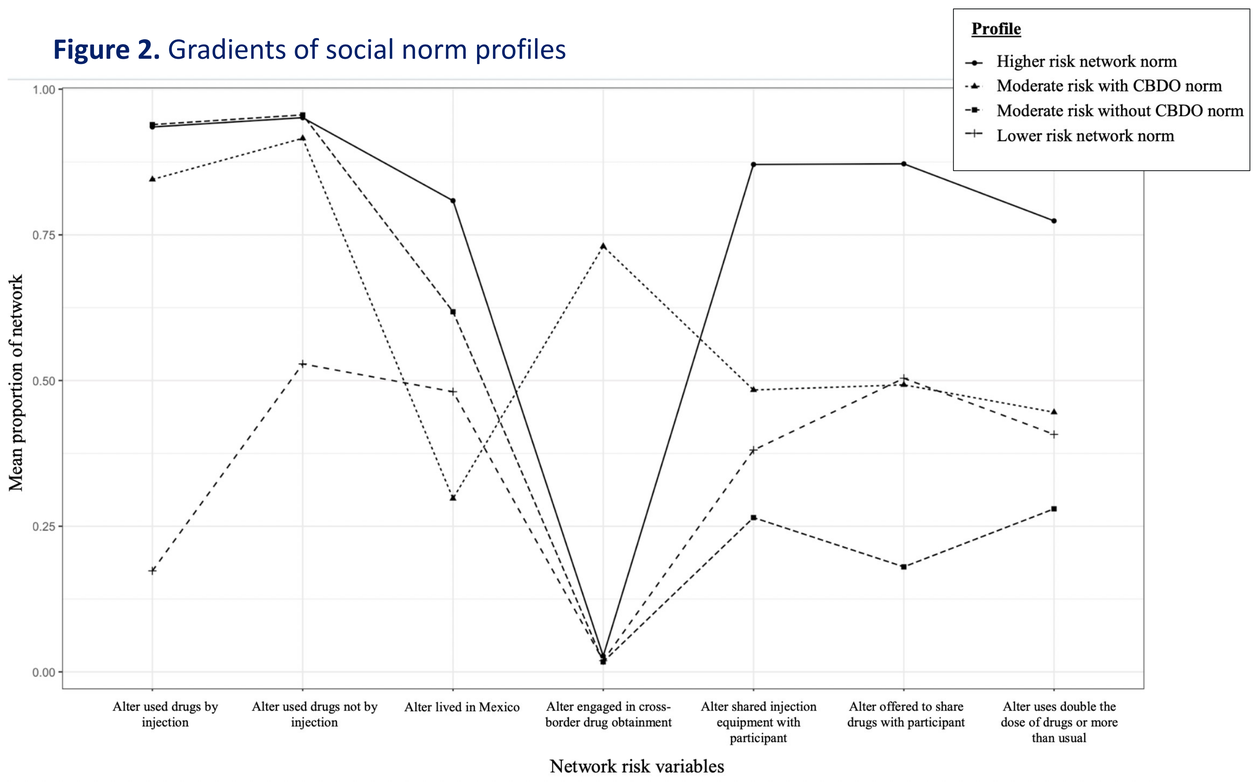

Table 2. Regression models showing differences in HIV vulnerability and harm reduction, with higher risk social norm groups having higher odds of risk behaviors

	Model A: HIV Risk*			Model B: Injected with a new, sterile syringe*			Model C: Ever tested for HIV**		
Predictors	Estimates	CI	p	Estimates	CI	p	Odds Ratios	CI	p
(Intercept)	**1.85**	**1.31 – 2.39**	**<0.001**	**3.6**	**2.95 – 4.25**	**<0.001**	0.57	0.16 – 2.03	0.38
Study group									
(Ref: PWID who engage in CBDU)									
San, Diego (no CBDU)	0.13	-0.15 – 0.41	0.354	-0.09	-0.43 – 0.24	0.586	**3.17**	**1.59 – 6.61**	**0.001**
Tijuana (no CBDU)	**0.64**	**0.40 – 0.89**	**<0.001**	**-0.41**	**-0.70 – -0.12**	**0.006**	1.48	0.86 – 2.55	0.154
Age	-0.00	-0.01 – 0.00	0.308	0	-0.01 – 0.01	0.61	1.02	1.00 – 1.04	0.083
Female sex assigned at birth	0.20	-0.02 – 0.42	0.08	-0.24	-0.51 – 0.03	0.079	1.43	0.84 – 2.49	0.192
Hispanic identity	-0.11	-0.38 – 0.16	0.434	**0.4**	**0.08 – 0.72**	**0.015**	0.72	0.37 – 1.36	0.315
Living with HIV	0.02	-0.33 – 0.37	0.916	0.1	-0.32 – 0.52	0.648	2.1	0.90 – 5.52	0.104
Alters	-0.03	-0.10 – 0.05	0.45	0.07	-0.02 – 0.16	0.119	**1.21**	**1.01 – 1.45**	**0.036**
Network risk norm profile Ref=Lower risk									
Moderate risk with CBDO	**0.40**	**0.02 – 0.78**	**0.04**	**-0.47**	**-0.93 – -0.02**	**0.041**	**0.36**	**0.16 – 0.80**	**0.013**
Moderate risk without CBDO	0.21	-0.04 – 0.47	0.096	**-0.36**	**-0.66 – -0.06**	**0.019**	**0.56**	**0.32 – 1.00**	**0.048**
Higher risk	**0.65**	**0.38 – 0.91**	**<0.001**	**-0.48**	**-0.79 – -0.17**	**0.003**	0.94	0.51 – 1.77	0.847
Observations	399			399			398		
R^2 Tjur	0.162 / 0.141			0.076 / 0.052			0.1		

***Models A and B are linear regression models; **Model C is a logistic regression model**

CONCLUSIONS

CBDU, CBDO, and place of residency play a role in HIV vulnerability and could be reduced at individual and network levels.

HIV prevention service gaps were compounded by the COVID-19 pandemic, which resulted in further cuts to the already meagre and irregular harm reduction budget in Tijuana and the disruption of health and harm reduction services in San Diego.

Study limitations may include lack of social network data (which is thought to be due to police impersonation of researchers), and use of cross-sectional data.

Interventions should intervene on HIV norm networks and specifically could:

- Leverage social diffusion interventions and peer change agents
- Use peer change agents who are PWID who refer PWID to harm reduction services or distribute and facilitate access to syringes
- Use peer educators to influence social norms by engaging in HIV harm reduction behaviors & change descriptive or communication norms of a social network.

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