

# Social And Structural Factors Associated with Greater Time Above an HIV Viral Load of 1500 Copies/ML Plasma Among Illicit Drug Users in a Canadian Setting

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## Background

- HIV-positive people who use illicit drugs (PWUD) continue to suffer from high rates of suboptimal virologic outcomes, including elevated plasma HIV-1 RNA viral load (VL).
- Although previous studies have characterized temporary increases in VL among HIV-positive PWUD, factors associated with longer periods of time with heightened HIV transmission potential have not been investigated.
- Therefore, we examined factors associated with amount of person-time spent above a VL threshold that increases risk of transmission to others among HIV-positive PWUD in Vancouver, Canada.

## Methods

- Data were derived from the AIDS Care Cohort to evaluate Exposure to Survival Services (ACCESS), a long-running prospective cohort of PWUD in Vancouver, Canada.
- Through self-referral and street-based outreach, ACCESS has enrolled HIV-positive individuals who are aged  $\geq 18$  years, have used illicit drugs other than cannabis in the previous month, reside in the Greater Vancouver Area, and provide informed written consent.
- At baseline and semi-annually thereafter, participants complete an interviewer-administered questionnaire soliciting data on socio-demographics, drug use patterns and other exposures. Participants also provide blood samples for serologic analyses. Participants are offered \$30 CAD at each study visit.
- ACCESS data were confidentially linked to a province-wide centralized HIV/AIDS registry to obtain comprehensive clinical monitoring records for each study participant.
- We used Poisson regression to longitudinally examine factors associated with person-time (in days) above a VL of 1500 copies/mL in the previous 180 days.

## Results

- Between December 2005 and May 2014, 845 HIV-positive PWUD were included in the study.
- Of the 845 participants, 581 (69%) were males and 464 (55%) self-reported Caucasian ancestry.
- 593 (70%) participants spent at least one day with a VL above 1500 copies/mL during the study period.
- In a multivariable model (Table 1), homelessness (Adjusted Rate Ratio [ARR] = 1.50; 95% confidence interval [CI]: 1.36 – 1.65), and having no sources of social support (ARR = 1.36; 95% CI: 1.23 – 1.49) were independently and positively associated with amount of time spent over 1500 copies/mL plasma.
- Age (ARR = 0.97; 95% CI: 0.97–0.98), enrollment in addiction treatment (ARR = 0.73; 95% CI: 0.65–0.82), and CD4 cell count (ARR = 0.81; 95% CI: 0.78 – 0.85) were independently and negatively associated with time spent over 1500 copies/mL plasma (Table 1).

**Table 1: Poisson regression analysis of factors associated with time above an HIV viral load of 1500 copies/mL plasma among HIV-positive people who use drugs in Vancouver, Canada (n=845)**

Characteristic	Odds Ratio (OR)	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
<b>Age</b>		
Median age	0.97 (0.96 – 0.98)	0.97 (0.97 – 0.98)
<b>Ancestry</b>		
Caucasian vs. others	0.92 (0.79 – 1.07)	
<b>Gender</b>		
Male vs. female	0.76 (0.65 – 0.88)	0.82 (0.71 – 0.95)
<b>Education</b>		
$\geq$ High school diploma vs. < high school diploma	1.10 (0.95 – 1.28)	
<b>Social support*</b>		
No sources vs. $\geq 1$ source	1.50 (1.35 – 1.67)	1.36 (1.23 – 1.49)
<b>Stable relationship*</b>		
yes vs. no	1.02 (0.89 – 1.17)	
<b>Injection drug use*</b>		
yes vs. no	1.36 (1.18 – 1.56)	1.13 (0.99 – 1.28)
<b>Non-injection drug use*</b>		
yes vs. no	1.27 (1.08 – 1.50)	1.11 (0.94 – 1.31)
<b>Heavy alcohol use*</b>		
yes vs. no	1.28 (0.99 – 1.65)	1.14 (0.87 – 1.50)
<b>Binge drug use*</b>		
yes vs. no	1.17 (1.07 – 1.29)	1.07 (0.99 – 1.17)
<b>Incarceration*</b>		
yes vs. no	1.47 (1.30 – 1.67)	1.03 (0.91 – 1.17)
<b>Homeless*</b>		
yes vs. no	1.93 (1.74 – 2.13)	1.50 (1.36 – 1.65)
<b>Addiction treatment*</b>		
yes vs. no	0.79 (0.69 – 0.90)	0.73 (0.65 – 0.82)
<b>CD4 cell count*</b>		
per 100 cells/mL	0.80 (0.77 – 0.83)	0.81 (0.78 – 0.85)
<b>ART adherence*</b>		
$\geq 95\%$ vs. < 95%	0.25 (0.22 – 0.28)	

\* Refers to last 6 months

## Discussion

- Over-two thirds of HIV-positive PWUD in this cohort were found to have a VL over 1500 copies/mL at least once during the 9-year study period.
- Periods of homelessness or lacking in social support were independently associated with greater time experiencing an elevated VL.
- These findings suggest the need for targeted prevention efforts to address modifiable factors associated with risk of HIV transmission among PWUD.

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