# Increasing rates of earlier antiretroviral treatment associated with elevated rates of optimal virologic response among HIV-positive illicit drug users during a Treatment-as-Prevention initiative in Vancouver, Canada

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## Background

- Treatment-as-Prevention (TasP) initiative seek to promptly engage HIV-positive individuals in HIV/AIDS treatment and care in order to minimise HIV/AIDS-associated morbidity, mortality and viral transmission.
- Owing to individual-, social- and structural-level barriers, HIV-positive people who use illicit drugs (PWUD) typically experience sub-optimal rates of antiretroviral therapy (ART) access, adherence and viral suppression
- TasP-based campaigns have yet to be fully evaluated among PWUD
- Additionally, there are concerns that initiating ART earlier in the disease course (i.e., at higher CD4 cell counts) among asymptomatic individuals may lead poorer adherence and degraded virologic response
- Objectives:
    1. Characterize temporal trends in CD4 cell count at ART initiation
    2. Test rates of short-term virologic response by CD4 cell count at ART initiation

## Methods

- Data were derived from the AIDS Care Cohort to evaluate Exposure to Survival Services (ACCESS), a long-running prospective cohort of community-recruited drug users in Vancouver, Canada, a setting of free and universal access to HIV care and other essential health services during a TasP-based ART scale-up effort
- Longitudinal cohort data were linked to comprehensive HIV clinical monitoring and ART dispensation records from the BC Centre for Excellence in HIV/AIDS.
- Individuals eligible for these analyses received their first dispensation of ART between December 1, 2005 and June 1, 2013
- First, we examined the study sample characteristics, stratified by year of ART initiation, and produced plots of mean CD4 cell count at initiation by year of initiation
- Second, we used multivariable linear regression to model the relationship between CD4 cell count at initiation (outcome) and year of initiation (primary explanatory variable) and other secondary explanatory variables
- Third, we plotted survival curves using Kaplan-Meier methods to visualize time to non-detectable HIV RNA viral load (VL) (i.e., < 50 c/mL) in the first 365 days following ART initiation, stratified by CD4 cell count at initiation (i.e., < 200 vs. ≥ 200 and ≤ 350 and > 350 cells/mL
- Finally, we used multivariable Cox proportional hazards regression to model the effect of CD4 cell count on time to VL non-detectability

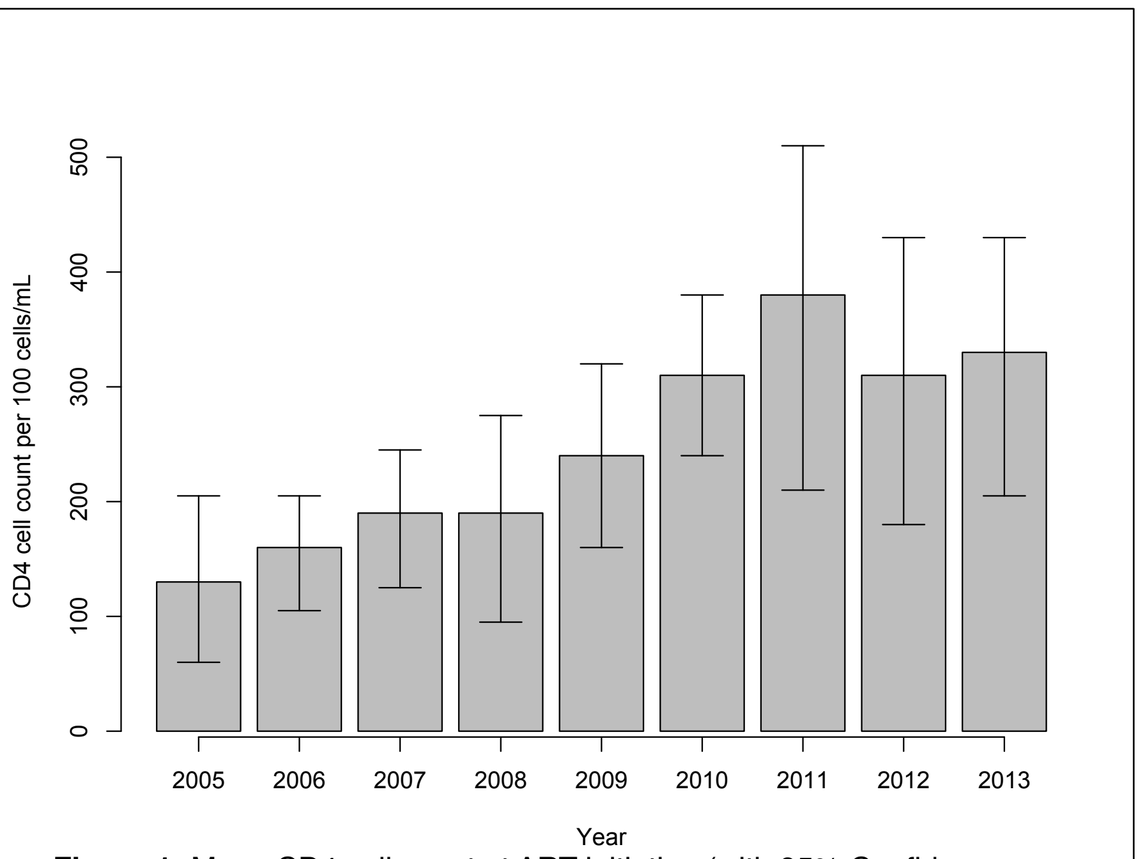


**Figure 1:** Mean CD4 cell count at ART initiation (with 95% Confidence Intervals) stratified by year of initiation among 355 PWUD initiating ART during a TasP-based initiative in Vancouver, Canada, 2005 to 2013

## Results

- Between December 1, 2005 and June 1, 2013, 816 individuals were recruited; among these, 355 (42%) received their first dispensation of ART during the study period and were eligible for these analyses
- Among these individuals, 130 (37%) reported non-male gender and 200 (56%) reported Caucasian ancestry
- Mean CD4 cell count at initiation over the study period was 200 c/mL, increasing from 130 c/mL (2005) to 330 c/mL (2013); highest value was 380 c/mL in 2011
- In a multivariable linear regression model adjusted for gender and the experience of the prescribing physician, later year of initiation was associated with an increase of 29.5 (95% Confidence Interval [95% CI]: 21.0 – 37.9) CD4 cells at initiation
- In a multivariable Cox proportional hazards regression model adjusted for age and VL at ART initiation, year of initiation was positively associated with swifter rates of virologic response (Adjusted Hazards Ratio = 1.14 per 100 cells, 95% CI: 1.06 – 1.23)

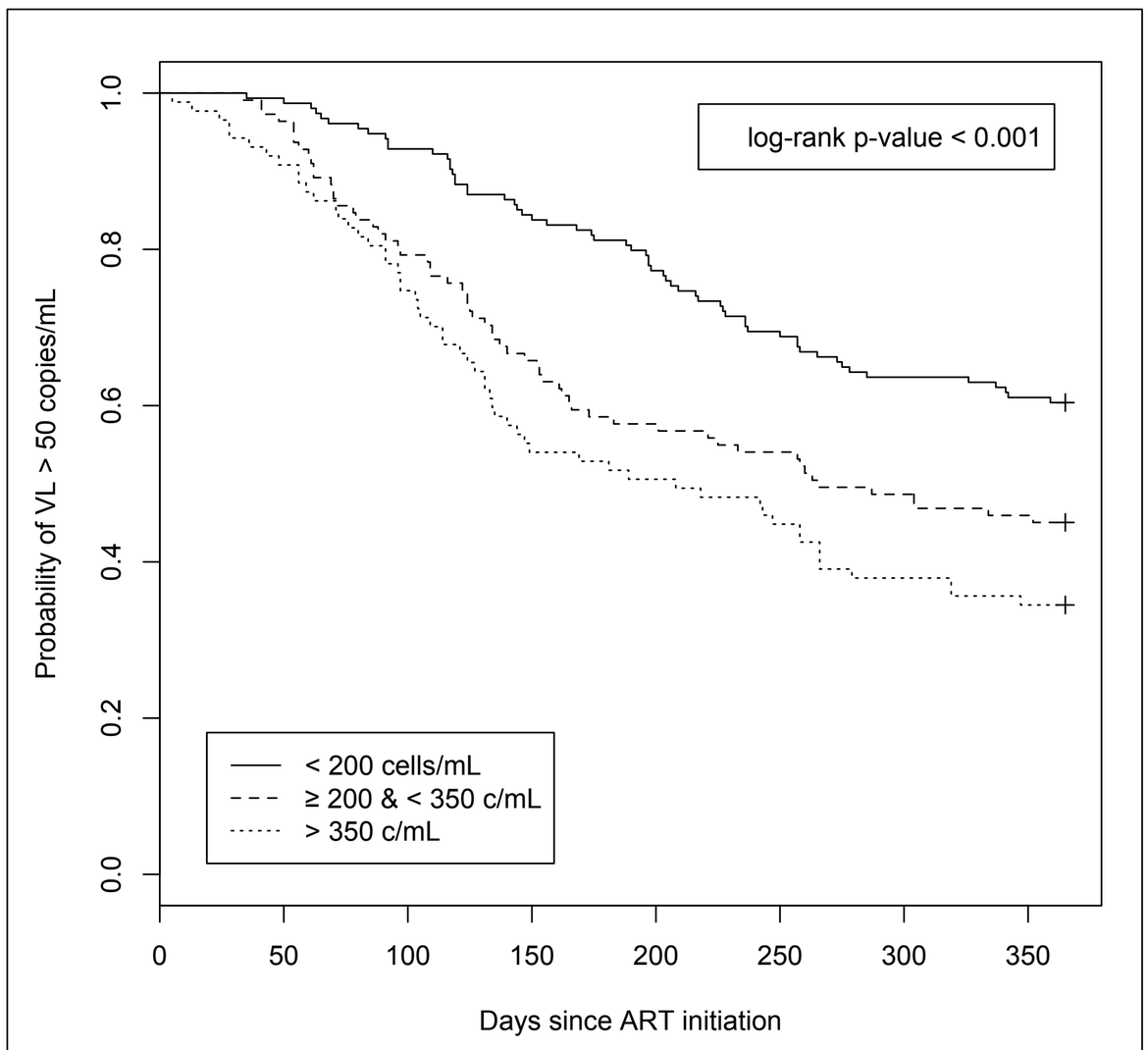


**Figure 2:** Time to plasma HIV-1 RNA viral load < 50 copies/mL in the 365 days following ART initiation stratified by CD4 cell count at initiation

## Discussion

- We observed that individuals were initiating ART earlier in the disease course in a community-based TasP ART scale-up initiative
- Our findings stand in contrast to earlier studies among HIV+ illicit drug users, who typically do not initiate treatment or do so at lower CD4 cell counts
- In contrast to concerns that earlier initiation would lead to poorer treatment outcomes, we found that individuals initiating at higher CD4 cell counts exhibited swifter rates of optimal virologic response
- Our findings support the continued scale-up of ART among PWUD in order to reach 90-90-90 targets to eliminate substantial HIV/AIDS associated morbidity, mortality and viral transmission among this vulnerable population

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