# REAL-WORLD UTILIZATION OF HIV PrEP MEDICATION IN A POPULATION-LEVEL PrEP PROGRAM IN BRITISH COLUMBIA, CANADA

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## BACKGROUND

- Publicly-funded and centrally distributed HIV Pre-Exposure Prophylaxis (PrEP) with emtricitabine-tenofovir has been available in British Columbia (BC) since 1-Jan-2018 through the BC Centre for Excellence in HIV/AIDS Drug Treatment Programs.
- We evaluated PrEP persistence and estimated medication utilization using longitudinal prescription data from BC's HIV PrEP program.

## METHODS

- Retrospective observational cohort study.
- BC PrEP participants with ≥1 dispensed PrEP prescription (Rx) between 1-Jan-2018 to 30-Jun-2022 were included, with follow-up until 30-Jun-2023.
- Demographic and clinical characteristics were described and participants grouped based on number of dispensed Rx (1 Rx, 2 Rx or ≥ 3 Rx). Groups were compared using Chi-square and Kruskal-Wallis Tests.
- For participants who persisted ≥3 Rx, PrEP utilization was estimated by calculating the proportion of days covered (PDC). Results were stratified by prescribed daily and on-demand PrEP use.

  ***PDC (%)*** = (total tabs dispensed that could have been taken between the first and terminal dispense date based on daily use / total days between the first and terminal dispense date within the study period*) x 100*

- Demographic and clinical variables with statistical and clinical significance were initially selected for multinomial logistic modelling. We present the adjusted odds ratio (aOR) for PrEP persistence ≥3 Rx vs. 1 Rx comparisons from the final selected multinomial model.

## RESULTS

### *Baseline characteristics*

- Of 9375 participants, the median (Q1-Q3) age was 32 (27-41) years, 97.0% were cisgender men, and 98.4% reported men who have sex with men (MSM)-based PrEP eligibility.
- 80.2% (7520/9375) had ≥3 Rx, 10.5% (986/9375) had 2 Rx, and 9.3% (869/9375) only had 1 Rx. Baseline demographics varied between dispensing groups (Table 1).

### *Results, continued*

**Table 1: BC PrEP participant characteristics by number of PrEP prescriptions dispensed (Rx)**

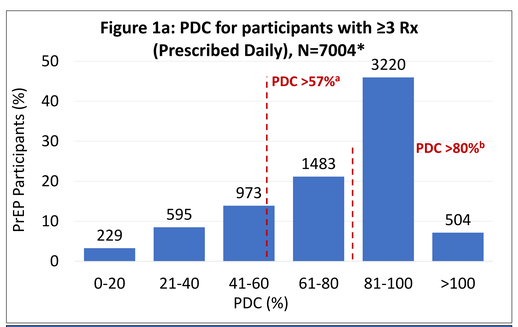
| | Overall (N=9375) | 1 Rx (N=869) | 2 Rx (N=986) | ≥3 Rx (N=7520) | p-value |
|---|---|---|---|---|---|
| **Age (years),** n (%) | | | | | <.0001 |
| ≤28 | 3157 (33.7) | 371 (42.7) | 421 (42.7) | 2365 (31.5) | |
| 29-40 | 3779 (40.3) | 299 (34.4) | 362 (36.7) | 3118 (41.5) | |
| 41-48 | 984 (10.5) | 71 (8.2) | 107 (10.9) | 806 (10.7) | |
| >48 | 1455 (15.5) | 128 (14.7) | 96 (9.7) | 1231 (16.4) | |
| **Gender identity**, n (%) | | | | | <.0001 |
| Cisgender men | 9097 (97.0) | 798 (91.8) | 946 (95.9) | 7353 (97.8) | |
| Cisgender women | 85 (0.9) | 29 (3.3) | 13 (1.3) | 43 (0.6) | |
| Transgender women | 121 (1.3) | 29 (3.3) | 19 (1.9) | 73 (1.0) | |
| Transgender men | 45 (0.5) | <10 (<1.2) | <10 (<1.0) | 30 (0.4) | |
| Other/unspecified | 27 (0.3) | <5 (<0.6) | <5 (<0.5) | 21 (0.3) | |
| **Client residence,** n (%) | | | | | <.0001 |
| Vancouver | 5133 (54.8) | 395 (45.5) | 473 (48.0) | 4265 (56.7) | |
| Greater Vancouver (except Vancouver) | 2338 (24.9) | 236 (27.2) | 261 (26.5) | 1841 (24.5) | |
| Outside Greater Vancouver | 1879 (20.0) | 230 (26.5) | 247 (25.1) | 1402 (18.6) | |
| Unknown | 25 (0.3) | 8 (0.9) | 5 (0.5) | 12 (0.2) | |
| **PrEP pick-up site,** n (%) | | | | | <.0001 |
| Central pharmacy | 7188 (76.7) | 584 (67.2) | 693 (70.3) | 5911 (78.6) | |
| Mail out | 2187 (23.3) | 285 (32.8) | 293 (29.7) | 1609 (21.4) | |
| **Prior PrEP use*,** n (%) | | | | | <.0001 |
| No | 7917 (84.4) | 762 (87.7) | 854 (86.6) | 6301 (83.8) | |
| Yes | 1234 (13.2) | 75 (8.6) | 100 (10.1) | 1059 (14.1) | |
| Unknown | 224 (2.4) | 32 (3.7) | 32 (3.2) | 160 (2.1) | |
| **HIV acquisition risk**, n (%) | | | | | <.0001 |
| MSM | 9224 (98.4) | 829 (95.4) | 966 (98.0) | 7429 (98.8) | |
| Non-MSM (male sex) | 66 (0.7) | 11 (1.3) | 7 (0.7) | 48 (0.6) | |
| Non-MSM (female sex) | 85 (0.9) | 29 (3.3) | 13 (1.3) | 43 (0.6) | |
| **HIRI-MSM score,** n (%) | | | | | <.0001 |
| 10-24 | 7124 (76.0) | 667 (76.8) | 750 (76.1) | 5707 (75.9) | |
| ≥25 | 1753 (18.7) | 130 (15.0) | 178 (18.1) | 1445 (19.2) | |
| Not applicable | 498 (5.3) | 72 (8.3) | 58 (5.9) | 368 (4.9) | |
| **Prescribed on-demand PrEP**,** n (%) | | | | | <.0001 |
| No | 8807 (93.9) | 852 (98.0) | 950 (96.3) | 7005 (93.2) | |
| Yes | 568 (6.1) | 17 (2.0) | 36 (3.7) | 515 (6.8) | |

*PrEP use prior to BC HIV PrEP program enrolment. **Ever formally prescribed on-demand PrEP. Some variable cells have been masked for privacy reasons. P-values compare the 3 dispensing groups. Study follow-up until 30-Jun-2023. Abbreviations: HIRI-MSM, HIV incidence risk index score for men who have sex with men.

### *Proportion of days covered (PDC) by PrEP medication for participants with ≥3 Rx*

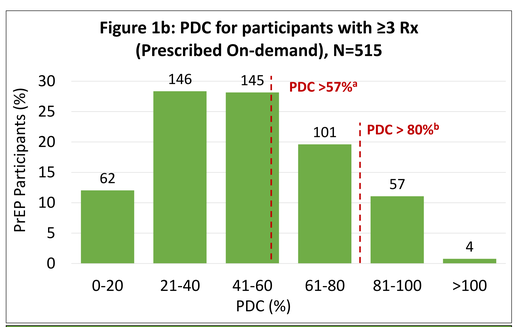
- The median (Q1-Q3) overall PDC was 81% (56-94%), with a median PDC follow-up time of 32 (15-50) months. PDC by prescribed use is shown in Figures 1a and 1b below.

**Figure 1a: PDC for participants with ≥3 Rx (Prescribed Daily), N=7004***




| PDC Characteristics for PrEP participants prescribed daily PrEP | |
|---|---|
| Median PDC (Q1-Q3), % | 83 (60-95) |
| Median PDC follow-up time (Q1-Q3), months | 30 (15-50) |

**Figure 1b: PDC for participants with ≥3 Rx (Prescribed On-demand), N=515**




| PDC Characteristics for PrEP participants prescribed on-demand PrEP | |
|---|---|
| Median PDC (Q1-Q3), % | 49 (30-67) |
| Median PDC follow-up time (Q1-Q3), months | 42 (21-54) |

*One participant with multiple Rx quantities <30 was excluded from PDC calculation. PDC follow-up time is based on the total days between the first and terminal dispense date during the study period. [a] Estimated threshold based on drug concentrations correlated with high PrEP protection, suggesting use of ≥ 4 tablets per week (≥ 57%) over long periods (Grant RM et al. The Lancet Infectious Diseases. 2014;14(9):820–9). [b] PDC >80% chosen as discretionary threshold for higher level of adherence (Marcus JL et al. J Acquire Immune Defic Syndr. 2016; 73:540-546).

### *Univariate and multivariate results for ≥3 Rx vs. 1 Rx*

**Table 2: Associations between demographic and clinical characteristics and PrEP persistence of ≥3 Rx vs. 1 Rx**

| | OR (95% CI) | aOR‡ (95%CI) |
|---|---|---|
| **Age (years)** | | |
| ≤28 | 0.66 (0.54, 0.82) | **0.67 (0.53, 0.83)** |
| 29-40 | 1.08 (0.87, 1.35) | 1.09 (0.87, 1.37) |
| 41-48 | 1.18 (0.87, 1.60) | 1.17 (0.86, 1.60) |
| >48 | 1.00 | 1.00 |
| **Gender identity** | | |
| Cisgender men | 1.00 | 1.00 |
| Cisgender women | 0.16 (0.10, 0.26) | **0.22 (0.12, 0.40)** |
| Transgender women | 0.27 (0.18, 0.42) | **0.30 (0.19, 0.46)** |
| Transgender men | 0.36 (0.17, 0.76) | **0.41 (0.19, 0.86)** |
| **Client residence** | | |
| Vancouver | 1.00 | - |
| Greater Vancouver (except Van.) | 0.72 (0.61, 0.86) | - |
| Outside Greater Vancouver | 0.56 (0.47, 0.67) | - |
| **PrEP pick-up site** | | |
| Central pharmacy | 1.00 | 1.00 |
| Mail out | 0.56 (0.48, 0.65) | **0.64 (0.54, 0.75)** |
| **Prior PrEP use*** | | |
| Yes | 1.00 | 1.00 |
| No | 0.59 (0.46, 0.75) | **0.72 (0.56, 0.92)** |
| **HIV acquisition risk**** | | |
| MSM | 1.00 | - |
| Non-MSM | 0.25 (0.17, 0.37) | - |
| **HIRI-MSM score** | | |
| 10-24 | 1.00 | 1.00 |
| ≥ 25 | 1.30 (1.07, 1.58) | **1.41 (1.15, 1.73)** |
| Not applicable | 0.60 (0.46, 0.78) | 0.90 (0.63, 1.28) |
| **Prescribed on-demand PrEP***** | | |
| Yes | 3.69 (2.26, 6.00) | **3.30 (1.99, 5.47)** |
| No | 1.00 | 1.00 |

‡ Adjusted for other variables with values in the column. *PrEP use before BC PrEP program enrolment. **Non-MSM categories were collapsed to one group. *** Ever formally prescribed. Other/unspecified gender identity and unknown client residence were not included in the analysis. Additional univariate analysis results not shown include: Other HIV acquisition risks (persons who inject drugs, heterosexual). Abbreviations: OR, Odds ratio; aOR, adjusted odds ratio; HIRI-MSM, HIV incidence risk index score for men who have sex with men.

- Multivariate analysis results showed decreased PrEP persistence was associated with younger age, non-cisgender men, mailing from the central pharmacy to another pick-up site, and no prior PrEP use (Table 2).
- Increased PrEP persistence was associated with having a greater HIRI-MSM score and being formally prescribed on-demand PrEP.

## CONCLUSIONS

- In this population-level program, >80% of participants demonstrated PrEP persistence with ≥3 Rx.
- Support may be warranted for younger persons, non-cisgender men, those with PrEP mailed from the central pharmacy, and participants starting PrEP.
- Overall estimates of PrEP medication utilization suggest non-daily, or interruptions in use, in those prescribed daily PrEP.

**BC Centre for Excellence in HIV/AIDS** www.bccfe.ca/hiv-pre-exposure-prophylaxis-prep

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