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SYPHILIS SCREENING AND INCIDENT INFECTION RATES IN HIV TREATMENT AND HIV PREP PROGRAMS IN BC, CANADA

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BACKGROUND

- In Canada, an increase in syphilis rates is affecting diverse populations, including heterosexual persons and youth.
- Gay, bisexual and other men who have sex with men (gbMSM) continue to be affected by high syphilis rates.
- We characterize syphilis testing and incidence rates amongst clients of the British Columbia (BC) HIV Pre-Exposure Prophylaxis (PrEP) and HIV Treatment (HIV Tx) Programs.

METHODS

- Adults aged ≥18 years old enrolled in the BC HIV PrEP and HIV Tx programs with program contact (i.e., lab test, drug dispensed) between 1-Jan-2018 to 31-Dec-2022 were included and followed to 30-Sep-2023.
- Client demographics, estimated syphilis testing rates (number of syphilis tests per person-year [PY]) and incidence rates (cases per 100 PY) in those with ≥1 test using a reverse-sequence algorithm with treponemal EIA during the study period, were described overall, by subgroup, and stratified by program: PrEP, HIV Tx, and PrEP/HIV Tx (the latter including clients switching from PrEP to HIV Tx after HIV acquisition).
- We compared client demographics between programs using Chi-square or Fisher Test for categorical variables and Wilcoxon-Mann-Whitney test for continuous variables. Poisson model with an offset was used for syphilis testing and incidence rate comparisons. Within program comparisons were made for clients with and without incident syphilis.

RESULTS

Demographics

- A total of 20030 clients were included [median (Q1-Q3) age 44 (33-58) years, 72.5% residing in Greater Vancouver area, 89.5% cis-men] and were comprised of 52.0% PrEP, 47.7% HIV Tx, and 0.3% PrEP/HIV Tx clients (Table 1).

Syphilis Testing and Incidence

- Overall, 18940 (94.6%) clients had ≥1 syphilis test.
- 2268/18940 (12.0%) had incident syphilis infection of whom ≥95% were cis-men. Of 2268 clients, 494 (21.8%) had more than one incident case of syphilis.
- The median (Q1-Q3) baseline age of clients with incident syphilis was 42 (34-52) years in HIV Tx and 33 (27-41) years in PrEP; p<0.001.

Results, continued

Figure: Quarterly Syphilis Incidence Rates by HIV Treatment (HIV Tx) and HIV PrEP Programs (2018-2023)

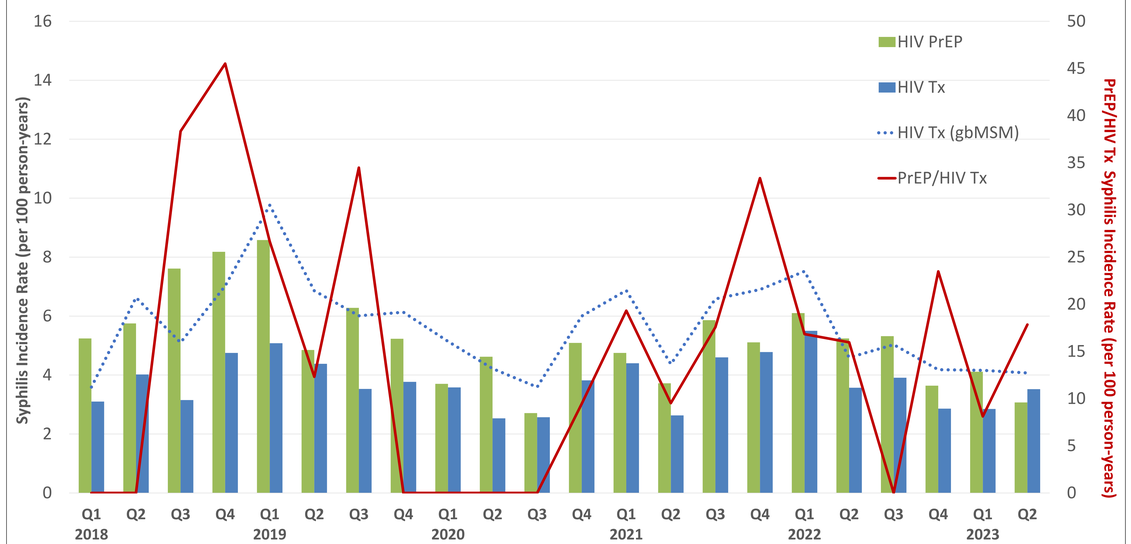

Table 1: Demographics and Overall Syphilis Testing and Incidence Rates for BC's HIV Tx and HIV PrEP Program Clients with ≥ 1 Test (1-Jan-2018 to 31-Dec-2022, follow-up until 30-Sep-2023)

		HIV PrEP			HIV Tx				HIV PrEP/HIV Tx		
	N (%)*	n (%)	Testing per PY	Incidence per 100PY	n (%)	Testing per PY	Incidence per 100PY	P-value **	n (%)	Testing per PY	Incidence per 100PY
Overall	20030 (100)	10421 (100)	≥1 test (n=10239, 98.3%)		9554 (100)	≥1 test (n=8646, 90.5%)			55 (100)	≥1 test (n=55, 100%)	
			3.50	5.09		2.82	3.79	<0.001		3.25	15.21
Gender Identity											
Cis-men	17935 (89.5)	10062 (96.6)	3.50	5.13	7818 (81.8)	2.96	4.27	<0.001	55 (100)	3.25	15.21
Cis-women	1749 (8.7)	96 (0.9)	3.21	3.94	1653 (17.3)	1.99	0.92	<0.001	-	-	-
Trans-men	63 (0.3)	56 (0.5)	3.08	2.31	7 (<0.1)	2.43	0.00	-	-	-	-
Trans-women	219 (1.1)	146 (1.4)	3.41	3.91	73 (0.8)	2.54	3.90	0.991	-	-	-
Other	54 (0.3)	<53 (<0.5)	3.70	4.00	<5 (<0.1)	3.65	15.22	0.232	-	-	-
Unknown	10 (0.1)	<9 (<0.1)	5.63	0.00	<5 (<0.1)	0.00	0.00	-	-	-	-
Age											
<30	4885 (24.4)	4090 (39.2)	3.44	5.07	768 (8.0)	3.05	8.47	<0.001	27 (49.1)	3.29	13.91
30-39	5104 (25.5)	3464 (33.2)	3.61	5.40	1620 (17.0)	2.87	7.23	<0.001	20 (36.4)	3.39	16.97
40-49	3665 (18.3)	1393 (13.4)	3.49	5.24	<2271 (<24.0)	2.66	3.93	0.001	<10 (<20.0)	2.40	20.68
50-59	4086 (20.4)	1044 (10.0)	3.43	4.29	<3041 (<32.0)	2.77	2.44	<0.001	<5 (<10.0)	4.12	0.00
60-69	1775 (8.9)	338 (3.2)	3.37	4.18	1437 (15.1)	2.95	1.57	<0.001	-	-	-
70+	515 (2.6)	92 (0.9)	3.11	5.50	423 (4.4)	3.07	1.06	<0.001	-	-	-

*Overall totals (N, %) includes clients with and without syphilis testing. **p-values for incidence rates compare between HIV PrEP and HIV Tx groups only (excludes PrEP/HIV Tx group). Rate calculations include only clients with ≥ 1 test. Abbreviations: HIV Tx, HIV Treatment; PY, Person-years. Some variable cells have been masked for privacy reasons.

- For clients aged under 40, overall incident syphilis rates were higher in HIV Tx than in PrEP; however, for clients over 40 years of age, syphilis incidence rates in HIV Tx were lower than in PrEP clients (Table 1).
- Overall testing and incidence rates were higher in PrEP than HIV Tx (p<0.001). However, known gbMSM in HIV Tx had higher incident syphilis rate than the PrEP program overall (5.57 vs. 5.09 per 100PY; p=0.041), but a lower testing rate (3.23 vs 3.50 per PY; p<0.001). See Tables 1 and 3. Quarterly incidence rates over time are illustrated in the figure.

Table 2: Syphilis Testing and Incidence Rates in BC's HIV PrEP Program by PrEP Eligibility Criteria (1-Jan-2018 to 31-Dec-2022, follow-up to 30-Sep-2023)

HIV PrEP Eligibility Criteria*	N (%)**	Testing (per PY)	Incidence (per 100PY)
Total	10421 (100)	≥ 1 test (n=10239, 98.3%)	
HIRI-MSM ≥ 10	7560 (72.5)	3.46	3.84
HIRI-MSM ≥ 10 and ≥1 other PrEP eligibility criteria	2244 (21.5)	3.61	8.40
Rectal bacterial STI or syphilis	205 (2.0)	3.69	10.66
Other gbMSM risk	124 (1.2)	3.26	5.23
Other non-gbMSM risk	158 (1.5)	3.27	2.76
Unknown	130 (1.2)	3.45	6.66

*PrEP program eligibility reported at enrolment.**Includes all PrEP clients with and without syphilis testing. Rates reported for those with ≥ 1 syphilis test only. Abbreviations: HIRI-MSM, HIV incidence risk index for men who have sex with men; STI, sexually transmitted infection; gbMSM, gay, bisexual, and other men who have sex with men.

Table 3: Syphilis Testing and Incidence Rates in BC's HIV Tx by HIV Acquisition Risk (1-Jan-2018 to 31-Dec-2022, follow-up to 30-Sep-2023)

HIV Acquisition risk*	N (%)**	Testing (per PY)	Incidence (per 100PY)
Total	9554 (100)	≥ 1 test (n=8646, 90.5%)	
gbMSM	3416 (35.8)	3.23	5.57
PWID	1821 (19.1)	2.12	1.16
gbMSM and PWID	583 (6.1)	2.91	3.85
Heterosexual	1128 (11.8)	2.41	1.34
Other risk	75 (0.8)	2.53	2.15
Unknown	2531 (26.5)	2.82	3.99

*Reason for HIV acquisition reported at HIV Tx program enrolment.**Includes all HIV Tx clients with and without syphilis testing. HIV risk not systematically captured by program prior to 2014. Abbreviations: gbMSM, gay, bisexual, and other men who have sex with men; PWID, persons who inject drugs.

- In PrEP, high incident syphilis rate was observed in clients who were eligible for the program based on reported history of bacterial rectal sexually transmitted infection (STI) or syphilis in the previous year, with baseline HIRI-MSM score ≥10 plus ≥1 other PrEP eligibility criteria (Table 2).
- High syphilis rate was also observed amongst PrEP clients with baseline HIRI-MSM score ≥25 (8.01 per 100PY), and in PrEP clients who subsequently acquired HIV (15.21 per 100PY).
- Across programs, 84.2% (n=1473/1749) of cis-women had ≥1 syphilis test. Testing and incidence rates were 2.03 per PY and 1.02 per 100PY, respectively.

CONCLUSIONS

- Elevated syphilis rates were observed in the PrEP program overall, as well as in persons living with HIV who were gbMSM and younger.
- Incident syphilis diagnosis among PrEP users should prompt testing for other STIs and provides an opportunity for assessment of HIV PrEP medication adherence.
- These findings have informed public health intervention planning, including doxycycline for the prevention of bacterial STIs.

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British Columbia Centre for Excellence in HIV/AIDS: www.bccfe.ca/drug-treatment-program