Newly HIV-Infected Gay, Bisexual and other Men Who Have Sex With Men (MSM) in Vancouver, British Columbia: Preliminary Findings of the Momentum Health Study

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Background

- In Canada, gay and other men who have sex with men (MSM) have an incidence rate 71 times greater than non-MSM (PHAC, 2014)
- In British Columbia, the number of new HIV diagnoses among MSM has remained relatively stable for the past decade (~140-180 / year)
- **We measured HIV incidence among participants in a prospective cohort of MSM in Vancouver, British Columbia and explored characteristics associated with HIV seroconversion.**

Methods

Study Protocol & Participants: The Momentum Health Study is a prospective longitudinal bio-behavioural study of gay and other MSM aged 16+ in Metro Vancouver recruited using respondent-driven sampling from February 2012 to February 2015.

Data: Participants complete in-person study visits every 6 months that last ~90 minutes and include a computer-assisted self-interview (CASI) on demographics, sexual behaviour, substance use, and psychosocial attributes, and a subsequent nurse visit with rapid point-of-care HIV testing and for biological specimen collection for HIV and syphilis serology.

Outcome: Seroconvertors were participants who tested HIV-negative at baseline and HIV-positive at a subsequent study visit or another testing source between visits. Participants report their data of HIV diagnosis, which was used to calculate a prospective HIV incidence rate. We also examine participants who self-reported being HIV-negative at baseline, but tested HIV-positive during the clinical portion of their study visit. A retrospective HIV incidence is calculated using the date of their last reported HIV-negative test result.

Explanatory Variables: Behavioural data are drawn from their most recently completed questionnaire prior to HIV diagnosis, or their last completed questionnaire for participants who remained HIV-negative. Explanatory factors include demographics, sexual behaviour, STI testing and diagnosis history, substance use, and various psychosocial scales:

- *HAART Optimism* (Van de Ven et al., 2000; study α=0.82)
- *Sexual Sensation Seeking* (Kalichman & Rompa, 1995; study α=0.82)
- *Cognitive Escape* (McKirnan et al., 2001; study α=0.88)
- *Sexual Altruism – Personal and Communal subscales* (Nimmons & Folkman, 1999; study α=0.83 & 0.89, respectively)
- *Self Esteem* (Herek & Glunt, 1995; study α=0.91)
- *Hospital Anxiety and Depression subscales* (Zigmond & Snaith, 1983; study α=0.85 & 0.81, respectively).

Statistical Analysis: Incidence rates were calculated both retrospectively and prospectively. The prospective estimates were further stratified by age (<30 years versus older). Descriptive statistics and univariate associations were prepared to compare HIV seroconvertors and those who remained HIV-negative using Poisson regression ($p<0.05$ was considered significant) with adjustments with different lengths of follow-up time. Incidence rate ratios are presented with 95% confidence intervals.

Results (Incidence Rate)

- As of May 30th, 2015, 406 MSM who tested HIV-negative at baseline contributed 664 person-years of follow-up (mean=1.63 years/person).
- At baseline, 3 participants were diagnosed (of 518 with recent test data) that had self-identified as HIV-negative prior. The retrospective incidence rate was 0.58 per 100 person-years (95% CI: 0.19-1.78).
- During follow-up, 6 participants seroconverted. **The prospective incidence rate was 0.90 per 100 person-years** (95% CI: 0.41-2.01).
- The HIV incidence for younger MSM (aged <30 years) was 1.80 per 100 person-years (95% CI: 0.75-4.32) and was marginally statistically higher than older MSM (p=0.077; RR=6.92, 95% CI: 0.81-58.94)

Results (Seroconversion Factors)

- Table 1 shows descriptive statistics of seroconvertors (n=6) compared with those who remain HIV-negative (n=400), including a p-value and univariable measure of association (if possible). **Bold** factors are statistically significant.

TABLE 1. Selected descriptive statistics and univariable associations

	Seroconvertors (n=6)		HIV-Negative (n=400)		RR	95% CI		p
	n	%	n	%				
Aged <30 years (vs. older)	5	83.3	175	43.8	6.92	0.81	58.9	0.08
Gay-identified (vs. not)	6	100.0	332	83.0	--	--	--	0.60
Caucasian (vs. not)	5	83.3	295	73.8	1.61	0.19	13.7	0.66
Born in Canada (vs. not)	3	50.0	307	76.8	0.27	0.06	1.35	0.11
Has Regular Partner (vs. single)	3	50.0	193	48.3	1.09	0.22	5.40	0.92
Anal Sexual Position: Bottom	4	66.7	131	32.8	--	--	--	0.56
Circumcised (vs. not)	3	50.0	219	57.6	0.69	0.14	3.43	0.65
Self-identified as high risk for HIV	**3**	**50.0**	**29**	**7.3**	**12.6**	**2.53**	**62.4**	**<0.01**
Any CAI* with HIV-positive partner	**3**	**50.0**	**44**	**11.1**	**7.57**	**1.53**	**37.4**	**0.01**
Any CAI* with status unknown partner	3	50.0	176	44.2	1.23	0.25	6.12	0.80
Attended group sex event, P6M	**3**	**50.0**	**52**	**13.0**	**6.76**	**1.36**	**33.6**	**0.02**
Crystal methamphetamine use, P6M	**2**	**33.3**	**26**	**6.5**	**8.17**	**1.49**	**44.7**	**0.02**
STI tested, lifetime	4	66.7	117	29.5	4.79	0.88	26.1	0.07
STI diagnosed, lifetime	1	16.7	29	7.3	3.51	0.40	30.8	0.26
	median	Q1,Q3	median	Q1,Q3	RR	95% CI		p
Total # male anal sex partners, P6M	**11**	**4, 35**	**2**	**1, 4**	**1.02**	**1.01**	**1.03**	**<0.001**
Condom use %, casual partners	62.5	25, 100	90	50, 100	0.99	0.97	1.01	0.36
Condom use %, regular partners	0	0, 50	0	0, 100	0.99	0.97	1.02	0.66
Sexual event-level data:								
# of partners (maximum of 5)	**5**	**5, 5**	**3**	**1, 5**	**3.99**	**1.40**	**11.3**	**<0.01**
# of older partners (maximum of 5)	**3**	**1, 4**	**1**	**0, 2**	**1.90**	**1.21**	**2.99**	**<0.01**
# of CAI events (maximum of 5)	**3**	**2, 5**	**1**	**0, 1**	**2.39**	**1.40**	**4.10**	**<0.01**
# of anal sex events (no maximum)	**43.5**	**15, 83**	**7**	**2, 19.5**	**1.02**	**1.01**	**1.03**	**<0.001**
HAART Optimism	32	28, 33	26	23, 29	1.15	0.99	1.33	0.07
Sexual Sensation Seeking	**34.5**	**33, 36**	**31**	**28, 33**	**1.25**	**1.09**	**1.42**	**<0.01**
Cognitive Escape	25	23, 30	28	24, 32	0.97	0.84	1.11	0.65
Sexual Altruism - Personal	32	26, 34	32	28, 35	0.95	0.73	1.22	0.66
Sexual Altruism - Communal	**19**	**18, 28**	**27**	**24, 30**	**0.85**	**0.73**	**0.99**	**0.04**
Self Esteem	7	3, 11	7	3, 9	1.02	0.84	1.24	0.85
HADS - Anxiety	5	4, 15	7	4, 11	1.04	0.83	1.30	0.74
HADS - Depression	3	1, 5	3	1, 6	0.95	0.75	1.20	0.68

NB: **Bolded** text indicates p<0.05; RR=incidence rate ratio; *CAI=condomless anal intercourse; P6M=past 6 months

Conclusions

- 5 of 6 recent HIV seroconvertors in our study were aged <30, which differs from provincial surveillance reports, where approximately 30% of new diagnoses among MSM in 2013 were in this age range.
- Men who seroconverted reported frequent partner change, greater sensation seeking, and greater rates of anal intercourse who appeared to understand that they were at higher risk for HIV acquisition.
- These men were more likely to attend group sex events, have used crystal methamphetamine, report a greater number of older sexual partners, and report condomless anal intercourse with an HIV-positive partner.
- HIV prevention programs should further target such individuals.

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