Undetectable or Unknown? Longitudinal Sexual Event-Level Analysis Among Gay, Bisexual and Other Men Who Have Sex With Men (GBM) in Metro Vancouver

Nathan J Lachowsky (1,2), Terry Howard (3,4), Everett Blackwell (3), Lu Wang (2), Nicanor Bacani (2), Heather L. Armstrong (2,5), Gbolahan Olarewaju (2), Richard Crosby (6), Eric Roth (1), Robert S. Hogg (2,7), David M. Moore (2,5)

1. University of Victoria, Victoria, Canada; 2. BC Centre for Excellence in HIV/AIDS, Vancouver, British Columbia; 3. Momentum Health Study Community Advisory Board; 4. GlassHouse Consultants, Vancouver, Canada
5. Faculty of Medicine, University of British Columbia, Vancouver, Canada; 6. University of Kentucky, Lexington, KY, United States of America; 7. Simon Fraser University, Burnaby, Canada

Background

- *HPTN 052* and *PARTNER* study findings catalyzed community activism on "undetectable=untransmittable" (U=U)
- We examined temporal trends and factors associated with undetectable HIV status sexual partners among gay and bisexual men (GBM) in Vancouver

Methods

- **Prospective cohort data** were collected from **09/2014-02/2017** from sexually-active Metro Vancouver GBM (inclusive of trans men) aged ≥16 years
- Participants were recruited using **respondent-driven sampling (RDS)**
- Participants completed study visits every six months, including a computer questionnaire (self-complete) providing <u>event-level data</u> on their last sexual encounter with their five most recent partners
- Stratified by HIV status, we used **four-level mixed effects models** (RDS recruitment chain; participant; visit; event) to:
  1. evaluate temporal trends (6-month periods)
  2. identify factors associated with partner's HIV status
- We built multivariable models to **compare events where partners were reported as "undetectable" versus unknown HIV status** using backward selection with AIC minimization.

Results

- 481 participants, completed 1303 visits reporting on 3786 sexual events (29.7% from self-reported HIV-positive GBM)
- Temporal trends are shown in **Figure 1**. There were no temporal trends in reporting an undetectable partner for HIV-negative GBM (mean=5.0%, p=0.14) or HIV-positive GBM (mean=14.5%, p=0.71).
- Multivariable models of factors associated with undetectable versus unknown HIV status partners are shown in **Table 1**.
- Regardless of participant's HIV status, their undetectable partners were older and from longer sexual relationships.
- Condomless anal sex (insertive and receptive) was more likely with undetectable partners.
- HIV treatment optimism was not associated for HIV-positive GBM (p=0.35) nor selected in final model for HIV-negative GBM (OR=1.12, 95%CI:1.06-1.19).

Conclusion

- Although **frequency of undetectable partners has not increased over time**, these partners were older, with longer relationships, and used condoms less.
- **These sexual practices reflect community knowledge of U=U scientific consensus.**
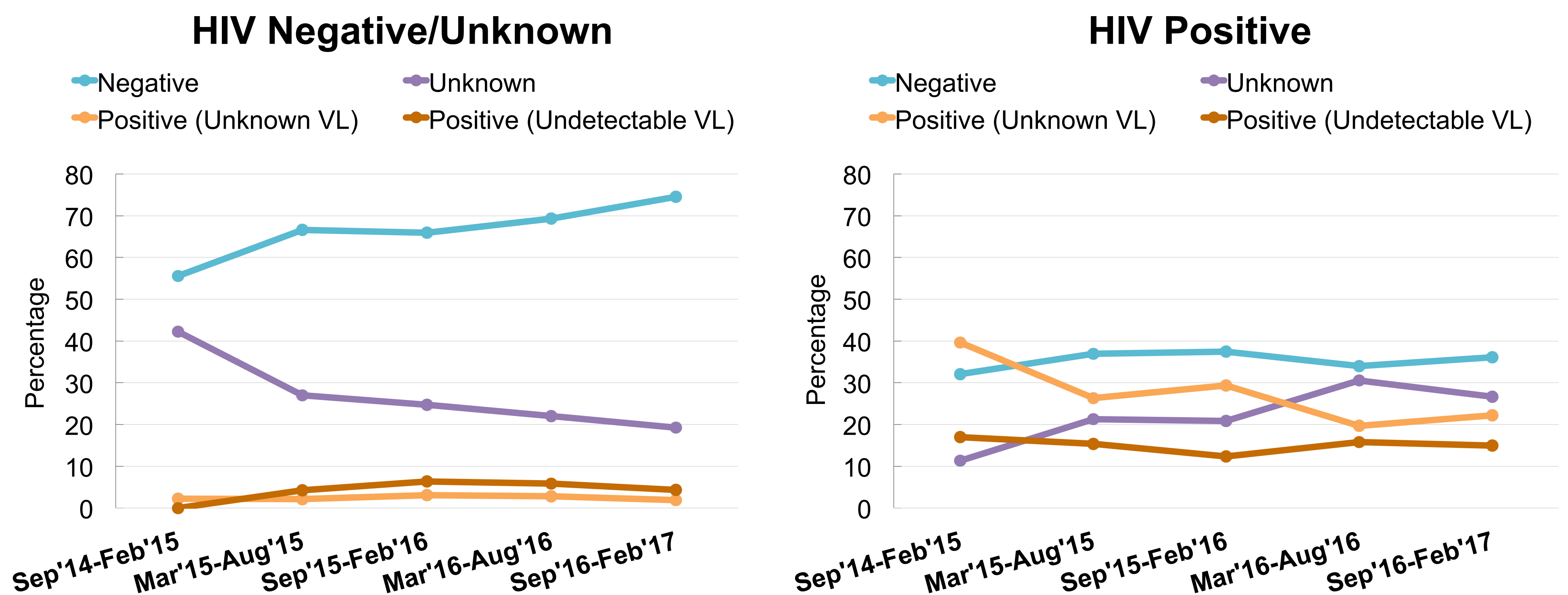
Figure 1: Temporal trends in partner's HIV status, stratified by participant HIV status (2014-2017)

Table 1: Multivariable models of factors associated with having a partner reported as "undetectable" versus unknown HIV status among HIV-negative and HIV-positive Metro Vancouver GBM

INDIVIDUAL-LEVEL FACTORS	HIV-Negative aOR	HIV-Negative 95% CI		HIV-Positive aOR	HIV-Positive 95% CI	
Ethnicity						
White	1.00					
Asian	**0.09**	**0.02**	**0.52**			
Aboriginal	0.07	0.00	61.52			
Latin American/Other	0.47	0.19	1.20			
Viral load sorting, past 6 months	**6.42**	**3.36**	**12.27**			
Escort/sex work, past 6 months	**0.05**	**0.01**	**0.29**	**0.04**	**0.01**	**0.29**
EVENT-LEVEL FACTORS	aOR	95% CI		aOR	95% CI	
Relative age of partner						
Much younger/younger than me	1.00			1.00		
About the same age as me	1.62	0.82	3.23	0.80	0.37	1.71
Much older/older than me	**2.97**	**1.42**	**6.21**	**2.42**	**1.05**	**5.58**
Condomless anal sex as bottom	**3.25**	**1.86**	**5.70**	**2.37**	**1.04**	**5.39**
Condomless anal sex as top	**6.12**	**3.49**	**10.74**	**5.81**	**2.94**	**11.48**
Gave blowjob				**0.37**	**0.18**	**0.77**
Rimming	1.92	0.98	3.75			
Shared sex toys	**9.94**	**2.64**	**37.50**	**6.79**	**1.18**	**38.97**
Event-Level Participant Marijuana Use				**0.27**	**0.08**	**0.95**
Event-Level Participant Crystal Meth Use	**5.92**	**1.87**	**18.75**			
Event-Level Participant GHB Use	**0.10**	**0.02**	**0.56**			
Event-Level Partner Alcohol Use	0.41	0.16	1.06			
Event-Level Partner Marijuana Use				**5.08**	**1.28**	**20.17**
Event-Level Partner GHB Use	**13.44**	**2.20**	**82.19**	**20.55**	**3.36**	**125.89**
Event-Level Partner Ecstasy Use				**8.89**	**2.30**	**34.27**
Months since first sex	1.01	1.00	1.03	1.01	1.00	1.01
Number of times of sex in past 6 months				**1.13**	**1.05**	**1.20**

aOR = adjusted odds ration, 95% CI = 95% confidence interval, GHB = gamma-hydroxybutyric acid

Conflict of Interest Disclosure: "I have no conflicts of interest"