VALIDATING SELF-REPORT OF UNDETECTABLE VIRAL LOAD AGAINST LABORATORY PLASMA VIRAL LOAD MEASURES IN A MULTI-SITE COHORT OF WOMEN LIVING WITH HIV IN BRITISH COLUMBIA

A Carter[1,2], P Sereda[2], A Nohpal[2], G Colley[2], K Proulx-Boucher[3], J Thomas-Pavanel[4], V Nicholson[1], K Beaver[4], R.S. Hogg[1,2], A. de Pokomandy[3,5], M. Loutfy[4,6], A. Kaida[2],
On Behalf of the CHIWOS Research Team

1. Faculty of Health Sciences, Simon Fraser University, Vancouver, BC; 2. BC Centre for Excellence in HIV/AIDS, Vancouver, BC; 3. Chronic Viral Illness Service, McGill University Health Centre, Montreal, QC; 4. Women's College Research Institute, Women's College Hospital, Toronto, ON; 5. Department of Family Medicine, McGill University, Montreal QC; 6. Faculty of Medicine, University of Toronto, Toronto, ON;

POSTER NO. EPH12

BACKGROUND

Treatment as Prevention (TasP) aims to reduce HIV burden by achieving viral suppression in people with HIV.

Laboratory technologies are the gold standard for measuring plasma viral load (VL) in clinical practice.

However, in the absence of laboratory data, observational studies rely on patients' self-report in questionnaires and the validity of this remains unclear.

Study objective: We assessed the validity of a self-reported measure of undetectable VL to assess viral suppression among women living with HIV (WLWH).

METHODS

The **Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS)** is a longitudinal community-based research study enrolling over 1,400 WLWH in BC, ON, and QC. Peer Research Associates (WLWH) administer a comprehensive, online questionnaire to participants at baseline and 18-months, collecting socio-demographic, behavioral, and clinical information including VL data. **In this analysis:**

Study Population: Baseline survey data were analyzed for participants enrolled between Aug 27, 2013 and Mar 13, 2015 in **BC**, where linkage to clinical data is possible through the Drug Treatment Program of the BC Centre for Excellence in HIV/AIDS (a population-based registry capturing 100% of VL data in BC).

Outcome: Self-reported undetectable VL was assessed by the survey question: "What was your most recent VL, undetectable (i.e. below 50 copies/mL) or detectable (i.e. over 50 copies/mL)?" Laboratory measurements of VL <50 copies/mL (closest to and before the study visit) were the criterion for validity analyses.

Statistical Analysis: We measured positive and negative predictive values (PPV, NPV) and likelihood ratios (LR+, LR–) of self-reported undetectable VL.

RESULTS

Of 340 participants, 99% were linked to BC-CfE clinical data. Those remaining unlinked (n=2), missing self-report VL (n=18), or both (n=1) were excluded. Of those included:

➢ 83% were currently on ARVs and 93% enrolled in HIV care in past year
➢ 85% self-reported having undetectable VL while 82% had laboratory data indicating suppression

Table 1. Participant Characteristics (n=319)

	n(%)
Age, median (IQR)	45 (IQR: 37-51)
Gender identity	
Women	311(97)
Trans woman/Two-spirited/Gender Queer/Other	8(3)
Ethnicity	
Aboriginal	143(45)
Caucasian	116(36)
African / Caribbean / Black Canadian	26(8)
Other	34(11)
Sexual orientation	
Heterosexual	262(82)
Lesbian/Gay/Queer/Two-spirited/Bisexual/Questioning	44(14)
Other	13(4)
>=High School Education (Yes)	252(79)
<$20,000 Annual Household Income (Yes)	201(76)
Incarcerated in past 12 months (Yes)	31(10)
Illicit drug use in past 3 months (Yes)	112(35)
Oak Tree Clinic (Yes)	125(49)

RESULTS (CONTINUED)

Table 2. Predictive values and likelihood ratios of self-reported undetectable VL

a. Overall

		Laboratory-confirmed (from BC-CfE)[1]		PPV (95% CI)	NPV (95% CI)	LR+ (SE)	LR- (SE)
		VL <50 copies/mL	VL >=50 copies/mL				
Self-report (from CHIWOS)	Undetectable (i.e. <50 copies/mL)	252	18	93.3(89.7-96)	77.6(63.4-88.2)	0.1991 (0.0636)	12.4264 (3.2312)
	Detectable (i.e. >50 copies/mL)	11	38				

1. Gold Standard (True diagnosis)

b. Stratified by population group

	PPV (95% CI)	NPV (95% CI)	LR+ (SE)	LR- (SE)
Ethnicity				
Aboriginal	93.1(86.86-96.98)	85.19(66.27-95.81)	0.1591(0.07354)	12.3519 (4.3288)
Caucasian	93 (86.11-97.14)	68.75(41.34-88.98)	0.336(0.1249)	9,8214 (3.9441)
African / Caribbean / Black Canadian	90.91 (70.84-98.88)	75 (19.41-99.37)	0.275 (0.2389)	8,25 (6.0505)
Other	96.88 (83.78-99.92)	50 (1.26-98.74)	0.5161 (0.3653)	16 (19.3905)
Education				
< High school	94.55 (84.88-98.86)	66.67(34.89-90.08)	0.3526 (0.1444)	12.2222 (7.3008)
>=High school	93.02 (88.75-96.04)	81.08 (64.84-92.04)	0.2034 (0.06932)	11.6216 (3.0377)
Illicit drug use in past 3 months				
Yes	90.36 (81.89-95.75)	79.31 (60.28-92.01)	0.229 (0.08365)	9.2285 (2.8735)
No	96.15 (91.25-98.74)	73.33 (44.9-92.21)	0.2773 (0.1188)	19.0067 (8.8726)
HIV Clinic				
Oak Tree Clinic	96.08 (90.26-98.92)	86.96 (66.41-97.22)	0.1258 (0.07314)	22.1739 (11.0138)
Non-Oak Tree Clinic	94.78 (88.99-98.06)	58.82 (32.92-81.56)	0.4344 (0.1263)	11.2745 (5.0313)

In Summary:
➢ PPV reveals that 93% of women who self-reported being undetectable truly were
➢ NPV reveals that 81% who reported being detectable truly were
➢ No significant differences observed by population groups, suggesting that our self-report measure is a valid method of assessment of undetectable VL among diverse WLWH (in settings where true prevalence of VL suppression is high)
➢ Interpreting LRs:
   ➢ LRs assess the value of our self-reported measure and how likely it is that a participant is suppressed or not.
   ➢ LRs are a ratio of the probability that the self-report is correct to the probability that the self-report is incorrect.
   ➢ **LR+** (=sensitivity/1-specificity) indicates how much more likely a person **with** suppression is to self-report undetectable (true positives), compared to a person **without** suppression (false positives). In other words, it expresses how much a report of undetectable **increases** the odds of being suppressed.
   ➢ **LR-** (=1-sensitivity/specificity) indicates how much more likely a person **with** suppression is to self-report detectable (false negatives), compared to a person without suppression (true negatives). In other words, it expresses how much a report of detectable **decreases** the odds being suppressed.
   ➢ **In this study:** The true rate of viral suppression is really high (82%). So, the additional information provided by a self-report of undetectable is not very much (**low LR+**) – e.g., no useful info for ruling suppression in or out has been produced from these findings. But the additional information of self-reporting detectable is a lot (**high LR-**) – e.g., if a participant reports being detectable, you can be fairly certain that she is *not* supressed.

CONCLUSIONS

A brief self-reported measure assessing undetectable VL strongly predicted true viral suppression among a cohort of women living with HIV in BC with a high prevalence of laboratory-confirmed viral suppression**.** Information provided by a self-report of detectable is much more informative to ruling in or out suppression. This measure can be used in research settings without laboratory data to assess TasP-related goals.

ACKNOWLEDGMENTS

Allison Carter (British Columbia):
allison_carter@sfu.ca

Jamie Thomas-Pavanel (Ontario):
Jamie.Thomas-Pavanel@wchospital.ca

Karène Proulx-Boucher (Quebec):
chiwos.quebec@gmail.com

CHIWOS
Étude sur la santé sexuelle et reproductive des femmes vivant avec le VIH au Canada
Canadian HIV Women's Sexual and Reproductive Health Cohort Study