

# Accuracy of PrEP adherence measures among adolescent men who have sex with men and transgender women in Brazil

D. Zeballos<sup>1</sup>, L. Magno<sup>2</sup>, F. Soares<sup>1</sup>, M. Eustorgio<sup>3</sup>, L. Amorim<sup>1</sup>, JÁ. Pinto Junior<sup>4</sup>, D. Greco<sup>5</sup>, A. Grangeiro<sup>6</sup>, I. Dourado<sup>1</sup> and The PrEP1519 Brazil Study Group

<sup>1</sup>Federal University of Bahia, Collective Health Institute, Salvador, Brazil, <sup>2</sup>State University of Bahia, Salvador, Brazil, <sup>3</sup>Federal University of Bahia, Institute of Mathematics and Statistics, Salvador, Brazil, <sup>4</sup>Universidade Federal Fluminense, Departamento de Estatística, Niterói, Rio de Janeiro, Brasil. <sup>5</sup>Universidade Federal de Minas Gerais, Faculdade de Medicina, Belo Horizonte, Brazil. <sup>6</sup>Universidade de São Paulo, Faculdade de Medicina Preventiva, São Paulo, Brazil

## Background

Adherence is fundamental to PrEP effectiveness. Direct measures of adherence are expensive and not sustainable in most PrEP services. Therefore, an indirect measure is a feasible alternative.

## Objective

The aim of this analysis was to assess the concordance of indirect measures for PrEP adherence comparing them with a direct measure.

## Methods

- PrEP1519 is a daily oral PrEP demonstration cohort study among adolescent men who have sex with men (aMSM) and transgender women (aTGW) aged 15-19 years.
- Indirect measures such as medication possession ratio (MPR), pill-count, and self-report were compared to tenofovir diphosphate (TFV-DP) concentrations in dried blood spot (DBS).
- Participants receiving pills of FTC/TDF, had DBS collected and stored at each study visit, were asked to return their PrEP bottles and to recall PrEP use in the last 30 days.
- A sample of DBS from aMSM, available DBS from all seroconverters, and all aTGW were sent for quantification of TFV-DP concentrations.
- The accuracy of each indirect measure was assessed using areas under (AUC) the receiver operating characteristics (ROC) curves for protective TFV-DP levels  $\geq 800$ fmol/punch equivalent to 4 doses per week or above.
- Sensitivity (SE), specificity (SP), and predictive values positive (PPV) and negative (NPV) were assessed for the best cutoff points identified by Youden index.

## Results

DBS data from 188 participants were included. Coincidental data for indirect measures were: MPR (N=185), pill-count (N= 68) and self-report (N= 174).

Table 1. Baseline characteristics of participants included in this analysis vs. not included by sub-population

Characteristics	Men who have sex with men				Transgender women			
	Total	Included	Not included	p value	Total	Included	Not included	p value
Age				0.650				0.756
15 - 17 years	121	26 (21.49)	95 (78.51)		16	11 (68.75)	5 (31.25)	
19 - 20 years	521	122 (23.42)	399 (76.58)		45	29 (64.44)	16 (35.56)	
Skin-color				0.904				0.581
White	184	43 (23.37)	141 (76.63)		11	8 (72.73)	3 (27.27)	
Non-White	458	105 (22.93)	353 (77.07)		50	32 (64.00)	18 (36.00)	
Study site				0.019				0.007
Belo Horizonte	151	53 (35.10)	98 (64.90)		28	14 (50.00)	14 (50.00)	
Salvador	213	64 (30.05)	149 (69.95)		20	13 (65.00)	7 (35.00)	
São Paulo	339	71 (20.94)	268 (79.06)		13	13 (100.00)	0 (0.00)	
Schooling				0.428				0.127
Higher education	183	39 (21.31)	144 (78.69)		5	5 (100.00)	0 (0.00)	
High school or less	441	107 (24.26)	334 (75.74)		52	35 (67.31)	17 (32.69)	
Housing				0.020				0.073
With Family	511	128 (25.05)	383 (74.95)		30	23 (76.67)	7 (23.33)	
Others	130	20 (15.38)	110 (84.62)		31	17 (54.84)	14 (45.16)	
Condomless anal sex				0.649				0.217
No	227	51 (22.47)	176 (77.53)		20	12 (60.00)	8 (40.00)	
Yes	403	97 (24.07)	306 (75.93)		37	28 (75.68)	9 (24.32)	
Partner living with HIV				0.144				0.097
No/Don't know	465	113 (24.30)	352 (75.70)		47	35 (74.47)	12 (25.53)	
Yes	37	13 (35.14)	24 (64.86)		1	0 (0.00)	1 (100.00)	

Table 2. Association between indirect adherence measures and protective drug levels

Adherence measure	AUC (95%CI)	Cutoff point	SE	SP	PPV	NPV
MPR	0.55 (0.47 – 0.53)	0.90	80.3%	40.4%	25.4%	51.6%
Pill count	0.67 (0.54 – 0.80)	92.7	72.7%	62.9%	29.0%	35.1%
Self-report	0.72 (0.65 – 0.80)	83.33	91.8%	46.5%	11.3%	44.6%

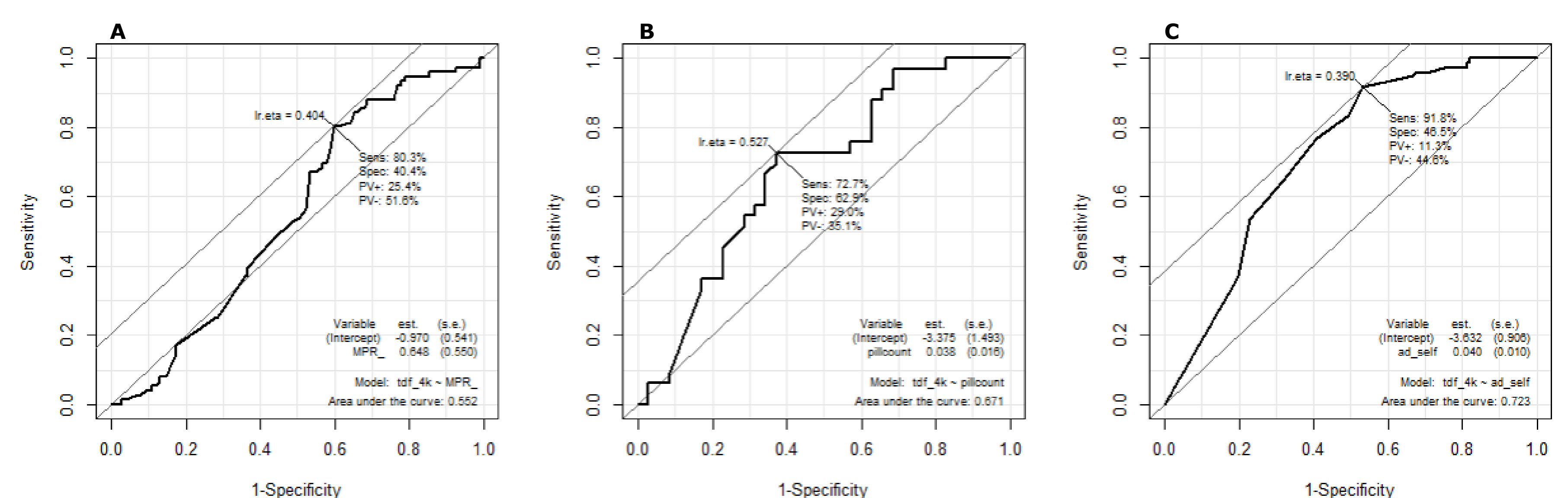


Figure 2. ROC curve for indirect measures of adherence A) MPR, B) pill count and C) Self-report considering first DBS per participant

## Conclusions

Pill count and self-report were able to discriminate adolescents with protective levels of TFV-DP. In addition, self-report adherence showed the best performance, and it is feasible and sustainable to be implemented in PrEP services for adolescents.

## Acknowledgements

The authors would like to express their gratitude to the study participants, the local teams that carried out the fieldwork in the three cities, and all collaborators. We are also grateful for the support of the Brazilian National Council for Scientific and Technological Development (CNPq) for the Doctoral Fellowship to Diana Zeballos.