

## BACKGROUND

- Cross-sectional studies have shown association between receptive anal sex and active syphilis among men who have sex with men (MSM) and transgender women (TW) (1,2).
- We evaluate the relationship between role in anal sex and incident syphilis in a cohort of MSM/TW in Lima, Peru.

## METHODS

- We recruited participants from two STI clinics (Epicentro and Barton).
- In quarterly follow-up visits, participants provide behavioral data, and serologic testing is performed for HIV and syphilis.
- Participants’ roles in anal sex reported at baseline were categorized as insertive, receptive or versatile.
- Participants with active syphilis (i.e. RPR titer  $\geq 1/16$  and TPPA  $\geq 1:80$ ) were treated according to CDC guidelines.
- The multivariable logistic regression model using generalized estimating equations for longitudinal data.

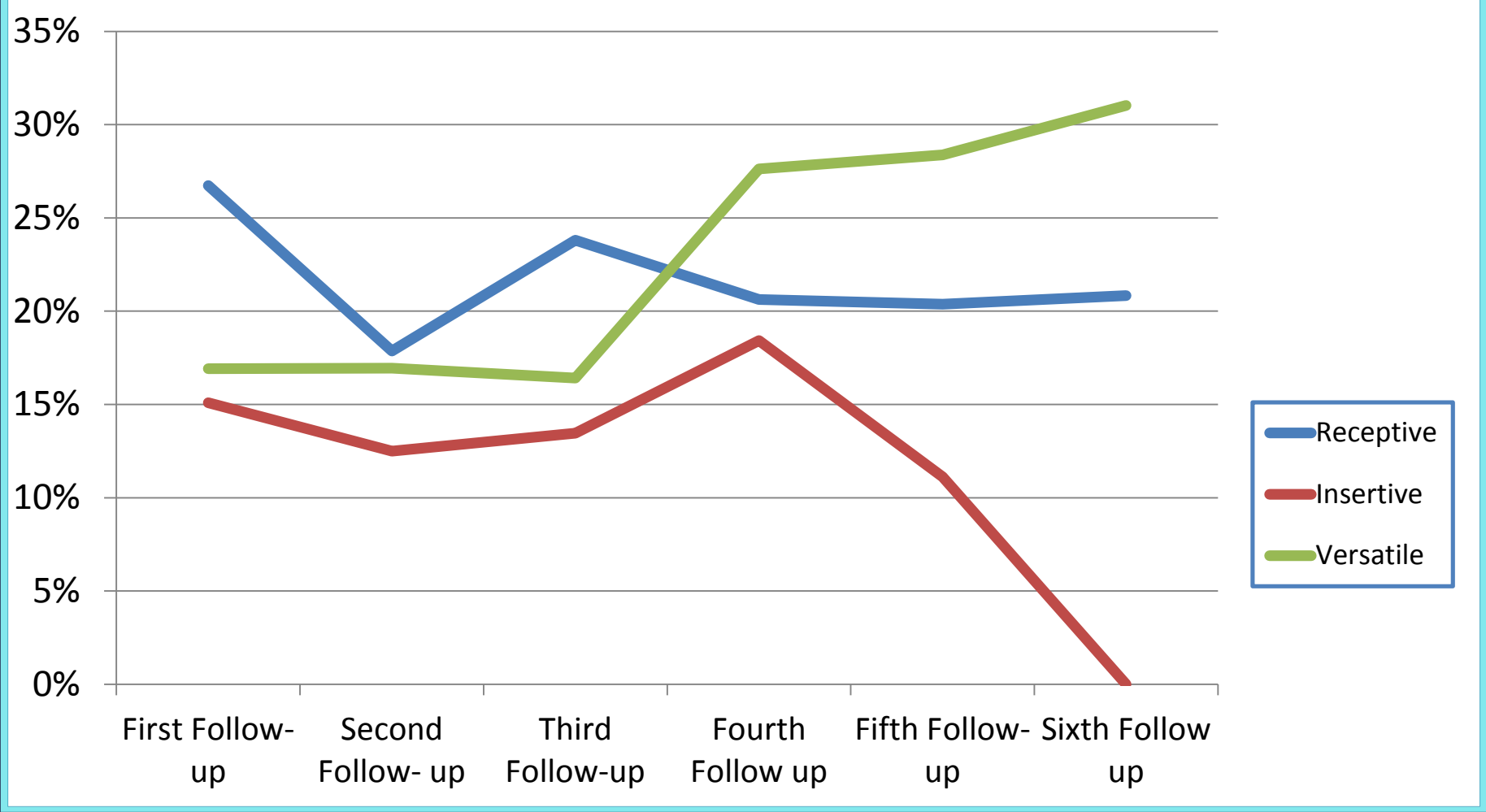
**TABLE 1: Baseline characteristics of the participants in the study across the role during anal sex**

Variables	Receptive n=128	Insertive n=89	Versatile n=184	p value
Age (Years)	32.2 $\pm$ 10.3	31.3 $\pm$ 9.1	31.4 $\pm$ 9.3	0.70
Education				<b>0.01</b>
Primary	5 (3.9)	3 (3.4)	7 (3.8)	
Secondary	63 (49.2)	44 (49.4)	69 (37.5)	
Technical School	33 (25.8)	11 (12.4)	36 (19.6)	
Higher Education	27 (21.1)	31(34.8)	72 (39.1)	
Employment*				0.10
Complete Time	52 (40.6)	52 (58.4)	86 (46.7)	
Partial Time	50 (39.1)	26 (29.2)	60 (32.6)	
Unemployed	26 (20.3)	11 (12.4)	38 (20.7)	
Income (USD)*	241 (128-321)	257 (192-385)	257 (160- 401)	<b>&lt;0.01</b>
Transgender Woman	60 (46.9)	2 (2.3)	27 (14.7)	<b>&lt;0.01</b>
# of Sexual Partners*	5 (2-20)	3 (1-6)	5 (2-10)	<b>&lt;0.01</b>
Alcohol Use (AUDIT Score)*	6.4 $\pm$ 5.3	7.7 $\pm$ 5.3	8.2 $\pm$ 5.7	<b>0.02</b>
Drug Use*	7 (5.5)	5 (5.6)	13 (7.1)	0.86
Condomless intercourse*	108 (90.0)	83 (94.3)	170 (95.5)	0.18
HIV Positive	43 (33.6)	13 (14.6)	68 (36.9)	<b>&lt;0.01</b>
Center				0.16
Epicentro	48 (37.5)	34 (38.2)	87 (47.3)	
Barton	80 (62.5)	55 (61.8)	97 (52.7)	
Mean $\pm$ Standard Deviation; Median (Interquartile range); Number (Percent) * in the last 3 months				

**TABLE 2: Crude and adjusted model for the association between sexual role during anal sex and syphilis**

Variables	Crude OR (IC 95%)	p value	Adjusted OR (IC 95%)	p value
Sexual Role				
Receptive	2.60 (1.40-4.81)	<0.01	2.49 (1.23-5.03)	<b>0.01</b>
Versatile	2.34 (1.29-4.24)	<0.01	2.37 (1.27-4.47)	<b>&lt;0.01</b>
Insertive	Ref	--	Ref	--
Age (Years)	1.03 (1.01-1.05)	<0.01	1.05 (1.02-1.07)	<b>&lt;0.01</b>
Education				
Primary	Ref	--	Ref	--
Secondary	0.59 (0.25-1.42)	0.24	0.74 (0.27-2.05)	0.56
Technical School	0.68 (0.27-1.71)	0.42	0.67 (0.22-2.04)	0.48
Higher Education	0.45 (0.18-1.12)	0.09	0.42 (0.14-1.30)	0.13
Employment*				
Complete Time	Ref	--	Ref	--
Partial Time	1.20 (0.79-1.84)	0.39	1.25 (0.77-2.02)	0.36
Unemployed	1.18 (0.71-1.95)	0.53	1.34 (0.75-2.42)	0.33
Income (USD)*	1.00 (0.99-1.00)	0.23	1.00 (0.99-1.00)	0.16
Transgender Woman	1.16 (0.74-1.81)	0.52	0.75 (0.41-1.38)	0.36
# of Sexual Partners*	1.00 (0.99-1.00)	0.73	1.00 (0.99-1.00)	0.90
Alcohol Use (AUDIT Score)*	1.01 (0.97-1.04)	0.73	1.02 (0.98-1.05)	0.35
Drug Use*	0.69 (0.29-1.65)	0.41	0.59 (0.23-1.50)	0.27
Condomless Intercourse*	1.54 (0.66-3.56)	0.32	1.83 (0.76-4.42)	0.18
HIV Positive	1.23 (0.86-1.76)	0.25	1.05 (0.71-1.55)	0.80
Center				
Epicentro	Ref	--	Ref	--
Barton	0.94 (0.64-1.38)	0.75	0.64 (0.37-1.00)	<b>0.05</b>
Abbreviators: AUDIT, Alcohol Use Disorders Identification Test; OR, Odds Ratio, USD, United State Dollar *in the last 3 months				

**FIGURE 1: Cumulative Incidence syphilis across role during anal sex role in the follow-up**



## RESULTS

- At baseline, among the 401 participants; when asked about their role in anal sex, 32%, 46% and 22% reported being receptive, versatile and insertive, respectively.
- Prevalence of active syphilis was 22% at baseline; cumulative incidence was 18% and 23% at the third and sixth follow-up visits, respectively. The figure 1 shows the cumulative incidence across study group in the follow-up.
- The characteristics of the population across the study groups are described in Table 1
- In multivariate analysis, the odds for incident syphilis were higher among people who had defined their anal sex role as receptive (aOR = 2.49 (95% CI 1.23-5.02) or versatile (aOR = 2.37 (95% CI 1.27-4.47) as compared to the insertive role (Table 2).

## DISCUSSION

- MSM/TW who defined their role during anal sex as receptive or versatile showed a significantly higher syphilis incidence in this longitudinal analysis.
- Many studies show that receptive anal sex is associated with a higher incidence of HIV (3). Anal intercourse causes trauma to the anus or rectum, creating a portal of entry to the bloodstream for HIV. This mechanism could be extrapolated to Treponema pallidum.
- Another plausible reason for this finding is that primary syphilis is characterized by a painless ulcer. Since men who are receptive may in fact have this lesion inside their rectum, they are even less likely to come to seek medical care than those practicing insertive anal sex.
- Further research is needed to assess whether this association can be explained by behavioral/sexual networking patterns, biological reasons, or both.

## BIBLIOGRAPHY

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**Acknowledgements:**  
We want to acknowledge all the staff of Barton and Epicentro for their help in conducting this study. We also thank the team at the Unit of Health, Sexuality and Human Development at the Universidad Peruana Cayetano Heredia for their support.