

Prevalence and risk of sexually transmitted infections among HIV-infected index cases and their HIV-uninfected partners

HPTN 052

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Introduction

- Sexually transmitted Infections (STIs) remain a public health concern
 - In 2012, an estimated 357.4 million had new infections (chlamydia, gonorrhea, syphilis, and trichomoniasis)
- STIs are linked to pregnancy related complications
 - Spontaneous births, preterm births, stillbirths
- STIs are a marker of unsafe sexual practices
- STIs may be undermining HIV preventative strategies
 - STIs in HIV-infected persons increase the risk of transmitting HIV
 - STIs in HIV-uninfected persons increase the risk of acquiring HIV

Specific Aims

- **Aim 1:** Estimate the prevalence of STIs at enrollment among HIV-infected index cases and their HIV-uninfected partners enrolled in the HPTN 052 clinical trial
- **Aim 2:** Compare the risk of STI acquisition between HIV-infected index cases and their HIV-uninfected partners

Study population

- Serodiscordant couples enrolled in the HPTN 052^{1,2}
 - Index cases randomized to:
 1. Immediate ART upon enrollment + HIV primary care
 2. HIV primary care + delayed ART until CD4+ below or within 200 – 250 cells/mm³
- All index cases had CD4 350 – 550 cells / mm³ at enrollment
- Study sites: Brazil, Botswana, India, Kenya, Malawi, South Africa, Thailand, USA, Zimbabwe
- STIs were evaluated at enrollment and yearly visits, partner seroconversion, and as clinically indicated

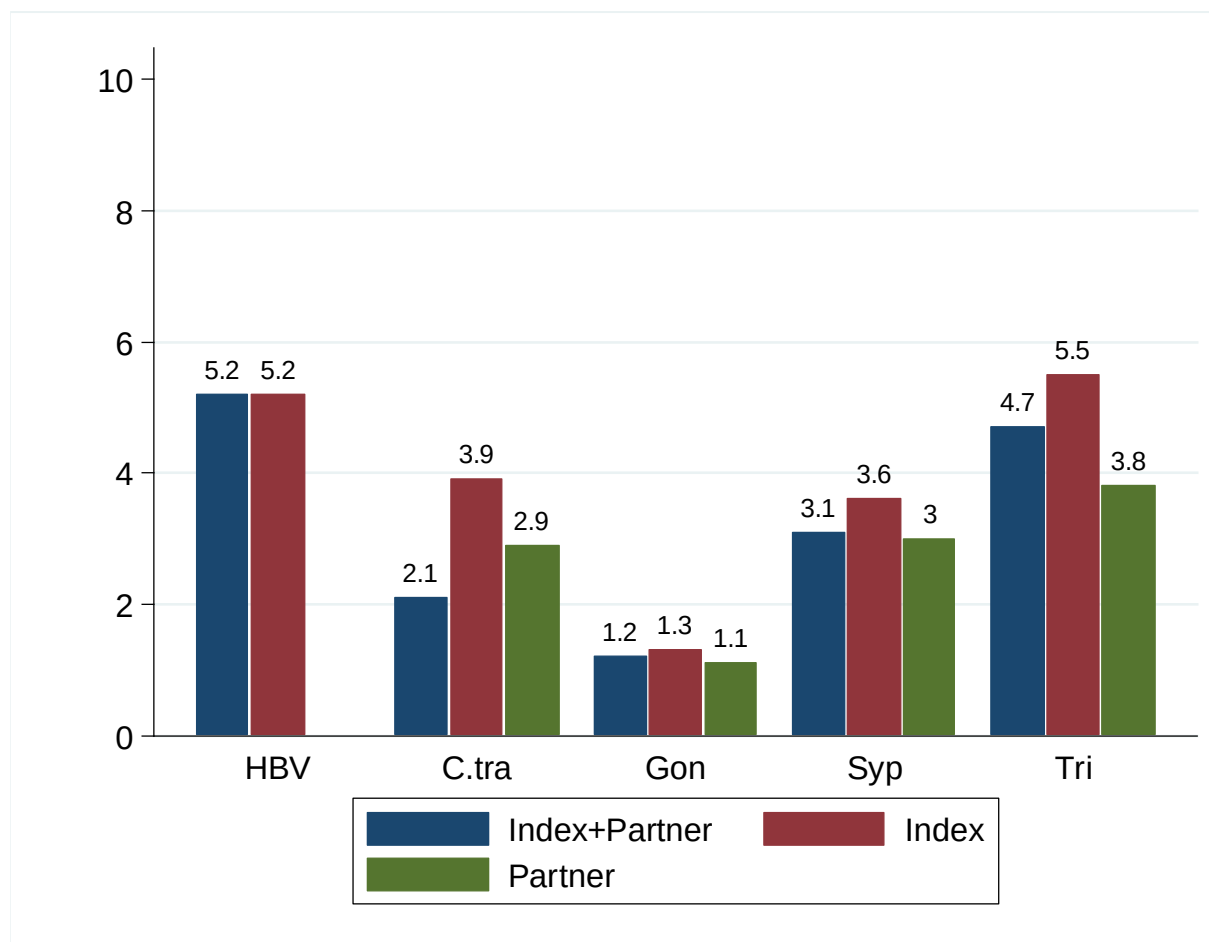
1. Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *The New England journal of medicine*. Aug 11 2011;365(6):493-505.

2. Cohen MS, Chen YQ, McCauley M, et al. Antiretroviral Therapy for the Prevention of HIV-1 Transmission. *The New England journal of medicine*. Sep 1 2016;375(9):830-839.

Statistical methods

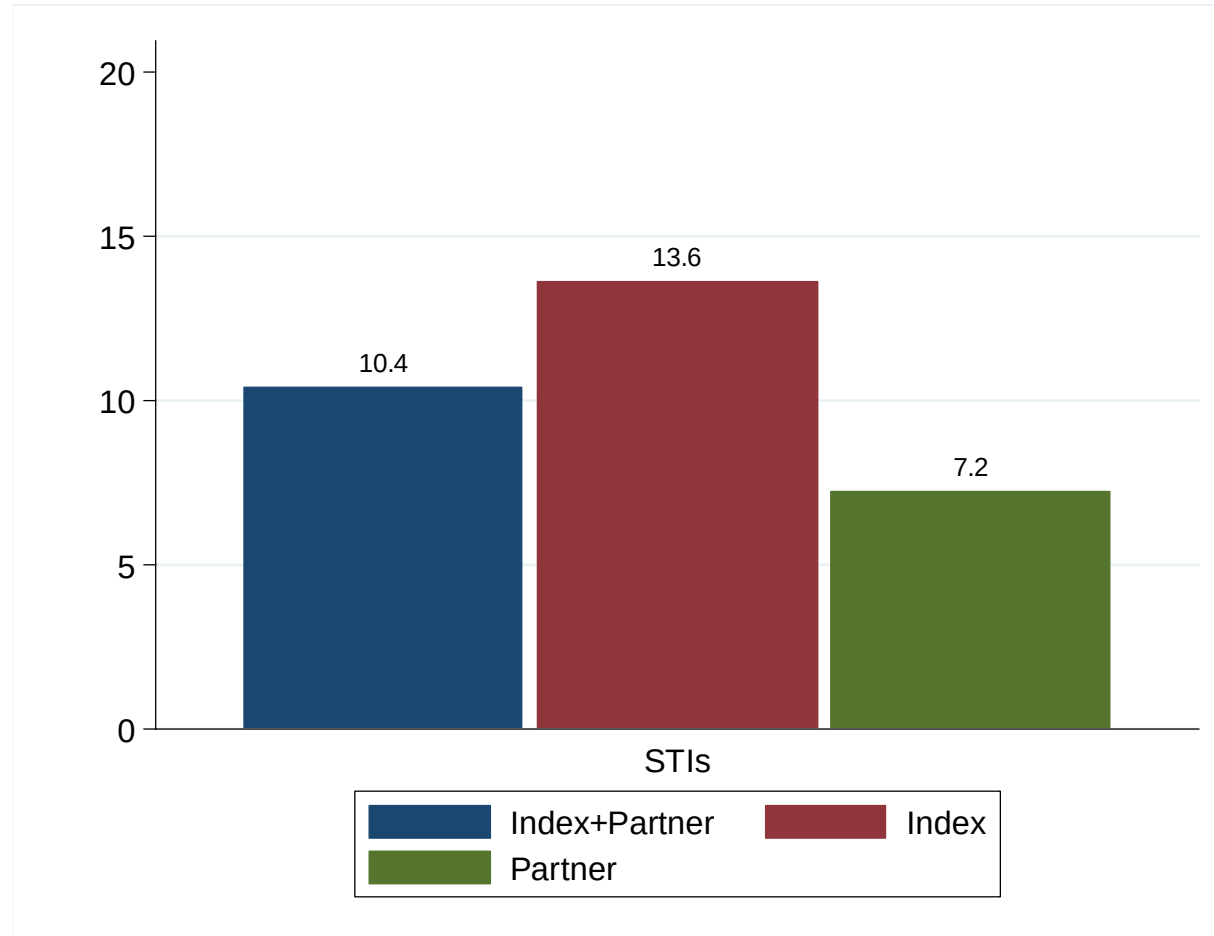
- STI defined as a positive diagnosis for any of the following:
 - Hepatitis B virus, Chlamydia trachomatis, Gonorrhea, Syphilis, or Trichomonas vaginalis
- Estimated prevalence of STIs at enrollment
 - Log binomial regression was to identify factors associated with STIs
- Generalized Estimating Equation models with Poisson link function were used to compare risk of STI acquisition between HIV-infected index cases and their HIV-uninfected partners
 - Stratified by gender

STIs prevalence at enrollment



HBV: Hepatitis B virus; C.tra: C. trachomatis; Gon: Gonorrhea; Syp: Syphilis; Tri: Trichomonas vaginalis

STI prevalence at enrollment



STI: Hepatitis B virus, C. trachomatis, Gonorrhea, Syphilis, or Trichomonas vaginalis

Table 1: Couple risk factors for prevalent STIs at enrollment

Demographic Characteristics		STI		Unadjusted PR (95% CI)	Adjusted PR (95% CI)
		Yes N (%)	No N (%)		
Gender	Male	166 (9.3)	1619 (90.7)	1.0	1.0
	Female	197 (11.6)	1499 (88.4)	1.25 (1.03–1.52)	1.29 (1.01–1.66)
Marital status	Married/living with partner	334 (10.2)	2949 (89.8)	1.0	1.0
	Unmarried	29 (16.4)	169 (83.6)	1.44 (1.01, 2.05)	1.60 (1.03, 2.49)
Education	No Schooling	37 (10.5)	314 (89.5)	1.0	1.0
	Primary School	173 (12.8)	1180 (87.2)	1.21 (0.87–1.70)	1.50 (0.94–2.37)
	Secondary School	128 (8.8)	1319 (91.2)	0.84 (0.59–1.19)	1.05 (0.65–1.69)
	Post-Secondary School	25 (7.6)	305 (92.4)	0.72 (0.44–1.17)	0.82 (0.43–1.62)
Age	(Median (IQR))	33 (27, 39)	32 (27, 39)	0.97 (0.87–1.09)	0.95 (0.83–1.10)

Table 1: Couple risk factors for prevalent STIs at enrollment

Sexual Behavior Characteristic		STI		Unadjusted PR (95% CI)	Adjusted PR (95% CI)
		Yes (N (%))	No (N (%))		
Circumcised	No	141 (9.5)	1351 (90.5)	1.0	
	Yes	17 (7.1)	222 (92.9)	0.75 (0.46–1.22)	
Total sex acts in the past week	No sex	3 (33.3)	6 (66.7)	3.42 (1.35–8.68)	
	1 – 7	243 (9.7)	2250 (90.3)	1.0	
	> 7	6 (15.8)	32 (84.2)	1.62 (0.77–3.41)	
Total condom use in the past week	No condoms	18 (15.0)	102 (85.0)	1.0	1.0
	1 – 7	229 (9.6)	2162 (90.4)	0.64 (0.41–0.99)	0.65 (0.41–1.01)
	>7	5 (17.2)	24 (82.8)	1.15 (0.47–2.84)	1.12 (0.45–2.74)

Table 2: STI incidence among couples during follow up

	Number of participants tested	Number of infections	Couple Follow-up time (years)	Incidence Rate /year
Hepatitis B virus	46	5	256.12	0.0195
Chlamydia trachomatis	1715	204	9543.25	0.0214
Gonorrhea	1715	158	9543.25	0.0166
Trichomonas vaginalis	1640	233	9198.80	0.0253
STI	1715	561	9543.25	0.0570

STI: Hepatitis B virus, C. trachomatis, Gonorrhea, or Trichomonas vaginalis

Table 3: Comparison of STI incidence between index cases and partners

Index status	Gender	Number of participants tested	No. of Infections	Follow-up time	Unadjusted IRR (95% CI)	Adjusted IRR [†] (95% CI)
Partner	Male	838	89	3977.07	1.0	1.0
	Female	813	121	4194.33	1.26 (0.91–1.75)	0.82 (0.51–1.31)
Index	Male	859	58	4831.17	0.52 (0.35–0.77)	0.66 (0.40–1.07)
	Female	840	293	4700.98	2.70 (2.08–3.50)	2.50 (1.74–3.60)

STI: Hepatitis B virus, C. trachomatis, Gonorrhea, or Trichomonas vaginalis

[†] Adjusted for age, education, marital status and condom use

Summary

- STI prevalence at enrollment was slightly higher among HIV-infected index cases compared to their HIV-uninfected partners
- STI prevalence at enrollment was higher among females and unmarried participants
- HIV-infected female index participants were more likely to acquire STIs compared to HIV-uninfected male partners
- Incident STIs were relatively common in HIV discordant couples despite high degrees of counseling, condom promotion in a clinical trial setting.
 - This highlights the importance of continued STI counseling and need for condom use even to prevent adverse sequela from bacterial STIs

Summary

- Limitations:
 - Herpes simplex virus type 2, a common STI, was not evaluated
 - HIV-infected index cases may have had more opportunities to be evaluated than HIV-uninfected partners

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