The burden of STIs in an HIV hyperendemic community with high ART coverage

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BACKGROUND

- Population-level data on sexually transmitted infections (STIs) are rare in sub-Saharan Africa, despite high HIV prevalence.
- We measured the prevalence of HIV and five STIs following the roll-out of voluntary medical male circumcision and universal HIV treatment programs in an HIV hyperendemic Lake Victoria fishing community in Uganda.

METHODS

- We measured prevalence of *Chlamydia trachomatis* (CT), *Neisseria gonorrhoeae* (NG), *Trichomonas vaginalis* (TV), syphilis, and herpes simplex virus type 2 (HSV-2) among all consenting adults aged 15-49 residing in a high HIV prevalence Lake Victoria fishing community and participating in the Rakai Community Cohort Study between May and July 2019.
- CT and NG testing was conducted using nucleic acid amplification testing (Abbott RealTime CT/NG assay).
- Point-of-care testing was done for TV (OSOM Trichomonas) and syphilis (non-treponemal SDBioline rapid syphilis tests), with subsequent laboratory confirmation of syphilis titers using a rapid plasma reagin (RPR) test (Cypress Diagnostics).
- Participants were classified as having active syphilis infection if their RPR titers were ≥1:8. HSV-2 testing was performed with the Kalon HSV-2 IgG ELISA.
- Associations of STIs with ART use and male circumcision were estimated using Poisson regression with robust variance estimators, and are reported as prevalence risk ratios with 95%CI.
- All participants were provided with free HIV and STI treatment per WHO guidelines.

Images of study community and research team and activities

- **There is extremely high burden of HIV and non-HIV STIs in Uganda's Lake Victoria fishing communities despite high ART coverage.**
- **Syphilis and trichomonas infections are most likely to co-occur with HIV.**
- **Most STIs are asymptomatic.**
- **Integrated HIV and STI care could substantially lower STI burden improving population, maternal, and child health.**

RESULTS

- There were 898 participants, including 435 women (48%); 9% (n=47) were pregnant.
- There were 398 participants (40%) who were HIV seropositive.
- Coverage of ART was 87% (n=313) among HIV seropositive persons and 57% of men (n=264) were circumcised.
- Overall, there was 8.5% prevalence of NG (n=76), 9.9% CT (n=88), and 12.1% TV (n=108).
- Syphilis reactivity was 24.1% (n=216), with 9.5% (n=85) of the total population having titers indicative of active syphilis infection, including 6% of pregnant women (n=3). ‘
- HSV-2 seroprevalence was 70% (95%CI: 0.67-0.73) overall.
- Prevalence of at least one STI (NG, TV, CT, or active syphilis) was 1.57 fold higher among HIV-positive versus HIV negative persons (34 vs 21%; 95%CI: 1.20-2.05)

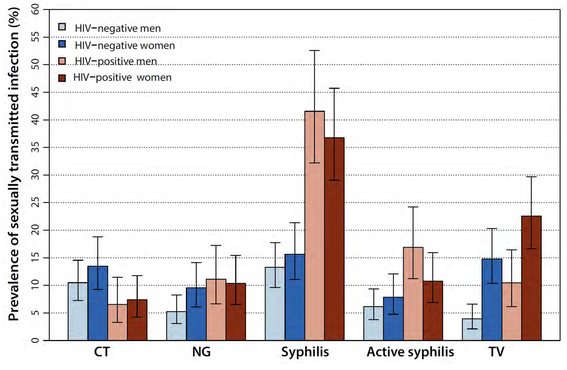

Figure 1. Prevalence of STIs by HIV status and sex

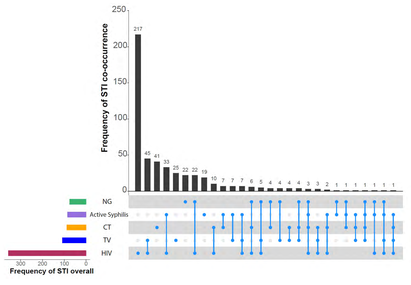

Figure 2. Co-occurrence of selected STIs; Figure shows STIs and their co-occurrence (or not) with other STIs; HIV most commonly co-occurred with TV and active syphilis.

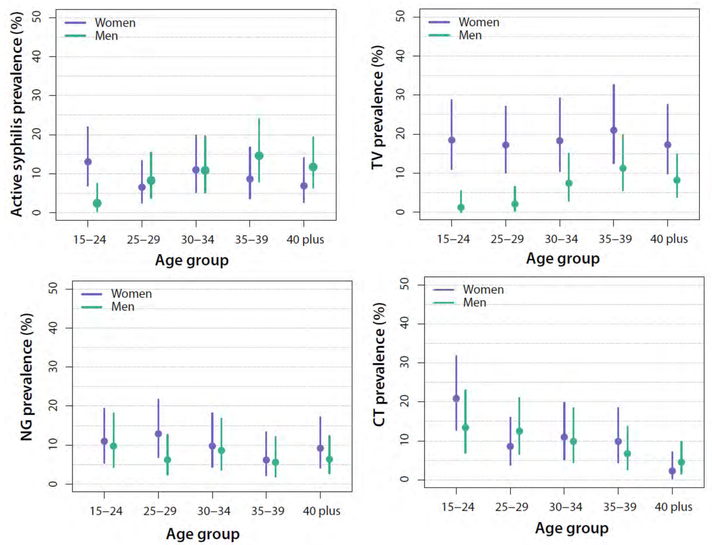

Figure 3: Age and sex specific prevalence of active syphilis, TV, NG and CT; error bars show 95% confidence intervals

Table 1. Associations of ART use among HIV positive persons and male circumcision among men with syphilis, CT, NG and TV.

	Syphilis	Active syphilis	CT	NG	TV
	PRR (95%CI)	PRR (95%CI)	PRR (95%CI)	PRR (95%CI)	PRR (95%CI)
ART use	1.19 (0.77-1.84)	0.84 (0.40-1.76)	1.03 (0.32-3.3)	0.40 (0.21-0.76)	0.83 (0.44-1.56)
Male circumcision	0.71 (0.51-1.00)	1.03 (0.59-1.81)	1.67 (0.89-3.13)	0.80 (0.41-1.53)	0.42 (0.20-0.88)

	Men (N=463)				Women (N=435)			
	Active syphilis	CT	NG	TV	Active syphilis	CT	NG	TV
Symptom	N=45	N=42	N=33	N=28	N=40	N=46	N=43	N=80
ulcer	4.4% (2)	2.4% (1)	0 (0)	3.6% (1)	12.5% (5)	8.7% (4)	12% (5)	6.3% (5)
discharge	2.2% (1)	12% (5)	33% (11)	7.1% (2)	38% (15)	35% (16)	42% (18)	41% (33)
frequent urination	4.4% (2)	4.8% (2)	15% (5)	11% (3)	20% (8)	24% (11)	9.3% (4)	18% (14)
pain urination	11% (5)	4.8% (2)	24% (8)	11% (3)	18% (7)	17% (8)	9.3% (4)	13% (10)
pain during sex	4.4% (2)	2.4% (1)	12% (4)	0 (0)	7.5% (3)	11% (5)	12% (5)	5% (4)
bleeding during sex	0 (0)	0 (0)	0 (0)	0 (0)	3% (1)	0 (0)	0 (0)	0 (0)
thick discharge	-	-	-	-	35% (14)	25% (9)	35% (15)	34% (27)
vaginal itching	-	-	-	-	25% (10)	26% (12)	21% (9)	36% (29)
vaginal odor	-	-	-	-	25% (10)	11% (5)	21% (9)	18% (14)
Any symptom	**18% (8)**	**19% (8)**	**36% (12)**	**18% (5)**	**55% (11)**	**48% (22)**	**58% (25)**	**65% (52)**

Table 2. Self-reported symptoms among those with a diagnosed STI stratified by sex

CONCLUSIONS

- Despite high coverage of HIV treatment and prevention interventions, the burden of STIs remains extremely high in Lake Victoria fishing communities.
- Most non-HIV STIs are asymptomatic.
- There is an urgent need to integrate STI diagnostic testing and treatment with HIV services in these high HIV burdened settings.

ACKNOWLEDGEMENTS

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