

uninfected partners: 38.3% (Bateyes-DR), 35.4% (Haiti), 33.3% (DR), 32.1% (Cambodia), and 39.6% (India). Limited sero-discordancy was observed at the population-level with at most two out of every 100 adults in reproductive age being engaged in a SDC.

Conclusions Our findings are consistent with HIV sero-discordancy patterns in low prevalence settings in SSA. While the large sero-discordancy among SCs affected by HIV offers an opportunity for HIV prevention, the small number of SCs affected by HIV at the population-level suggests logistical difficulties for implementing SDC-targeted prevention interventions in these countries.

P3.207 THE INFLUENCE OF COLLEGE STUDENTS IN A SEXUAL NETWORK OF YOUNG AFRICAN-AMERICAN MEN

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Background Young Black men who have sex with men (MSM) are disproportionately affected by HIV and STIs in North Carolina (NC). Behavior and STI prevalence in the sexual network affect transmission risk; network position may be a marker for risk.

Methods We constructed the local sexual network from reportable HIV and syphilis cases diagnosed among Black men age 15–30 in north central NC from 2006–2009 (N = 1100); infected and uninfected contacts were included in the network. Bonacich power is an unbounded measure of network centrality derived from the number of contacts and number of contacts' contacts. Higher Bonacich scores represent increased centrality in the network, while accounting for the centrality of an individual's contacts. It is iterative, giving more weight to closer contacts. To assess the centrality of college status in the network, Bonacich scores and 95% confidence intervals (95% CI) were calculated for all college-age Black men (17–24 years) (n = 385). We computed t-tests and chi-square tests to measure score differences by college status for factors associated with HIV infection risk.

Results Bonacich scores were normally distributed (range –57.5–62.2). Mean score was higher for college than non-college men (5.86 (95% CI: 4.69–7.04) v. 3.13 (95% CI: 2.51–3.76), $P < 0.0001$). College men were more likely to use dating sites and less likely to use marijuana than non-college men. Sexual orientation also differed significantly by college status: while the proportion of MSM was ~70%, college men were more likely to be bisexual (24% v. 11%) and less likely to be heterosexual (7% v. 22%) compared to non-college men. College status was not associated with diagnosis, STI history, alcohol use, or having anonymous partners.

Conclusion Young African-American college men are more central in this sexual network than young African-American men who are not in college, putting them at risk for HIV acquisition and transmission.

P3.208 SPATIAL VARIABILITY IN THE DECLINE OF HIV PREVALENCE IN THREE COUNTRIES IN SUB-SAHARAN AFRICA

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Background HIV prevalence is decreasing in large parts of sub-Saharan Africa (SSA), but the impact of this decline on the geographical heterogeneity of HIV infectious burden is not well understood. We explored and described aspects of the spatial and temporal heterogeneity of the epidemic in three countries in SSA.

Methods Data were obtained from Demographic and Health Surveys conducted at different times in Malawi, Tanzania, and Kenya. We identified and compared spatial clusters with high numbers of HIV infections at two different times from each country using Kull-dorff spatial scan test. The test locates areas with higher numbers of HIV infections than expected under spatial randomness. For each identified cluster, a likelihood ratio test was computed. A P -value was then determined through Monte Carlo simulations to evaluate the statistical significance of each cluster.

Results The table summarises the main results. We found no evidence of decline in HIV prevalence within clusters with high HIV prevalence despite the statistically significant decline in the national HIV prevalence in Malawi and Tanzania. National HIV prevalence decreased by 19% in Malawi, and 17% in Tanzania; meanwhile, HIV prevalence in areas outside of the clusters declined by 33% and 30%, respectively. There was no statistically significant decline in the national HIV prevalence in Kenya, but HIV prevalence within clusters increased by 27%.

Conclusions We found marked spatial variability in the decline of HIV prevalence in the three studied SSA countries. Even in the presence of declining national HIV prevalence, HIV prevalence in the high HIV prevalence clusters either did not decline or even increased. Most of the gains in reducing HIV disease burden did not occur in the areas of most intense HIV transmission, but in areas outside of the clusters. Our findings provide insights for resource allocation and HIV prevention interventions in these countries.

Abstract P3.208 Table 1

Country		Survey 1 (2003–2004) HIV prevalence (%)	Survey 2 (2009–2010) HIV prevalence (%)	P value
Malawi	National	12.52	10.13	< 0.001
	Within clusters	15.32	14.83	0.59
	Outside clusters	10.35	6.97	< 0.001
Tanzania	National	6.50	5.38	< 0.001
	Within clusters	9.85	9.34	0.49
	Outside clusters	5.13	3.61	< 0.001
Kenya	National	6.59	6.30	0.62
	Within clusters	10.77	13.72	0.01
	Outside clusters	5.37	4.66	0.11

P3.209 LOW RATES OF STI CO INFECTION OBSERVED IN HIV POSITIVE WOMEN PARTICIPATING IN AN HPV VACCINE STUDY IN CANADA

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Background HIV positive women with sexually transmitted infections (STIs) face increased reproductive health risks and negative health outcomes. This sub-analysis was performed to determine the co-factors associated with a history of STI's in this high-risk population.

Methods Data was collected as part of an ongoing multi-centred study of the immunogenicity and safety of a quadrivalent HPV vaccine in HIV+ women in Canada. Clinical data, along with genital HPV-DNA sampling and liquid based cervical cytology data, was collected 3 months prior to initial vaccination.

Results Of the 255 sexually active women in this sub-analysis, characteristics were: mean age of 37, ethnicity: black 42%, white 36%, aboriginal 11% and other 10%. Mean number of lifetime sexual partners 5 (3–15), 70% of women were sexually active within

the last year, 18% with a new partner. Condom use with sexual intercourse was reported at 37% every time, 26% sometimes and 37% never. 63.5% of women reported ever having an STI. Specifically; herpes 31%, condylomas 29%, chlamydia 22%, gonorrhoea 15%, trichomonas 13% and syphilis 9%. Multivariable logistic regression was used to determine predictors associated with history of an STI. Compared to black women, white women (OR = 2.4, $p < 0.02$) and aboriginal women (OR = 7.9, $p < 0.01$) were more likely to report an STI. Older women were less likely (OR = 0.5/5 years, $p = 0.02$) and women who had been sexually active for longer were more likely to report an STI (OR = 2.5, $p = 0.001$).

Conclusion A reported history of STI infection was notably higher in aboriginal and white women compared to black women. Younger women and those with more years of sexual activity were also more likely to report a prior STI. Despite a substantive history of STI's once engaged in HIV care a significantly lower incidence of concurrent active STI's was observed in this population of women.

P3.210 HIV AND SYPHILIS CO-INFECTION IN PATIENTS ATTENDING AAR HEALTH SERVICES CLINIC IN UGANDA

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Background AIDS remains a leading cause of mortality in Sub Saharan Africa accounting for almost half of the worlds HIV related deaths. On the other hand bacterial sexually transmitted infections (STIs) such as syphilis exert a heavy toll in terms of morbidity and mortality in the developing world. Syphilis in HIV positive people may increase HIV transmissibility and adversely affect reproductive health. Diagnosis and treatment of curable STIs in HIV infected persons can aid in preventing spread to partners.

Methods AAR Health Services provides prevention, care and treatment services to the general population. Between December 2011 and December 2012, we screened and tested 4,350 patients with symptoms of genital ulcer disease, urethral and abnormal vaginal discharges to diagnose HIV and Syphilis infection. Participants were counselled before screening and testing. Serological diagnosis of HIV included the use of three rapid test kits in sequence (Determine®, Statpak® and Unigold®). Serological diagnosis of syphilis involved conducting a *Treponema pallidum* - specific antigen test, *Treponema pallidum* haemagglutination test. Persons with a positive serology were treated for syphilis with 3 intramuscular doses of 2.4 mU of benzathine penicillin administered once weekly.

Results Overall, the HIV prevalence was 8.2% while that of Syphilis was 5.4%. Syphilis was significantly more predominant among female clients as compared to male clients. The rate of HIV-syphilis co-infection was 4.2%.

Conclusions The rate of HIV-syphilis co infection among patients who attend AAR Health Services clinic is at the increase. Early screening of Syphilis and other STIs is an effective initiative for detecting and controlling treatable STIs and curbs spread of HIV to partners. A number of primary preventive interventions for HIV and syphilis need to be adopted including use of condoms and medical male circumcision in order to improve sexual and reproductive health amongst AAR clients.

P3.211 EXTREMELY HIGH RISK OF SYPHILIS CO-INFECTION AND RE-DIAGNOSIS AMONG MEN WHO HAVE SEX WITH MEN LIVING WITH HIV IN ONTARIO, CANADA

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Background Since 2000, new syphilis cases increased ten-fold in Canada, particularly among men who have sex with men (MSM) co-infected with HIV. We calculated the prevalence and incidence of syphilis in a large cohort of HIV-positive MSM.

Methods We analysed data from 2,903 MSM followed from 2000 to 2009 in the OHTN Cohort Study, an ongoing cohort of persons in HIV care in Ontario, Canada. Syphilis serology was obtained via record linkage with the provincial public health laboratories. We classified reactive rapid plasma reagin results as acute ($\geq 16:1$) or non-acute ($\leq 8:1$) and calculated the lifetime and annual prevalence of syphilis and incidence of new syphilis diagnoses and re-diagnoses. Risk factors were identified using Poisson regressions and are reported as rate ratios (RR) with 95% confidence intervals (CI).

Results We linked 7,036 syphilis results from 2,422 men (83.4%). Lifetime prevalence was 23.4% (95% CI 21.7, 25.2) by 2009. The annual prevalence of acute syphilis increased from 0.1% (95% CI 0.002, 0.5) in 2000 to 3.8% (95% CI 3.0, 4.6) in 2009. Among 1505 men with a negative specimen, incidence of first syphilis infection was 2.7/100PY (95% CI 2.3, 3.1), with higher rates in men who were aged < 30 years (RR = 2.8, 95% CI 1.4–5.5), ART-naïve (RR = 1.7, 95% CI 1.2–2.5), and had high viral load ($> 100,000$ copies/mL cf undetectable: RR = 1.8, 95% CI 1.1–3.0). Incidence rose over time, peaking in 2009 at 3.97/100PY (95% CI 3.0, 5.2). Among 591 men with past infection, the rate of re-diagnosis was 4.8 per 100PY (95% CI 3.7, 5.5), with 35% experiencing multiple re-diagnoses.

Conclusion Syphilis incidence among HIV-positive MSM was over 300 times greater than in the general male population. Temporal and regional trends mimicked provincial surveillance reports and remain extremely high despite public health education and testing campaigns. Re-diagnosis was common, suggesting treatment failure or re-infection. Novel syphilis control efforts are urgently needed.

P3.212 YOUNG PERSONS AND MEN WHO HAVE SEX WITH MEN ARE MORE LIKELY TO HAVE HAD AN EARLY SYPHILIS DIAGNOSIS SHORTLY BEFORE OR AFTER AN HIV DIAGNOSIS

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Background High rates of HIV co-infection have been observed in recent syphilis epidemics, and persons diagnosed with HIV and early syphilis (ES) within a short period of time may be an appropriate focus for targeted HIV control strategies. Targeted control strategies seek to prevent HIV transmission by focusing specifically on those most likely to transmit, i.e., high viral load or concurrent STIs. To implement targeted HIV control in Baltimore, Maryland, we sought to characterise persons newly diagnosed with HIV who also received an ES diagnosis.

Methods Using retrospective public health surveillance data of newly diagnosed HIV cases reported to the Baltimore City Health Department from 2009 to 2011, we measured the proportion of persons with ES diagnoses. Chi-square tests were used to assess differences in age ($> = 30$ vs. < 30), gender, and sexual orientation by infection (HIV only vs. ES-HIV).

Results Of the 811 persons with newly diagnosed HIV, 104 (12.8%) also received at least one ES diagnosis between 2009 and 2011, 95% of whom were male. Compared to persons receiving only an HIV diagnosis, persons receiving both HIV and ES diagnoses were more likely to be younger (35.8% vs. 69.2%, $p < 0.001$, respectively) and men who have sex with men (MSM) (24.3% vs. 62.5%, $p < 0.001$, respectively). When controlling for sexual orientation, younger age was significantly associated with ES among men who have sex with women (MSW) (28.0% vs. 64.7%, $p < 0.01$, respectively) and females (25.9% vs. 80.0%,