

in married women, and 5.4% (4.1% to 7.0%) in divorced/widowed women. HIV prevalence was higher in women with concurrent partners than in those without (55.7% vs 25.4%; aOR, 3.26, 2.08 to 5.11) even after excluding women who had not started sex (aOR, 2.83; $p < 0.001$). For males, non-spousal concurrency fell from 11.7% (95% CI 10.8% to 12.7%) in 1998–2000 to 6.1% (5.3% to 7.0%) in 2001–2003 and 4.3% (3.7% to 5.0%) in 2006–2008; prevalence of spousal concurrency fell from 3.7% (3.2% to 4.3%) to 2.6% (2.0% to 3.2%) to 1.3% (1.0% to 1.7%) over the same period. For females, concurrency declined from 1.7% (1.4% to 2.1%) in 1998–2000 to 1.0% (0.7% to 1.3%) in 2001–2003 and 0.5% (0.3% to 0.7%) in 2006–2008.

Conclusion A 2/3rds reduction in (mainly non-spousal) concurrency may have contributed to HIV decline in east Zimbabwe.

Epidemiology oral session 7: Neglected issues in anal STIs and transmission

01-S07.01 THE RELATIVE CONTRIBUTION OF ANAL INTERCOURSE AND PRIMARY INFECTION TO MATURE HETEROSEXUAL HIV EPIDEMICS

doi:10.1136/sextrans-2011-050109.37

M C Boily, Imperial College, London, UK

Background Current epidemiological evidence suggests that receptive anal intercourse (RAI) considerably increases the risk of HIV infection per sex act (RRRAI) compared to vaginal intercourse (VI). RAI may increase HIV risk to a similar extent or more than primary HIV infection (PI) (ie, recent infection) increases infectivity compared to asymptomatic infection (RRPI). Considerable attention has been placed to understand the role of PI to HIV epidemics. However, the potential role of RAI to heterosexual HIV epidemics has never been assessed even if it seems to be a relatively common practice in many settings. We aim to compare the fraction of HIV infections due to AI and PI in a generalised heterosexual epidemic.

Methods A deterministic model of heterosexual HIV transmission during to VI, RAI and insertive AI, incorporating three HIV infectiousness stages was developed (Abstract O1-S07.01 Table 1). Behaviour and HIV prevalence data from Kalishman's *et al* (2009) study in South Africa was used to define plausible ranges of parameter values (Abstract O1-S07.01 table 1). As it is unknown, the degree of mixing during VI between those who engage and do not engage in AI (non-AI) was varied. 20 parameter sets that best fitted HIV prevalence data by AI/non-AI were identified following exploration of 1000 parameter sets selected by uniformly sampling the plausible parameter ranges.

Results Overall, 17%–40% of annual infections (PAF) may be due to RAI and insertive AI (IAI). The PAF due to AI is 2–2.6 larger for female than male (Abstract O1-S07.01 Table 1). In comparison, the overall PAF due to PI is between 25 and 31%, and more similar between gender (PAF female: male 1.0–1.2). Under our assumptions, the PAF due to AI was always larger (smaller) than the PAF due to PI for females (males) (Abstract O1-S07.01 table 1). The PAF due to AI and PI was positively associated with increases in the overall fraction of all sex acts which are AI (%AI), whereas the latter depended on the level of mixing. In order to be able to relax the mixing to make it less assortative, the %AI needed to be reduced to allow more VI between AI and non-AI to occur.

Conclusion Our preliminary results suggest that even a small fraction of AI (<10%) in a population may be as important, to overall HIV transmission in generalised epidemics, as the primary phase of infection, especially for women. Our results are based on the likely assumption that RRRAI equal or larger than RRPI. Focusing

Abstract O1-S07.01 Table 1 Main assumptions and results summary

Main parameters assumptions	Ranges of values in the 20 best fits*
Probability of HIV transmission per VI during asymptomatic phase woman to man / man to woman	0.0013–0.0019/0.0013–0.0019
Duration / increase in infectivity (RR _{PI}) (relative to asymptomatic phase) in each HIV stages	Primary/high = 6 months/9.2-fold Asymptomatic/low = 8 years/onefold Late/medium = 1 year/7.3-fold
Number of sex acts per partner per year	30
Average number of partners per year	2
Overall fraction using condoms during AI or VI (Condom efficacy)	50% (0.90)
a = Degree of mixing between AI and non-AI (a = 0 AI with AI and exclusively VI with exclusively VI, a = 1: proportionate mixing)	0.16–0.71
RR _{RAI} = % Increase in HIV risk per RAI (compared to VI)	7.9 to 19.5-fold
RR _{IAI} = % Increase in HIV risk per insertive AI (compared to VI)	Twofold
Fraction of the population who practice AI	11.5%–13.3%
Fraction of the population who do not practice AI (non-AI or exclusive VI)	86.7–88.5%
Fraction of all sex acts of AI group which are AI women / men	25.3%–52.7%/21.8%–51.8%
Overall fraction of all sex acts which are AI (%AI)	2.9–6.7%
Annual rate of AI who stop AI and become exclusively VI (numbers who leave AI = no who enter AI from VI, in proportion to their respective HIV prevalence)	0.068–0.352
Results	
HIV prevalence simulated:	
Among AI / among non AI (exclusively VI)	19.0%–24.8%/6.8%–11.5%
Overall population	8.5%–12.9%
Cumulative fraction of HIV infections (PAF) annually in mature epidemic due to:	
Anal intercourse	
Women/men	24.7%–54.4% / 9.4%–22.4%
Overall population	17.3–40.0%
Primary phase of HIV infection (ie, recent infections)	
Women/men	23.7%–26.8%/27.3%–37.0%
Overall population	25.5%–31.2%
Ratio of PAF due to AI: PI	
Women/men	1.04–2.14/0.34–0.61
Overall population	0.67–1.30

*Out of 1000 combinations explored.

prevention to reduce AI may be more cost-effective than to test and treat for recent infections.

01-S07.02 CHARACTERISTICS OF WOMEN TESTING POSITIVE FOR RECTAL STIS USING SELF-COLLECTED MAILED SPECIMENS

doi:10.1136/sextrans-2011-050109.38

¹J Ladd, ²Y H Hsieh, ²M Barnes, ²P Agreda, ²N Quinn, ³P Whittle, ²M Jett-Goheen, ²T Hogan, ²C Gaydos. ¹Johns Hopkins School of Public Health, Baltimore, USA; ²Johns Hopkins University, Baltimore, USA; ³Baltimore City Health Department, Baltimore, USA

Background The website <http://www.iwantthekit.org/> (IWTk) began offering self-administered rectal swab kits in addition to vaginal swab kits in January 2009 to test for *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis*.

Methods Swab samples were collected at home by participants and sent by US mail and tested by NAAT (Gen-Probe) assays. Participants submitted separate questionnaires for the vaginal and rectal kits. Data were analysed by STATA, version 11.

Results In 1084 questionnaires from women submitting vaginal swabs to the IWTk program since 2009, 194 (17.9%) reported anal

intercourse (AI) in the last 90 days. Of these women, only 113 (58.2%) also ordered and returned rectal kits for testing. An additional 95 kits were ordered and returned by women who did not report recent AI (82), did not return a vaginal swab (5), or did not answer the AI question on the vaginal questionnaire (8). From a total of 406 rectal kits ordered by women overall, 208 (51.2%) were returned; three had no consent form; thus, 205 were tested. Of those tested, 26 (12.7%) were positive for chlamydia, 5 (2.4%) were positive for gonorrhoea, and 13 (6.3%) were positive for trichomoniasis. Two of these samples were positive for both Chlamydia and gonorrhoea, two for both chlamydia and trichomonas, and one for all three STIs. The total number of women testing positive for any rectal STI was 38 (18.5%), and 35 of these women also received and returned vaginal swabs, 34 of which were tested. Of those tested, 24 (70.5%) were positive for at least one of the three STIs vaginally, indicating that women who tested positive for rectal STIs were at very high risk for vaginal STIs. Of the 38 women with rectal STIs, the median age was 22 yr. and the median age of first rectal sex was 20 yr. Questionnaires demonstrated 93.6% were single, 62.5% were Black, and 21.9% were White. Of the women with rectal STIs, 67.7% reported no symptoms, 12.0% reported no rectal partners in previous yr, 56.0% reported one partner, and 32% reported 2–4 partners. Only 16.0% reported having a new rectal partner in the last 3 months. Half (50.0%) reported never using condoms, 15.4% reported they always used condoms, 15.4% reported using condoms most of the time, and 19.2% reported using condoms some of the time.

Conclusions Public health officials should be aware that AI and rectal STIs are not uncommon among sexually active women. Future STI screening programs should consider rectal infections.

01-S07.03 PREVALENCE AND CORRELATES OF RECTAL CHLAMYDIA AND GONORRHOEA AMONG FEMALE STD CLINIC CLIENTS

doi:10.1136/sextrans-2011-050109.39

¹M Javanbakht, ²S Guerry, ²A Stirland, ³P Gorbach, ²P Kerndt. ¹University of California Los Angeles, Los Angeles, USA; ²Los Angeles County Department of Public Health, USA; ³University of California, Los Angeles, USA

Background The prevalence and correlates of rectal sexually transmitted infections (STI) are well described among men who report receptive anal intercourse (AI). However, very little is known about the epidemiology of rectal STIs among women.

Methods We conducted a cross-sectional study of women attending twelve public STD clinics in Los Angeles County, California. Women were eligible for inclusion in this study if they reported AI in the previous 90 days, were tested for rectal chlamydia (CT) and gonorrhoea (GC), and were seen between January 2008 and December 2009. Data collected included demographics, types of sexual contact, substance use, other risk behaviours, and STI results. Results Among the 716 females included in this analysis, the median age was 28 years (range 14–60), 40% were Hispanic, 37% African American, and 15% White. The prevalence of CT and GC by anatomic site was: 11.8% (n=83) urogenital CT, 14.2% (n=100) rectal CT, 2.7% (n=19) urogenital GC, and 3.0% (n=21) rectal GC. Among positives, 27% of CT cases and 27% of GC cases had rectal only infections. Among women ≥25 years the prevalence of rectal infections was higher among those incarcerated in the past year (39.4% vs 22.1%; p value=0.03) and those who reported sex with an injection drug user (50.0% vs 23.3%; p value=0.05). Among women >25 years the prevalence of rectal infections was higher among those with longer term sex partners (ie, >90 days; 12.6% vs 5.9%; p value=0.03), and those who reported substance use (14.8% vs 8.3%; p value=0.04). While the number of women with a rectal-only

infections (ie, no urogenital infection; n=33) was small, similar trends were observed. After controlling for age and race/ethnicity, among women ≥25 years those incarcerated in the previous year were more likely to have a rectal infection (adjusted OR [AOR]=2.55; 95% CI 1.14% to 5.71%). Among women >25 years, after controlling for race/ethnicity and age, those who reported substance use were more likely to have a rectal infection (AOR=2.28; 95% CI 1.14% to 4.55%) while those reporting new sex partners were less likely to have a rectal infection (AOR=0.38; 95% CI 0.16% to 0.88%).

Conclusion These findings highlight that the prevalence of rectal Chlamydia and gonorrhoea among women is similar to that of urogenital infections and a relatively large number of infections would be missed in the absence of rectal testing. Factors associated with rectal infections may differ by age.

01-S07.04 MANY MISSED STI WHEN ONLY TESTING UROGENITALLY WITHOUT SYSTEMATIC ANORECTAL AND OROPHARYNGEAL SCREENING IN SWINGERS AND MSM

doi:10.1136/sextrans-2011-050109.40

^{1,2}C Hoebe, ³G van Lier, ⁴A M Niekamp, ¹N Dukers-Muijers. ¹Department of Infectious Diseases, South Limburg Public Health Service, Maastricht University Medical Centre, School for Public Health and Primary Care Geleen, Netherlands; ²Department of Medical Microbiology, Maastricht University Medical Centre, School for Public Health and Primary Care Geleen, Netherlands; ³Department of Infectious Diseases, South Limburg Public Health Service Geleen, Netherlands; ⁴Centre for Sexual Health, Department of Infectious Diseases, Public Health Service South Limburg, Netherlands

Background Currently, risk groups are tested only urogenitally by most healthcare providers like general practitioners and STI clinics. Only on indication mostly guided by symptoms anorectal and/or oropharyngeal tests are performed. Patient identification and thereby adequate treatment and interruption of the chain of transmission can be hampered when patients are positive at another anatomic site than sampled for testing. It is unknown how large this potentially missed STI burden in healthcare is. In this study we assessed the burden of undetected STI in high risk heterosexuals (swingers) and men who have sex with men (MSM), based on systematic testing at three anatomical sites.

Methods All MSM and high risk heterosexuals that is, swingers, who as a couple have sex with other couples, were systematically screened for urogenital, anorectal and oropharyngeal STI at our STI Centre in 2010. This comprised 762 swinger consultations and 597 (non swinging) MSM consultations. One third of the male swingers reported to have sex with men. Prevalences of Chlamydia trachomatis (CT) and Neisseria gonorrhoea (NG), and STI (CT and/or NG) were calculated on multiple anatomical sites as well as the proportion of anorectal and oropharyngeal diagnosis that would have been missed if screened urogenital only.

Results Prevalences were 7% and 10% for CT, and 3% and 5% for NG in swingers and MSM, respectively (Abstract O1-S07.04 table 1). Of all anorectal CT in MSM 86% (n=42) was diagnosed without a urogenital CT, for NG this was 65% (n=11). Seventy-five per cent (n=6) of all oropharyngeal CT and 69% (n=11) of all oropharyngeal NG diagnoses would have been missed if MSM had been tested urogenital only. Prevalence of anorectal CT was higher than that of urogenital CT in female swingers. The proportions of missed anorectal diagnosis for CT were 50% (n=4) and 24% (n=5) for male and female swingers, respectively. No anorectal CT diagnosis was missed in male swingers, but in female swingers this was 67% (n=2). All oropharyngeal CT (n=6) and nearly all NG (91.7%, n=11) infections in swingers were diagnosed without a urogenital infection.