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

O1-S07.01 THE RELATIVE CONTRIBUTION OF ANAL INTERCOURSE AND PRIMARY INFECTION TO MATURE HETEROSEXUAL HIV EPIDEMICS

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M C Boily. *Imperial College, London, UK*

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

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.

O1-S07.02 CHARACTERISTICS OF WOMEN TESTING POSITIVE FOR RECTAL STIS USING SELF-COLLECTED MAILED SPECIMENS

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