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**Background** A frequently used HIV risk reduction method among men who have sex with men (MSM) is serosorting, which can be defined as a restriction of sexual partnerships to those who are of the same HIV serostatus. This partner selection strategy has been shown to reduce HIV transmission in epidemiological studies and mathematical models, but may lead to acquisition of other sexually transmitted infections (STI) including syphilis. We sought to evaluate the impact of HIV serosorting on syphilis prevalence, and to assess whether serosorting could account for an observed rise in syphilis incidence among MSM in San Francisco.

**Methods** A deterministic SIRS (susceptible-infectious-resistant-susceptible) model of syphilis transmission among HIV-negative and HIV-positive MSM was developed; model input parameters were based on epidemiological data from San Francisco between 1998 and 2004. The primary outcome was the impact of HIV serosorting on syphilis prevalence; we further evaluated the influence of HIV prevalence and average number of sexual partnerships on this serosorting effect.

**Results** Simulations showed that for base-case conditions, HIV serosorting increases syphilis transmission among HIV-positive and also among HIV-negative MSM so that syphilis could become endemic like in San Francisco. Only under very specific circumstances with high levels of serosorting among HIV-negative men can serosorting decrease syphilis prevalence. The size of the impact of serosorting on syphilis prevalence depends on HIV prevalence and partnership number.

**Conclusions** Our mathematical model adds evidence to the conclusion from an earlier ecological study suggesting that serosorting of HIV-negative and HIV-positive MSM may explain the increased syphilis incidence observed in San Francisco between 1998 and 2004. Our model results may have important implications for MSM not only in the US. Public health recommendations on HIV serosorting as an HIV harm reduction strategy should take into account the potential unintended consequence of increasing the prevalence of other STIs.

### P3.133 POTENTIAL HIV TRANSMISSIONS FROM INFECTED DRUG INJECTORS AND MEN WHO HAVE SEX WITH MEN IN SAINT PETERSBURG, RUSSIA

doi:10.1136/sextans-2013-051184.0592

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**Background** Less is known about HIV prevalence and incidence among men who have sex with men (MSM) in Saint Petersburg, Russia than in other large European cities, but it is clear that in that city the public health impact of HIV on drug injectors and their sex partners is remarkably high. We estimated the public health impact

**Methods** Respondent-driven sampling (RDS) yielded behavioural and HIV testing data and specimens for HIV antibody testing from 201 MSM who did not report injecting drugs and 691 drug injectors who did not report male-male sex. We estimated the potential for sexual HIV transmission from MSM and injectors unaware of their HIV infection, comparing unsafe encounters.

**Results** One quarter of people who inject drugs and 5% of MSM were HIV infected and unaware of their infection. Based on our prior estimate that there were 83,100 drug injectors living in Saint Petersburg; about 20,000 injectors are unaware of their HIV infection. If 1% of the general population are MSM, we estimate that

there are about 3,000 MSM with undiagnosed HIV infection in Saint Petersburg. The 169 injectors with undiagnosed infection reported unprotected sex with 37 partners who themselves injected drugs, and that the proportion of injectors who were uninfected was 56%. Injectors with undiagnosed infection reported unprotected sex with 26 partners who did not inject drugs; the uninfected proportion of non-injecting partners of drug injectors was 83%. Therefore, undiagnosed, HIV+ injectors exposed an estimated mean 0.25 uninfected partners in six months time. Those injectors expose 5,821 (95% CI 3,092–11,095) uninfected sex partners during a six-month period, whereas the 3,000 MSM with undiagnosed HIV infection in Saint Petersburg expose 4,800 (95% CI 4,320–12,000).

**Conclusion** New sexual infections emanating from MSM may become comparable to those from drug injectors.

### P3.134 THE AGE-SPECIFIC DISTRIBUTION OF GENITAL HUMAN PAPILLOMAVIRUS (HPV) INFECTION AND HERPES SIMPLEX VIRUS-2 (HSV-2) ANTIBODIES AMONG MEN WITH GENDER-FIXED AND GENDER-FLUID SEXUAL BEHAVIOUR: THE HIM STUDY

doi:10.1136/sextans-2013-051184.0593

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**Background** We investigated the age-specific distribution of genital HPV and HSV-2 antibodies among men whose sexual behaviour was confined either to men or to women (fixed) vs men whose sexual behaviour included both sexes (fluid). We hypothesised that fluid men may have more exposure to viral STIs.

**Methods** A total 4123 men from São Paulo, Brazil, Cuernavaca, Mexico, and Tampa, USA, aged 18–70 years, reported their sexual behaviour every six months for 2 years. Analysis was restricted to 1412 Brazilian men where fluidity had a much higher prevalence. Genital exfoliated cells for HPV PCR genotyping were collected every 6 months and blood for HSV-2 antibody testing was collected every 12 months. We used chi square and the Cochran-Armitage test to assess associations and age-specific linear trends.

**Results** Of 1292 men at enrollment who provided sexual behaviour information at ≥ 2 time points, those aged 17–24 reported the most fluidity (24%) and those aged 50–70 reported the least (16%) although the linear trend was not significant ( $p = 0.12$ ). After two years of follow up, HPV prevalence was comparable and stable by age among both fixed and fluid men for any HPV type, oncogenic types, and nononcogenic types. Prevalence of HSV-2 antibodies was higher among fluid than fixed men (65% and 59%, respectively) although not significantly different ( $p = 0.06$ ). The prevalence of HSV-2 antibodies increased by age among both fixed and fluid men ( $p$  for trend  $< 0.0001$  and  $= 0.0006$ , respectively).

**Conclusions** These data suggest that fluidity is not associated with increased prevalence of HPV and HSV-2. There was no trend for genital HPV by age which might be expected of a highly prevalent viral infection that often escapes immune surveillance; however, age was associated with HSV-2 antibodies as would be expected of a highly prevalent viral infection that less often escapes immune recognition.

### P3.135 HIGH PREVALENCE, INCIDENCE AND CLEARANCE OF ANAL HIGH-GRADE SQUAMOUS INTRAEPITHELIAL LESIONS (HSIL): EARLY EVIDENCE FROM A NATURAL HISTORY STUDY IN HOMOSEXUAL MEN

doi:10.1136/sextans-2013-051184.0594