

Abstract O1-S02.02 Table 2 Unadjusted and adjusted estimates of HPV detection on incidence of other STIs (total number of visit pairs=3221)

	Detected with the following at previous visit	New cases of other STIs, n=46 (1.4%) n (row%)	New detection of other STIs across consecutive visits	
<b>Any HPV</b>				
No	2590 (80.4)	31 (1.2)	1.0	1.0
Yes	631 (19.6)	15 (2.4)	<b>1.94 (1.05 to 3.58)</b>	1.81 (0.94 to 3.49)
		<b>New cases of other STIs, n=46 (1.4%) n (row%)</b>	<b>New detection of other STIs across consecutive visits</b>	
<b>Any HR-HPV</b>				
No	2930 (91.0)	38 (1.3)	1.0	1.0
Yes	291 (9.0)	8 (2.7)	2.14 (1.00 to 4.61)	2.00 (0.82 to 4.83)

Estimates adjusted for age and study site at enrolment, as well as the following covariates assessed at each follow-up visit: pap smear diagnosis at previous visit, contraceptive use in last 6 months, number of lifetime partners, partners having sex with others in last 6 months, having new partner in last 12 months, male partner using condom in last 6 months. Covariates that were found to be statistically significantly associated with the outcomes ( $p < 0.05$ ) and/or significantly influence the effect size of the primary association of interest ( $\geq 10\%$ ) were included in the final models for confounding control. Parity, smoking status, and other factors measured, such as age of sexual debut and frequency of sex in last 6 months, did not satisfy these criteria in the data analyses and hence were not included in the final models.

HPV, human papillomavirus; HR-HPV, High-risk HPV, defined as HPV types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 (IARC 2007); STIs, sexually transmitted infections.

**Methods** Women aged 20–38 years were followed semi-annually for 18 months in Thailand ( $n=1200$ ). Assessment was made on cervical HPV genotypes, cervical cytology, sexual behaviour, demographic factors and diagnoses of other STIs including chlamydia, gonorrhoea, syphilis, genital herpes and trichomoniasis. Incident detection was defined as any type-specific HPV or other STI which was detected at current visit but not at previous visit. Associations were measured by ORs with 95% CIs estimated in generalised estimating equation models.

**Results** During follow-up, 241 new cases of HPV, 110 incident cases of high risk (HR)-HPV and 46 new cases of other STIs were observed. Diagnosis of other STIs at previous visit was statistically significantly associated with twofold increased odds of any new HPV detection after controlling for sexual behaviour, age, pap smear status and contraceptive use [adjusted OR (aOR): any HPV: 2.16 (95% CI: 1.08% to 4.34%)] (Abstract O1-S02.02 table 1). No significant association was found between diagnosis of other STIs and subsequent incident detection of HR-HPV [aOR: 2.01 (95% CI: 0.74% to 5.48%)] (Abstract O1-S02.02 table 1). Positive detection of any HPV or HR-HPV predicted nearly twofold increased odds of other STIs with the estimates bordering on statistical significance [aORs: any HPV: 1.81 (95% CI: 0.94% to 3.49%); HR-HPV: 2.00 (95% CI: 0.82% to 4.83%)] (Abstract O1-S02.02 table 2).

**Conclusions** We show that other STIs increase the risk of HPV incidence after controlling for sexual behaviour. The data qualitatively suggest mutual associations of HPV with other STIs. Further studies are warranted to evaluate if these reflect true biologic interactions between HPV and other sexually transmitted microbial agents, or mere confounding from unmeasured sexual risks.

**O1-S02.03 MULTIPLE SEX PARTNERS AND LACK OF CONDOM USE FOR ANAL SEX ARE ASSOCIATED WITH MULTIPLE ANAL HPV INFECTIONS AMONG MEN HAVING SEX WITH MEN: THE HIM STUDY**

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<sup>1</sup>A Nyitray, <sup>2</sup>L L Villa, <sup>3</sup>R J Carvalho da Silva, <sup>2</sup>M L Baggio, <sup>1</sup>B Lu, <sup>1</sup>D Smith, <sup>1</sup>M Abrahamsen, <sup>1</sup>M Papenfuss, <sup>4</sup>E Lazcano-Ponce, <sup>1</sup>A R Giuliano, <sup>1</sup>H. Lee Moffitt

Cancer Center and Research Institute, Tampa, USA; <sup>2</sup>Ludwig Institute for Cancer Research, São Paulo, Brazil; <sup>3</sup>Centro de Referência e Treinamento em DST/AIDS, São Paulo, Brazil; <sup>4</sup>Instituto Nacional de Salud Pública, Cuernavaca, Mexico

**Background** Human Papillomavirus (HPV) infection is the primary cause of anal cancer. While multiple HPV infections in the anal canal may accelerate disease progression, there are no reports of behavioural factors associated with multiple anal HPV infections among men having sex with men (MSM) and men having sex with women (MSW). We hypothesised that infection with multiple HPV types in the anal canal among MSM was associated with multiple sex partners and lack of condom use for recent anal sex. For comparison, we also assessed the role of multiple partners and condom use among MSW.

**Methods** Genotyping for 37 HPV types was conducted on anal canal exfoliated cell specimens from men, ages 18–70, from São Paulo, Brazil; Cuernavaca, Mexico; and Tampa, Florida, USA. Specimens from the pre-enrolment visit of a 4-year prospective study were analysed. Eligibility included no history of genital warts and no current STD diagnosis including HIV. Exfoliated cell samples between the anal verge and the dentate line of the anal canal were obtained with a saline-wetted swab. A total of 193 MSM and 1407 MSW provided evaluable specimens. For multivariable analyses we used Poisson regression with a robust sandwich estimator. Association estimates were adjusted for potential confounders.

**Results** Multiple HPV infections were present in the anal canal of 34.7% of MSM and 4.0% of MSW. Prevalence of multiple HPV infections was stable by age group among MSW ( $p$  trend=0.65) but declined among MSM ( $p$  trend=0.009). After adjustment for potential confounders,  $\geq 2$  male anal sex partners in the past 3 months (OR 2.47, 95% CI 1.43% to 4.27% vs 0–1 men) and lack of condom use at last anal sex (OR 1.51, 95% CI 1.07% to 2.12% vs condom use) were associated with detection of multiple anal HPV infections among MSM. Among MSW,  $\geq 2$  female sex partners in the past 6 months (OR 1.81, 95% CI 1.02% to 3.21% vs 0–1 women) was associated with detection of multiple anal HPV infections while condom use at last vaginal sex was not associated with infection (no condom use: OR 0.90, 95% CI 0.51% to 1.61% vs condom use).

**Conclusions** These data suggest that lowering the number of sex partners may reduce infection with multiple HPV types at the anal canal among MSM and MSW. Additionally, using condoms during anal sex among MSM, even among men with multiple partners, may reduce multiple anal HPV infections at the anal canal. Questions:alan.nyitray@moffitt.org

**O1-S02.04 EVIDENCE OF HPV VACCINE EFFECTIVENESS IN REDUCING GENITAL WARTS: AN ANALYSIS OF CALIFORNIA PUBLIC FAMILY PLANNING ADMINISTRATIVE CLAIMS DATA, 2007–2009**

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H Bauer, G Wright, J Chow. Department of Public Health, Richmond, California, USA

**Background** The quadrivalent HPV vaccine, available in the US since 2006, is recommended for females age 9–26. This vaccine prevents HPV types 6 and 11, which cause 90% of genital warts (GW). Because of the rapid development of GW after infection, monitoring GW trends may provide early evidence of population level vaccine effectiveness.

**Methods** Trends in GW diagnoses were assessed using clinical encounter claims data from the California Family Planning Access Care and Treatment program which serves low-income females and males. Following implementation of diagnostic coding requirements, reliable data on International Classification of Diseases