

non-specific reactivity on HIV Western blot. Specificity and NPV for the antibody component was 99.5% (99.0–99.7) and 99.9% (99.6–100.0) and for the antigen component was 99.8% (99.4–99.9) and 99.6% (99.1–99.8), respectively.

**Conclusion** Antibody and antigen component specificity was consistent with the rapid test package insert; whereas sensitivity was lower, notably in those with recent infections. Hence, identifying patients at risk of recent infection is vital so that conventional laboratory serology is performed. A formal assessment of test performance in seroconvertors is warranted.

#### 015.5 PERFORMANCE CHARACTERISTICS OF SD BIO LINE RAPID HIV-SYPHILIS DUO TEST KIT FOR SIMULTANEOUS DETECTION OF HIV AND SYPHILIS INFECTIONS

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**Background** Human immunodeficiency virus (HIV) and *Treponema pallidum* share modes of transmission. Congenital syphilis is a significant cause of stillbirth, prenatal death and serious neonatal infections. We sought to evaluate rapid test kit for HIV-syphilis dual detection to improve diagnosis and enable accurate management towards achieving the renewed zeal of eradicating syphilis and congenital syphilis.

**Methods** Six hundred and eighty serum specimens from HIV discordant couples in a clinical trial, tested for syphilis infection by RPR with reactive specimens confirmed by TPHA, were used for this evaluation. HIV status was determined by Uni-Gold™ and Determine™ HIV rapid kits and all positive samples confirmed by two HIV Enzyme immunoassay test. These specimens were blindly retested using the HIV-Syphilis Duo kit.

**Results** Of 698 samples evaluated 139 (20%) were RPR positive and 346 (50%) were HIV positive. Among the RPR positive, 85 (61%) were TPHA positive. None of 559 RPR negative samples tested syphilis positive on HIV-Syphilis Duo kits. Of the 85 RPR positive-TPHA positive samples, none tested syphilis negative on the HIV-Syphilis Duo kit. All RPR positive-TPHA negative samples tested syphilis negative on the HIV-Syphilis Duo kit. Sensitivity and specificity was: both 100% for syphilis detection and; 99.71% and 100% respectively for HIV detection. On this sample set the Sensitivity of Determine™ and Uni-Gold™ was 96.82% and 98.27% respectively while the Specificity was 93.75% and 99.43% respectively. HIV-Syphilis Duo kit detected 5 early HIV infections that were missed out by Determine™ and Uni-Gold™ at least one month prior to a seroconversion visit.

**Conclusion** HIV-Syphilis DUO test kit performed better compared to RPR for syphilis and Determine™ for HIV detection. It was equivalent to TPHA for syphilis and Uni-Gold™ for HIV detection. Its implementation in antenatal clinics/VCTs will present an added opportunity for simultaneous diagnosis of HIV and syphilis.

#### 015.6 MOLECULAR SURVEILLANCE OF NEISSERIA GONORRHOEAE PENICILLIN RESISTANCE: INFORMING EMPIRIC PRESCRIBING POLICY IN WESTERN AUSTRALIA

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Against the worldwide trend, there remain populations in the remote regions of Western Australia (WA) where the efficacy rates for penicillin may be above the World Health Organisation (WHO)

95% guideline for *N. gonorrhoea* drug selection. Oral amoxicillin (3g) with probenecid (1g) is used empirically in these regions. The majority of gonorrhoea diagnoses in our laboratory are performed by PCR with culture-based antimicrobial resistance surveillance limited by the lack of a representative number of isolates. We therefore implemented a world-first comprehensive molecular gonococcal surveillance of penicillin resistance in our remote populations.

We tested all *N. gonorrhoeae*-PCR positive cases from August 2011 to July 2012 (n = 1235) using a PCR assay targeting the penicillinase-producing *N. gonorrhoeae* (PPNG). This represented approximately 60% of the 2092 notified WA gonorrhoea cases but 91% of cases from the remote regions. Of these regions, the Kimberley PPNG rate was 0.7%, the Pilbara 4.0%, the Goldfields 10.3%, and the Mid West 0% compared to Perth, the state capital city with 12(8–16)%. When adjustments were made for chromosomal-mediated penicillin resistance (additional 3.4%), the Kimberley and Mid West regions remained below the 5% WHO resistance threshold for penicillin. In addition, a review of the Pilbara and Goldfields regions found PPNG only in the major regional centres.

Based on this data, continuation of amoxicillin with probenecid in the Kimberley region with its reintroduction into the Mid West was recommended. In the Pilbara and Goldfields amoxycillin with probenecid could be continued in remote communities but empiric treatment in the regional centres and of non-locals should employ intramuscular ceftriaxone therapy, as for other parts of WA. Our study shows that molecular surveillance of gonococcal antimicrobial resistance directly from clinical specimens is feasible and could be extended to include other targets conferring resistance to other antibacterials such as ceftriaxone.

### 0.16 - STI-Potpourri: Chlamydia, HPV and special populations

#### 016.1 THE BEHAVIOURAL IMPACT OF CHLAMYDIA TESTING AND ATTITUDES TOWARDS TESTING AMONG YOUNG ADULTS IN ENGLAND

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**Background** In England, the National Chlamydia Screening Programme aims to control chlamydia infection in young adults (aged 15–24 years old) through opportunistic testing. This study aimed to investigate the impact of testing on young adults' subsequent healthcare seeking and sexual behaviour. Young adults' attitudes to chlamydia and chlamydia testing are important barriers to screening, and thus questions on attitudes to testing and reasons for not testing were included.

**Methods** A cross-sectional web-based anonymous survey of 1,521 young adults aged 16–24 resident in England was conducted using a nationally representative research panel. The impact of chlamydia testing on subsequent behaviour, and attitudes towards chlamydia testing, were assessed by asking respondents to use a Likert scale to score how well they agreed with a series of statements.

**Results** Just under half (46%; 695/1,521) of respondents had been tested for chlamydia previously: of whom 14% (94/695) reported ever having received a positive result. Those tested (n = 695) reported a positive impact on subsequent healthcare seeking behaviour (e.g. 68% agreeing that they were more likely to test again), and a smaller impact on sexual behaviour (e.g. 40% agreeing that they were more likely to use condoms consistently). Having positive attitudes towards chlamydia testing was associated with a higher likelihood of having been tested (OR 4.9; 95% CI 3.9–6.1). Of those sexually active but not tested (32%; 488/1,521), 70% did not consider themselves to be at risk.

**Conclusions** Young adults reported that being tested for chlamydia had a positive impact on their willingness to engage with future testing, and a smaller impact on subsequent sexual behaviour. The use of online surveys is warranted as the results were comparable to those of nationally representative population based surveys. Addressing young adults' underlying attitudes towards testing and perceptions of risk could increase their willingness to test for chlamydia.

## 016.2 STRAIN TYPING TO RESOLVE REPEATED CHLAMYDIA TRACHOMATIS INFECTIONS IN YOUNG HETEROSEXUAL DUTCH POPULATIONS

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Repeated infections of *Chlamydia trachomatis* (CT) occur frequently in young adults. These may be new infections, or persistent infections due to treatment failure or unresolved infections in sex partners. We compared CT multilocus sequence typing (CT-MLST) to *ompA* genotyping in discriminating new from persistent Chlamydia infections. Samples from young heterosexual persons were selected from Dutch screening implementation studies in Amsterdam and Rotterdam, the Netherlands, between 2009 and 2011. Paired CT positive samples at baseline (T0) and after 6 months (T1) were genotyped with 6 MLST loci which included: *ompA*, CT046, CT058, CT144, CT172 and CT682. The uniqueness of Chlamydia strains was assessed by adding samples from 256 heterosexuals in Amsterdam.

For 27 out of 34 persons with repeated infections, full MLST types were obtained for paired samples. In 17 of these 27 persons a multilocus (n = 13) or single locus variant (n = 4) was found, indicating new CT infections at T1. For 5 MLST discordant participants, the *ompA* genovar was identical. The 10 persons with concordant typing results were categorised as treatment failure (5 persons) or unresolved infections (5 persons). A minimum spanning tree, generated from all cases and 256 reference samples showed large and small clusters and singletons. Surprisingly, the persons with concordant samples had CT strains that were either unique (singleton) or found in small clusters. The median time between T0 and T1 did not differ between the persons with concordant and discordant samples. The number of sex partners before T0 however, was higher for the discordant group. High resolution sequence typing was superior compared to *ompA* typing in discriminating new from persisting Chlamydia infections. Many persons (37%) showed exactly the same Chlamydia strain after 6 months indicating possible treatment failure.

## 016.3 CONTROLLING CHLAMYDIA: POPULATION MODELING TO ASSESS PROMISING INTERVENTIONS

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**Background** Chlamydia is an important public health problem associated with neonatal sequelae, pelvic inflammatory disease, infertility, and ectopic pregnancy.

**Methods** Using a population model with 2 genders and ages 15–44 years in 5-year groups, but only heterosexual contacts, we evaluated the impact of actual and hypothetical interventions on chlamydia in the U.S. Parameters were obtained from the literature or estimated from the National Health and Social Life Survey and Seattle Sex Survey. The model was calibrated by adjusting gender-specific probabilities of infection on contact. We calculated the basic reproduction

number ( $R_0$ ), defined as the average number of secondary infections per infectious person in a wholly-susceptible population without interventions. We also calculated the age- and gender-specific equilibrium prevalence and contributions to  $R_0$ . And we assessed the impact of interventions by comparing reproduction numbers with and without them. To assess the feasibility of opportunistic screening, we analysed Market Scan, a commercial health insurance database, to determine the proportion of people seeking medical care.

**Results** Treating symptomatic men and women who seek care and screening 38% of women aged 15–24 years during annual examinations more than halve the reproduction number. The equilibrium age- and gender-specific prevalence of infection match those observed in the National Health and Nutrition Examination Survey. Men cause more secondary infections than women (contributing twice as much to  $R_0$  in some age groups), and people aged 25–29 years cause as many as those aged 20–24. Analysis of the Market Scan database indicates that insured men seek care often enough for screening to have substantial impact. Screening women reduces the reproduction number by 3%; screening a similar proportion of young men would reduce it another 4%.

**Conclusions** Our modelling suggests that screening men as well as women and extending the upper age to 29 years may affect chlamydia transmission or sequelae.

## 016.4 HUMAN PAPILLOMAVIRUS IN VERY YOUNG MEN WHO HAVE SEX WITH MEN AND THE POTENTIAL BENEFIT FROM VACCINATION

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**Background** Homosexually active men are at increased risk for human papillomavirus (HPV) infection and HPV associated anal cancer. Prophylactic HPV vaccines have maximum efficacy in people who have not already been infected with HPV. This study aims to determine the prevalence of HPV among teenage MSM.

**Methods** Same sex attracted males aged 16 to 20 were recruited in Melbourne via clinics, universities, community events, media, social networking and peer recruitment. At baseline, 3, 6, and 12 months anal and penile swabs and an oral rinse were obtained to test for 37 HPV genotypes.

**Results** 200 men were recruited. At baseline 39% had at least one type of HPV DNA detected from at least one site. High risk (HR), low risk (LR) and quadrivalent vaccine (QV) preventable types were detected in 31% (95% CI: 25–37%), 30% (95% CI: 24–37%) and 23% (95% CI: 17–29%) of men respectively. Multiple types of any, HR, LR and QV preventable HPV were detected in 27%, 13%, 11% and 8% of men respectively. The site specific prevalence of any HPV detected from the oral cavity, penis and anus were 2%, 9% and 31% respectively: the prevalence of QV preventable types at these 3 sites was 0.5%, 4% and 20% respectively. Anal HPV was absent in 27 of 30 men who reported never receiving anal sex. Additional results of serology for HPV 6/11/16 and 18 will also be presented.

**Conclusion** In this study, the first to focus on early HPV acquisition among teenage MSM, HPV was common but in the minority. HPV vaccination prior to the onset of sexual activity is ideal; however, short of universal vaccination of school aged males, selected vaccination of teenage same sex attracted young men could still prevent many infections.