

**Background** HIV prevalence studies have found that male sex workers (MSWs) in China have high HIV prevalence, ranging from 5% to 9%. These “money boys” have been identified as a particularly vulnerable population, and it is imperative to develop effective programmes for HIV prevention in this population.

**Objectives** The study had 4 objectives: (1) to describe the operation of the male sex work industry; (2) to identify the environmental and structural factors that shape the risk practises of MSWs (3) to map solicitation venues and estimate the size of the MSW population to guide programme design and focus.

**Method** Ethnographic and geo-mapping techniques were combined to locate, enumerate and contextualise different aspects of the male sex trade industry. MSWs, network operators and brothel owners provided size estimates of MSWs for specific hotspots. Participant observation and key informant interviews were employed to understand the risk practises described by participants.

**Results** According to the ethnographic findings, MSWs are often recruited from rural villages via labour markets and from the urban gay community; they had high client volumes and were mobile within the city and between cities throughout China. Thirty MSW venues were mapped and 23 venues were validated. Systematic review and validation of gay websites revealed 48 brothels. Local prevention programmes reached only 16 venues. Five public toilets, 4 bathhouses and 7 parks, where MSWs frequented, were also mapped. The majority of venues were located within the commercial core, with easy access to public transportation. The MSW population was estimated between 373 and 1200. Some MSWs (n = 97) advertised on gay websites and through cell phone applications.

**Conclusion** Despite criminalization, there is a thriving male sex trade in Chengdu. Local efforts to reach these communities need to be scaled up to address programme coverage gaps.

**013.5 THE HIV MODES OF TRANSMISSION MODEL: A SYSTEMATIC REVIEW OF ITS FINDINGS AND ADHERENCE TO GUIDELINES**

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**Background** The HIV Modes of Transmission model (MOT) estimates the annual percentage distribution of new HIV infections (PNI) by key risk groups. It was designed to guide country-specific HIV prevention policies. To determine if the MOT produced context-specific recommendations, we analysed the MOT results by regions and epidemic types and explored the factors (e.g. data inputs, adherence to guidelines) influencing the differences.

**Methods** We systematically searched MEDLINE, EMBASE, UNAIDS reports, and contacted UNAIDS country directors for published MOT results from 2003 (1st published MOT).

**Results** We included 4 journal articles and 20 UNAIDS reports covering 29 countries. The largest PNI was among the low-risk group (one heterosexual partner) in 13 countries [range 26–63%], and increased with low-risk population size. The estimated PNI among female sex workers (FSWs) was universally low [median 1.3%, range 0.04–14.4%], and showed little variability by region and epidemic type despite variation in sexual behaviour e.g. number of partners. In India and Thailand, where FSWs play an important role in transmission, the PNI among FSWs was 2% and 4% respectively. In contrast, the PNI among men who have sex with men (MSM) varied across regions [MSM, range 0.1–89%] and increased with MSM population sizes. The PNI among people who inject drugs [PWID, range 0–82%] was largest in ‘early-phase’ epidemics with low overall HIV prevalence. Most MOT studies are being conducted and reported as per guidelines. However, many countries (n = 23)

reported data limitations - especially on high-risk groups - when parameterising the MOT.

**Conclusion** Although countries are generally performing the MOT as per guidelines, results showed little variation in MOT outputs (except MSM and PWID) by regions and epidemic types. Homogeneity in MOT outputs for FSWs, clients and low-risk population may limit the utility of MOT for guiding country-specific interventions in heterosexual HIV epidemics.

**013.6 FOCUSING THE DELIVERY OF THE ENGLISH NATIONAL CHLAMYDIA SCREENING PROGRAMME: EXPLORING OPPORTUNITIES TO EXPAND TESTING WITHIN LOCAL SERVICES**

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**Background** The National Chlamydia Screening Programme (NCSP) seeks to increase rates of chlamydia diagnosis amongst young people aged 15–24 across the 326 English Local Authorities (LA). 68% of screens and 79% of diagnoses are made in the community sexual health, general practise, pharmacy, termination of pregnancy (TOP) and genitourinary medicine (GUM) services that take part in the NCSP. These ‘Core Services’ are central to the delivery of the programme but not all clinics screen for chlamydia. This study was undertaken as part of a project to inform optimum services configuration to increase diagnostic rates to improve chlamydia detection and infection control.

**Methods** Diagnoses of genital chlamydia recorded in data from sexually transmitted disease clinics and NCSP surveillance datasets for 2011 were aggregated to LA level. Overall diagnostic rates (outcome) were calculated using Office of National Statistics (ONS) population estimates for the 15–24 year age group. This information was analysed together with the total testing at each Core Service and ONS area classification. Data were analysed using multivariable negative binomial poisson regression and spatial mapping techniques.

**Results** Overall chlamydia diagnostic rates were associated with increased rates of testing in community health services (RR = 1.02; p < 0.0001), general practise (RR = 1.01; p = 0.0176) and GUM (RR = 1.03; p < 0.0001) but not pharmacy or TOP. Diagnostic rates varied by geographic location (p < 0.0001), lower rates being seen in ‘Central London’ (RR = 0.63; 95% CI = 0.50–0.80), ‘London Suburbs’ (RR = 0.77; 95% CI = 0.61–0.96) ‘Southern England’ (RR = 0.63; 95% CI = 0.51–0.78) and ‘Outer London’ (RR = 0.64; 95% CI = 0.50–0.81). Diagnostic rates also increased as the range of service types contributing to testing increased (p = 0.0427).

**Conclusions** The analysis highlights the importance of community based testing and the provision of a range of services to achieving high rates of chlamydia detection. The study is being extended to investigate patient flow and service attendances within and between LAs in relation to gender, age group, ethnicity and service type.

**0.14 - Clinical syndromes**

**014.1 BACTERIAL VAGINOSIS-ASSOCIATED BACTERIA (BVAB) AND NON-GONOCOCCAL URETHRITIS (NGU)**

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**Background** Traditional cultivation approaches have not identified additional pathogens responsible for the 45% of non-gonococcal

urethritis (NGU) cases with no identified aetiology. Cultivation-independent methods have identified novel bacteria associated with female reproductive tract disease, particularly bacterial vaginosis (BV). We evaluated the association of NGU and 5 newly described BV-associated bacteria (BVAB).

**Methods** English-speaking, heterosexual men aged 16 years attending the STD clinic in Seattle, WA between May 2007 and July 2011 were eligible if PCR tests for *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Trichomonas vaginalis*, *Mycoplasma genitalium*, and *Ureaplasma urealyticum*-biovar2 were negative. Cases were men with visible urethral discharge or 5 PMNs/HPF in urethral exudates. Controls were men with no visible urethral discharge and < 5 PMNs/HPF. Urine was tested for *Atopobium*, BVAB-2, BVAB-3, *Megasphaera spp.*, and *Leptotrichia/Sneathia spp.* using quantitative taxon-directed PCR.

**Results** Cases (n = 157) and controls (n = 191) were similar with respect to age, education, and income. Mean age was 34.7 (SD ±9.9) and most were white. *Leptotrichia/Sneathia* was significantly associated with NGU (25/157 (15.3%) vs. 6/102 (5.9%), p = 0.03) and BVAB-2 was detected more often in cases than controls (7/157 (4.5%) vs. 1/102 (1.0%), p = 0.15). BVAB-3 (n = 2) and *Megasphaera* (n = 1) were uncommon, but only detected in men with NGU. In contrast, *Atopobium* was not associated with NGU (8.3% vs. 7.8%, p = 1.0). Quantity of bacteria did not differ between cases and controls for any of the 5 candidate pathogens. Among treated cases, doxycycline was somewhat more effective than azithromycin for clinical cure of men with *Leptotrichia/Sneathia* (9/10 (90%) vs. 7/12 (58%), p = 0.16), and BVAB-2 (3/3 (100%) vs. 0/3 (0%), p = 0.10).

**Conclusion** *Leptotrichia/Sneathia* was significantly associated with NGU. BVAB-2, BVAB-3, and *Megasphaera* were less commonly detected, but most often identified in men with NGU and rarely or never in men without NGU. Doxycycline may be more effective against these newly identified bacteria than azithromycin.

**014.2 PREDICTORS AND PATHOGENS AMONG 4,326 CASES OF ACUTE NON-GONOCOCCAL URETHRITIS**

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**Background** This large series examines the behavioural, demographic and laboratory characteristics and pathogens among males with first presentation of acute NGU.

**Methods** Retrospective review using the electronic-medical record database of Melbourne Sexual Health Centre, Australia, from January 2006 to December 2011. Cases were men with their first presentation with symptoms of acute NGU, in this period. First-stream urine was routinely tested for *C.trachomatis* and *M.genitalium* by PCR, and selectively tested, for trichomoniasis by culture, and HSV-1/2, and adenoviruses by PCR. We examined characteristics of cases, stratifying by pathogen, pathogen-clusters and sexual preference.

**Results** Of 5452 cases of acute NGU during the study period, 4326 (79%) first presentations were included. 799(18.5%) had *C.trachomatis*, and 264(6.0%) *M.genitalium* detected. Of cases tested selectively on clinical grounds: 28/70 had adenovirus, 31/85 HSV-1/2 and 2/50 trichomoniasis. The majority (74.5%) had no pathogen-detected. Cases with bacterial-STIs were more likely than cases with viruses to have ≥ 5 PMNL/HPF on urethral Gram-stain (62.6% vs 31.5%), p < 0.001. Cases with viruses or no pathogen detected, were more likely to report unprotected oro-genital sex as their only exposure (10.3% & 10%, respectively) compared to cases with bacterial-STIs (5.2%), p < 0.001. Compared to heterosexuals, men who have sex with men (MSM) were less likely to have a bacterial-STI (OR = 0.5; 95% CI: 0.4–0.6, p < 0.001), more likely to have no

pathogen-detected (OR = 1.9; 95% CI: 0.1.6–2.3, p < 0.001), and to report 100% condom-use (OR = 4.1; 95% CI: 3.5–4.9, p < 0.001).

**Conclusion** Compared to heterosexual men, MSM were less likely to have *C.trachomatis* and *M.genitalium* and more likely to have no pathogen detected in acute NGU. Cases with viral agents and pathogen-negative cases were significantly more likely to report unprotected oral sex as the only exposure, raising the possibility that other oropharyngeal pathogens may have an aetiological role in acute NGU. The urethral Gram stain cut off ≥ 5 PMNL/HPF fails to detect a significant proportion of cases with bacterial and viral pathogens.

**014.3 LONG-TERM EFFICACY OF HUMAN PAPILLOMAVIRUS VACCINATION AGAINST CERVICAL CANCER**

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Human papillomavirus (HPV) vaccination trials have shown high efficacy (VE) against high grade cervical intraepithelial neoplasia (CIN2/3). CIN2/3 is a surrogate marker of invasive cervical cancer (ICC). These lesions may spontaneously regress. Therefore, long-term follow-up is needed to determine the overall VE against ICC. Between September 2002 and March 2003, 1,749 16- to 17-year old women from Finland were enrolled in the randomised FUTURE trial of the quadrivalent HPV vaccine (Gardasil) with active follow-up for 4 years. Passive follow-up using the population-based Cancer Registry started 6 months after the active follow-up ended in 2007. A cluster randomised, population-based reference cohort of 15,744 unvaccinated, 18–19 year old women was established. We linked these cohorts to compare the incidence rates of CIN3 and ICC. Passive follow-up after 4 years resulted in 3,464, 3,444 and 62,876 person years of follow-up for the HPV vaccinated cohort, the placebo vaccinated cohort and the reference cohort, respectively. The number of endpoints with CIN3 or ICC identified were 0 and 0, 3 and 0, and 59 and 3 for the three cohorts, respectively. The corresponding incidence rates were 0 (95% confidence interval 0.0–106.5), 87.1 (95% CI 17.9–254.5) and 93.8 (95% CI 71.4–121), respectively. Our study shows that evaluation of the long-term efficacy post vaccination for the most stringent endpoints is feasible using cancer registries.

**014.4 MICROBIOLOGIC AETIOLOGY OF PROCTITIS DIAGNOSED IN AN URBAN STD CLINIC**

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**Background** Sexually transmitted proctitis occurs among persons who participate in receptive anal intercourse and is a risk factor for HIV acquisition. *N. gonorrhoeae*, *C. trachomatis* (including LGV), *T. pallidum*, and Herpes Simplex Virus (HSV) are the most common pathogens identified. The distribution of microbiologic aetiology of proctitis has implications for empiric treatment guidelines. **Methods:** We describe the microbiologic aetiology of clinical proctitis among men who have sex with men seen at the municipal STD clinic in San Francisco. *N. gonorrhoeae* and *C. trachomatis* were tested using a nucleic acid amplification assay, HSV was tested using polymerase chain reaction, and *T. pallidum* was tested using a non-treponemal antibody test, with *T. pallidum* particle agglutination confirmation. **Results:** Between January 1, 2004 and December 31, 2012, there were 1271 men diagnosed with clinical proctitis at the clinic. The number of cases of proctitis diagnosed annually did not increase over this interval, despite