

counselling and partner notification. Combination POCTs for HIV and syphilis are particularly beneficial for pregnant women and key populations as treating these infections early reduces vertical and community transmission.

Methods We evaluated Standard Diagnostics' Duo HIV and Syphilis Test (SD bioline) among female sex-workers (FSW) in the inner-city of Johannesburg. SD bioline was conducted on-site using whole blood according to manufacturer's instructions and compared to Genscreen HIV 1/2 V2 – 3rd and Vironostika Ag/Ab – 4th generation assays for HIV and to the *T. pallidum* particle agglutination (TPPA) test for syphilis. A Rapid Plasma Reagin (RPR) test was conducted in the laboratory to assist with classification of treponemal disease. Sensitivity, specificity, positive predictive values (PPV) and negative predictive values (NPV) were calculated

Participants with HIV were referred to HIV services and those with syphilis were managed according to national guidelines. The study received ethics approval.

Results We recruited 263 FSW, 14 (5.3%) declined an HIV test and were excluded. Among the remaining 249 FSW 187 (75.1%) women were HIV positive and 51 (20.5%) had evidence of syphilis with 7 (2.8%) having active syphilis. For HIV sensitivity was 98.9% (95% CI: 95.8–99.8), specificity was 100% (95% CI: 92.7–100), PPV was 100% (95% CI: 97.5–100%) and NPV was 96.9% (95% CI: 88.2–99.5). For treponemal antibody detection, sensitivity was 66.7% (CI: 52.0–78.9), specificity was 98.0% (CI: 94.5–99.3), PPV was 89.5 (CI: 74.3–96.6) and NPV was 91.9% (CI: 87.2–95.1). Sensitivity increases to 85.7% for active syphilis (RPR > 1:4).

Conclusion Although the SD bioline performs well for HIV diagnosis, the assay has lower sensitivity for syphilis detection in our field setting compared to published laboratory evaluations. Using the test in screening programmes will detect both HIV and active syphilis but will result in overtreatment for syphilis.

Disclosure of interest statement The study was funded by USAID/PEPFAR and AIDS Fonds. SD bioline tests were provided by SD diagnostics.

002.5 EVALUATION OF FIVE RAPID POINT-OF-CARE TESTS FOR SYPHILIS: TWO TREPONEMAL ONLY, AND THREE DUAL TREPONEMAL/HIV ASSAYS

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Background Traditional syphilis and HIV screening strategies require laboratory capacity which is often limited in resource-poor settings. Affordable rapid point-of-care tests (RPOCT) with high sensitivity and specificity would allow same-day testing and referral for treatment of syphilis and HIV in pregnant women. This would allow a decrease in adverse outcomes as a result of mother-to-child transmission (MTCT). We compared test performance of two RPOCT treponemal tests and three combination treponemal/HIV tests for detection of treponemal antibodies in sera; and we also examined test performance of the three RPOCT treponemal/HIV tests for detection of HIV antibodies in sera.

Methods We tested banked sera previously characterised for syphilis (n = 1186), from San Francisco Department of Public Health, Kaiser Permanente Northern and Southern California, and 437 known HIV-positive samples (CDC HIV), according to manufacturer's insert with 3 dual HIV/Syphilis RPOCT: SD BIOLINE HIV Syphilis Duo (Standard Diagnostics), Multiplo TP/HIV (MedMira) and DPP HIV-syphilis Assay (Chembio), and 2 treponemal-only tests: SD Syphilis 3.0 (Standard Diagnostics), Determine SyphilisTP (Alere). Positive agreement across tests was determined and RPOCT results were compared to prior test results.

Results The 5 assays had concordant positive result of 84% (1362/1623) for treponemal antibodies, and 96.6% (1569/1623) for HIV antibodies. Compared to previously reported results, treponemal tests had sensitivities and specificities of; SD 3.0 – 72%, 97.2%; SD DUO- 72.2%, 97.2%; Multiplo- 80.7%, 88.7%; Chembio – 82.5%, 96.4%; DetermineTP- 89.3%, 97.5%. The 3 treponemal/HIV assays sensitivity was 100% for 437 known HIV-positives compared to standard assays.

Conclusion Positive agreement was greater for HIV antibodies than for treponemal antibodies; Using banked sera could have affected performance of treponemal assays. Further prospective studies need to be performed in the field to better characterise performance of RPOCT treponemal tests. Findings from this study will provide data to guide countries' selection of RPOCTs for syphilis and HIV screening.

Disclosure of interest statement The reagents/kits for this study, were donated by the various manufacturers (Standard Diagnostics, MedMira, Chembio, and Alere).

002.6 A LOW-COST MOBILE NAAT PLATFORM FOR CHLAMYDIA TRACHOMATIS

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We report the development of a low-cost mobile nucleic acid analysis platform (mobiLab) utilising a smartphone-enabled microfluidic device for streamlined analysis of biological samples. Using magnetic particles as a mobile solid phase for nucleic acid capture and transport, fluidic processing is simplified to particle translocation on a robust and scalable cartridge.

Process integration facilitated by Bluetooth-enabled microcontrollers enables full control of the instrument by the user with a smartphone application. Each cartridge costs less than \$2 using off-the-shelf reagents and materials, an order of magnitude cheaper than \$9.98/test for a GeneXpert cartridge. The instrument utilises a microcontroller which controls the rotary bead manipulator, thermal incubation and Bluetooth-based communication with the smartphone application. Each assay consumes approximately 10% of the battery capacity, allowing up to 10 assays to be performed consecutively without access to a power outlet.

We designed a single-stream loop-mediated isothermal amplification (LAMP) assay to operate in tandem with the mobiLab platform. We tested the single-stream assay using plasmid targets and were able to capture and amplify 10³ copies of gene targets. Absence of cross-reactivity with human genomic DNA or other vaginal flora was verified.

The platform was validated by testing *Chlamydia trachomatis* infection from patient-collected vaginal swab samples. Volunteers enrolled in an internet-based Chlamydia screening program, where two sets of swabs were self-collected and mailed back to our lab. One set of swabs was analysed using the gold standard Gen-Probe AC2 CT assay. The second set of swabs was tested using the mobiLab platform. The two results were in agreement for 20 out of 20 samples at a time threshold of 30 min, demonstrating that the droplet assay performance is comparable to the gold standard for the samples tested. To our knowledge, this abstract presents the first smartphone-based NAAT platform that integrates sample preparation, amplification and data processing. **Disclosure of interest statement** None to disclose.

003 - Extragenital STIs

003.1 CORRELATES OF REPEAT ANORECTAL INFECTIONS AMONG MEN WHO HAVE SEX WITH MEN

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Introduction There is increasing concern about azithromycin treatment failure for rectal chlamydia. Higher organism loads have been reported at the rectal site compared to other sites (genital/oral) and higher organism load may be associated with treatment failure in women, but little data are available among men who have sex with men (MSM). This study examined the association between organism load and repeat rectal chlamydia infection in order to investigate possible mechanisms for treatment failure.

Methods Stored rectal chlamydia positive samples from men attending Melbourne Sexual Health Centre between July 2008 to October 2013 were analysed for organism load and chlamydia serovar. Men were included if they had a follow-up test within 100 days of the index infection.

Results There were 292 chlamydia positive index rectal swabs available for analysis. Organism load and serovar were assessable for 284 swabs — 44 cases had one repeat positive result, 5 cases had two repeat positives and 181 MSM had a negative result within 100 days of their index positive result. Among the 230 index infections, 33% were serovar G, 30% were D, 15% were J, 9% were E, 7% were L2, 3% were B and 2% were F. The cumulative incidence of repeat rectal chlamydia within 100 days was 21%. Among those men who had a repeat positive result, all but three (3%) were the same serovar. Organism load was higher in index cases of men who had a repeat infection compared with those who did not ($p < 0.01$).

Conclusion Repeat rectal chlamydia is common within 100 days among MSM attending MSHC. Most repeat infections were of the same serovar suggesting these infections were either treatment failure or re-infection from an infected partner. High organism load was associated with repeat infection suggesting a possible role in treatment failure.

Disclosure of interest statement None.

003.2 THE CONTRIBUTION OF *MYCOPLASMA GENITALIUM* TO THE AETIOLOGY OF SEXUALLY ACQUIRED PROCTITIS IN MEN WHO HAVE SEX WITH MEN

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Background To determine the contribution of *Mycoplasma genitalium* to the aetiology of sexually acquired proctitis in HIV positive and HIV negative men who have sex with men (MSM).

Methods Consecutive MSM diagnosed clinically with proctitis between May 2012 and August 2013 were tested for: rectal *M. genitalium* by real time PCR assay; chlamydia by strand displacement assay; gonorrhoea by culture; and herpes simplex virus (HSV) by in-house PCR. *M. genitalium* load was determined by qPCR assay targeting the MgPa gene. The loads of rectal *M. genitalium* in men with symptomatic proctitis were compared to those in a control group of men (ratio 1:1) with rectal *M. genitalium* but no symptoms of proctitis.

Results Among 154 MSM with proctitis, rectal *M. genitalium* was detected in 12% (18/154, 95% CI: 6.9–17.1). Rectal *M. genitalium* was significantly more common among HIV positive men (10/48, 21%; 95% CI: 9.5–32.6) compared with HIV negative men (8/106, 8%; 95% CI: 2.9–13.1, $p = 0.02$). Among HIV positive men the rate of *M. genitalium* was comparable to that for chlamydia (21%), gonorrhoea (25%) and HSV (19%). The median load of *M. genitalium* among 18 men with symptomatic proctitis was significantly higher than the median load among 18 controls who had asymptomatic rectal *M. genitalium* (4.82 log₁₀ load/sample versus 3.81 log₁₀ load/sample, $p = 0.016$).

Conclusion *M. genitalium* was common among MSM with symptomatic proctitis, especially those with HIV. Comprehensive testing for multiple sexually acquired pathogens in MSM presenting with proctitis is required and should include testing for *M. genitalium*.

Disclosure of interest statement None to disclose.

003.3 THE PREVALENCE OF *MYCOPLASMA GENITALIUM* AND *CHLAMYDIA TRACHOMATIS* AT VARIOUS ANATOMICAL SITES OF MEN WHO HAVE SEX WITH MEN IN FIVE CITIES OF CHINA

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Introduction To determine the prevalence of *Mycoplasma genitalium* and *Chlamydia trachomatis* in urethra, rectum and pharynx of men who have sex with men (MSM) in China, and to analyse the association between the agents detection and clinical manifestations.

Methods 388 MSM were recruited at gay bars in five cities of China from September 2007 to November 2008. Rectal and pharyngeal swabs and first void urine were tested for *M. genitalium* and *C. trachomatis* by PCR. Bivariate and multivariable