quick STI risk-assessment may help people to seek testing. An online self-assessment can enhance privacy and confidentiality, empower clients, and is likely to appeal to more technology confident groups such as young people.

P067

TIMING OF PRIMARY SYPHILIS TREATMENT AND IMPACT ON THE DEVELOPMENT OF TREPONEMAL ANTIBODIES: A CROSS-SECTIONAL CLINIC-BASED STUDY

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Background Serology is negative in a proportion of primary syphilis cases where *Treponema pallidum* polymerase chain reaction (PCR) testing is positive. We aimed to identify discordant, T. pallidum PCR-positive, serology negative primary syphilis cases and any clinical or laboratory factors associated with failure to subsequently seroconvert.

Methods Serodiscordant primary syphilis cases that were T. pallidum PCR positive and serology negative (including rapid plasma reagin, T. pallidum particle agglutination, T. pallidum enzyme immunoassay or T. pallidum chemiluminescence assay) were identified from the Melbourne Sexual Health Centre electronic records between April 2011 and December 2019. Clinical and laboratory associations were examined.

Results There were 814 primary syphilis cases in the study period and 38 (4.7%) were serodiscordant, 35 in men who have sex with men. Thirty-two had follow-up serology performed a median of 24 days later, of which 16 (50%) seroconverted, mostly (81%) within six weeks. Failure to seroconvert was significantly associated with treatment on day 1. Of the 12 cases treated on day 1, 10/12 (83%) failed to seroconvert compared to 6/20 (30%) among those who were treated after day 1.

Discussion Earlier treatment of primary syphilis can prevent the development of serological markers. T. pallidum PCR can identify primary syphilis lesions before the development of serological markers and improve diagnosis of early primary syphilis lesions. Serology alone will miss a proportion of primary syphilis infections and should be repeated if a diagnosis of syphilis is being considered.

P069

THE EPIDEMIOLOGY OF HERPES SIMPLEX VIRUS TYPE 2 IN SUB-SAHARAN AFRICA: SYSTEMATIC REVIEW, META-ANALYSES, AND META-REGRESSIONS

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Background Herpes simplex virus type 2 (HSV-2) infection is a prevalent sexually transmitted infection with a sizable disease burden that is highest in sub-Saharan Africa. This study aimed to characterize HSV-2 epidemiology in this region.

Methods Cochrane and PRISMA guidelines were followed to systematically review, synthesize, and report HSV-2 related findings. Meta-analyses and meta-regressions were conducted.

Results From 218 relevant publications, 451 overall outcome measures and 869 stratified measures were extracted. Pooled incidence rates ranged between 2.4–19.4 per 100 person-years across populations. Pooled seroprevalence was lowest at 37.3% (95% confidence interval (CI): 34.9–39.7%) in general populations and high in female sex workers and HIV positive individuals at 62.5% (95% CI: 54.8–70.0%) and 71.3% (95% CI: 66.5–75.9%), respectively. In general populations, pooled seroprevalence increased steadily with age. Compared to women, men had a lower seroprevalence with an adjusted risk ratio (ARR) of 0.61 (95% CI: 0.56–0.67). Seroprevalence decreased in recent decades with an ARR of 0.98 (95% CI: 0.97–0.99) per year. Seroprevalence was highest in Eastern and Southern Africa. Pooled HSV-2 proportion in genital ulcer disease was 50.7% (95% CI: 44.7–56.8%) and in genital herpes it was 97.3% (95% CI: 84.4–100%).

Conclusions Seroprevalence is declining by 2% per year, but a third of the population is infected. Age and geography play profound roles in HSV-2 epidemiology. Temporal declines and geographic distribution of HSV-2 seroprevalence mirror that of HIV prevalence, suggesting sexual risk behavior has been declining for three decades. HSV-2 is the etiological cause of half of GUD and nearly all genital herpes cases.

P070

EPIDEMIOLOGY OF HERPES SIMPLEX VIRUS TYPE 2 IN LATIN AMERICA AND THE CARIBBEAN: SYSTEMATIC REVIEW, META-ANALYSES, AND META-REGRESSIONS

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Background Herpes simplex virus type 2 (HSV-2) infection is a sexually transmitted infection of global concern. This study

aims to characterize epidemiology of herpes simplex virus type 2 (HSV-2) in Latin America and the Caribbean.

Methods HSV-2 reports were systematically reviewed and synthesized, and findings were reported following PRISMA guidelines. Meta-analyses and meta-regressions were conducted.

Results 102 relevant reports were identified including 13 overall incidence measures, 163 overall (and 402 stratified) seroprevalence measures, and 7 and 10 proportions of virus detection in genital ulcer disease (GUD) and in genital herpes, respectively. Pooled mean seroprevalence was 20.6% (95% confidence interval (CI): 18.7–22.5%) in general populations, 33.3% (95% CI: 26.0–41.0%) in intermediate-risk populations, 74.8% (95% CI: 70.6–78.8%) in female sex workers, and 54.6% (95% CI: 47.4–61.7%) in male sex workers, men who have sex with men, and transgender people. In general populations, seroprevalence increased from 9.6% (95% CI: 7.1–12.4%) in those aged <20 years, to 17.9% (95% CI: 13.6–22.5%) in those 20–30, 27.6% (95% CI: 21.4–34.2%) in those 30–40, and 38.4% (95% CI: 32.8–44.2%) in those >40. Compared to women, men had lower seroprevalence with an adjusted relative risk (ARR) of 0.68 (95% CI: 0.60–0.76). Seroprevalence declined by 2% per year over the last three decades [ARR of 0.98 (95% CI: 0.97–0.99)]. Pooled mean proportions of HSV-2 detection in GUD and genital herpes were 41.4% (95% CI: 18.9–67.0%) and 91.1% (95% CI: 82.7–97.2%), respectively.

Conclusion One in five adults is HSV-2 infected, a higher level than other world regions, but seroprevalence is declining. Despite this decline, HSV-2 persists as the etiological cause of nearly half of GUD cases and almost all of genital herpes cases.

P074 IN VITRO AND IN VIVO EFFICACY OF LINEZOLID ON *TREPONEMA PALLIDUM*, THE SYPHILIS AGENT

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Background Penicillin G (PG), the current standard for syphilis treatment, has important drawbacks that hamper public health efforts to curtail the spread of this infection, particularly in low- and middle-income countries where syphilis is still endemic.

Methods To identify viable alternatives to PG, we tested—both in vitro and in vivo—three marketed antibiotics with adequate pharmacokinetic and pharmacodynamic properties to treat syphilis.

Results We found that linezolid, an oxazolidinone overcoming most of the current drawbacks of PG, showed in vitro bactericidal activity at concentrations of 0.5 µg/mL or higher. When

administered orally to experimentally infected rabbits, it induced healing of early lesions at a similar time of PG and effectively treated the infection. The hazard ratio for healing was 3.84 (95% CI 2.05 – 7.17; $p < 0.0001$) compared to untreated controls.

Conclusions Our findings warrant further research to assess the efficacy of linezolid as an alternative to PG to treat early syphilis in clinical settings.

P077 EVALUATION OF THREE AUTOMATED NONTREPONEMAL RAPID PLASMA REAGIN (RPR) TESTS FOR THE DIAGNOSIS OF SYPHILIS

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Background Automated nontreponemal rapid plasma reagin (RPR) tests were recently introduced in the United States and limited performance data is available.

Methods In collaboration with the Association of Public Health Laboratories, three public health laboratories (PHL) were selected through competitive bidding to evaluate the performance of three FDA-cleared automated RPR tests: AIX-1000 (Gold Standard Diagnostics); ASI Evolution (Arlington Scientific); and BioPlex 2200 Syphilis Total & RPR assay (Bio-Rad Laboratories) for syphilis testing. CDC prepared three panels that included: a qualitative panel comprised of 455 syphilis reactive/nonreactive specimens; a quantitative panel comprised of 50 syphilis reactive (titer 1:64 to 1:1024) specimens; and a reproducibility panel comprised of 15 nonreactive and reactive (titer 1:1 to 1:64) specimens. Specimens were tested following manufacturers' instructions. For the reproducibility panel, each specimen was tested 10 times. Prior test results were blinded throughout testing to all sites. Results from the automated RPR tests were compared to CDC data obtained by manual RPR (Arlington Scientific) and *T. pallidum* particle agglutination assays (TPPA, Fujirebio) for analysis.

Results Testing of the qualitative panel demonstrated sensitivity and specificity of 97.5% and 99.5% for AIX1000, 91.1% and 98.5% for ASI Evolution, and 90.1% and 99.0% for Bioplex, respectively, when compared to the manual RPR and confirmed by TPPA. Testing of the quantitative panel showed within range results (± 2 -fold to manual RPR titer) for 94%, 48%, 68% of specimens by AIX-1000, ASI Evolution and BioPlex, respectively. For the three automated RPR tests, reproducibility testing demonstrated 30–100% agreement, with Bioplex showing slightly elevated titer when compared to manual RPR.

Conclusion The introduction of automated RPR assays for syphilis could help expediting syphilis testing, reducing workload and interpretation related errors. However, further testing is needed to establish reproducibility and full titer range validation relative to manual RPR.