P3.128 DEVELOPMENT OF A RISK CALCULATOR FOR THE 3-MONTH PREDICTION OF INCIDENT SYPHILIS INFECTION AMONG HIGH-RISK MEN WHO HAVE SEX WITH MEN AND TRANSGENDER WOMEN PRESENTING TO A STD CLINIC IN LIMA, PERU

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Introduction Syphilis incidence worldwide has rebounded since 2000, especially among men who have sex with men (MSM). A predictive model for incident syphilis infection may inform prevention counselling and use of chemoprophylaxis.
Methods We analysed data from a longitudinal study of a STD clinic-based cohort of MSM and transgender women reporting a history of HIV or syphilis infection and/or high-risk sexual behaviour, followed quarterly for two years. Incident infection was defined as a four-fold increase in RPR titers or new RPR reactivity if two prior titers were non-reactive. We used generalised estimating equations with a Poisson regression to develop a predictive model of syphilis incidence in one-half of the data set, and verified the model in the second half, calculating an area under the curve (AUC), summarising specificity and sensitivity. We then applied the final model to the full baseline dataset. Finally we developed an online risk calculator from our model.
Results Among 401 participants enrolled, 22% were transgender women and 31% were HIV-infected at baseline. Syphilis incidence was 19.9 cases per 100-person years (95% CI 16.3–24.3). Predictors of syphilis incidence were HIV infection, high number of male sex partners (categorised as: 0, 1, 2–3, 4–9,>10), history of syphilis infection, receptive and versatile anal sex role and condomless receptive anal sex. The AUC was 71% (95% CI 64%–78%) in the validation dataset for incident syphilis infection in the next 3 months. Those at highest risk had a 1-in-7 likelihood of syphilis infection in the next 3 months. When applied to the baseline dataset the AUC was 71% (95% CI 65%–77%) for predicting recent syphilis infection. The online syphilis risk calculator is available at: www.syphrisk.net (English), www.sifriesgo.net (Spanish).
Conclusion Our results show that the likelihood of syphilis infection among a high-risk STD clinic-based cohort can be estimated accurately. Our calculator may guide STD clinical management by directing risk behaviour counselling and potential use of doxycycline chemoprophylaxis.

P3.129 HOW CAN WE USE PHYLOGENETICS TO FACILITATE CLINICAL CASE FINDING AND PARTNER NOTIFICATION IN HIV: LESSONS FROM A SYSTEMATIC REVIEW OF ITS USE IN STIGMATISED INFECTIOUS DISEASES

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Introduction Phylogenetic information provides new horizons for clinical case finding in HIV, but raises issues of acceptability, privacy and even criminalisation. We reviewed studies describing use of phylogenetics to directly inform case finding in community acquired stigmatised infectious diseases.
Methods A search in MEDLINE, Embase, CINAHL and PsychINFO for articles where phylogenetics have been used to facilitate case finding in sexually transmitted infections, TB, HBV or HCV, published until July 2016 in English.
Results 26 of 6042 papers screened met the inclusion criteria; 17 TB, 9 HIV. 19 studies reported using phylogenetics to identify and investigate HIV outbreaks but did not report its role in case finding. Case finding strategies included confirming the source of an outbreak to prompt wider investigation (HIV); investigation of phylogenetically clustered cases (TB, HIV); combined cluster and geographical information to target screening (TB); screening informed by discrepancies between genotypic and epidemiological data (TB); phylogenetic characterisation to inform a screening intervention (HIV); epidemiological data to identify of a source (HIV); and contact tracing with genotype matching to a phenotype (HIV). Facilitators included sharing molecular surveillance data to establish community support in targeted TB screening. Barriers included delayed results, time lapse between cases and refusal of access to premises for screening. However patient barriers were rarely reported. Ethical issues included media coverage of an HIV sources identity.
Conclusion Phylogenetics-informed approaches to case finding are feasible in stigmatised infections. However studies reporting their use in clinical and public health practice provide limited information on patient related barriers, acceptability, or on ethical challenges such as identification of "core" transmitters or criminalisation. Research into patient views on acceptability, risks and preferred approaches to using phylogenetic information for case finding in HIV is needed to inform interventions.

P3.130 POTENTIAL IMPACT OF TESTING FOR *MYCOPLASMA GENITALIUM* INFECTION AND MACROLIDE RESISTANCE: A MATHEMATICAL MODELLING ANALYSIS

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Introduction Patients with genitourinary symptoms are generally treated syndromically with azithromycin, which can induce macrolide resistance in *Mycoplasma genitalium* (MG). Directing treatment based on aetiology and known macrolide susceptibility may prevent emergence of resistance. We constructed a mathematical model to evaluate the potential impact of simultaneous detection of MG and resistance markers on the percent of MG infections that are macrolide-susceptible.
Methods We developed a gender- and risk-stratified, compartmental model of MG transmission within a heterosexual population. We assumed clearance of untreated infections in 30 days; development of symptoms in 2.4% of infected men and 5.1% of infected women; initial treatment of symptomatic men and women with azithromycin; treatment of men with persistent/recurrent symptoms with moxifloxacin; 50% of infections macrolide-susceptible at baseline; *de-novo* macrolide resistance in 18% of susceptible bacteria after azithromycin therapy; and 100% efficacy of moxifloxacin. The model was

calibrated to 1.1% population-level MG prevalence. We modelled the potential impact of using the ResistancePlus MG test (SpeeDx; Sydney, Australia) for symptomatic patients. We conducted sensitivity analyses varying the clearance rate (23–44 days) and percent of infections that are symptomatic in women (0%–11.7%).

Results The model estimated a per-partner MG transmission probability of 0.042. The model predicted that implementing the ResistancePlus test for symptomatic patients would increase the percent of MG infections that are macrolide-susceptible from 50% to 85% in 2 years. In sensitivity analyses, transmission probability estimates and 2 year percent of MG infections that are macrolide-susceptible varied from 0.032–0.047 and 82%–92%, respectively.

Conclusion Directing treatment based on aetiology and known macrolide resistance may preserve the ability to treat MG with azithromycin. Moxifloxacin therapy could be limited to patients with known macrolide-resistant MG infection and prevent treatment failure for those patients.

P3.131 AN EMPIRIC RISK SCORE TO GUIDE PRESUMPTIVE TREATMENT OF ASYMPTOMATIC ANORECTAL INFECTIONS IN MEN WHO HAVE SEX WITH MEN IN KISUMU, KENYA

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Introduction The World Health Organisation (WHO) recommends presumptive therapy (PT) for *Neisseria gonorrhoeae* (GC) and *Chlamydia trachomatis* (CT) in asymptomatic MSM who report unprotected receptive anal intercourse in the past 6 months and either multiple sex partners or a partner with an STI. We aimed to identify predictors of asymptomatic anorectal infection in Kenyan MSM and compare performance of an empiric, model-based risk score to that of the WHO PT algorithm.

Methods Anorectal GC/CT infections were diagnosed at baseline among 698 MSM enrolled in the *Anza Mapema* study in Kisumu, Kenya. Multivariable logistic regression was used to identify associations with asymptomatic GC/CT anorectal infection. We derived a total risk score (range: 0–5) for each participant using the coefficients of the final multivariable model. Risk score algorithm performance was compared to WHO algorithm performance with respect to sensitivity, specificity, and number needed to treat (NNT).

Results Asymptomatic GC/CT anorectal infection prevalence was 4.2%. Predictors and corresponding risk scores were: HIV infection (2), age 18–24 years (2), and unprotected anal sex (1). A risk score $\geq$3 was 83% sensitive and 65% specific in detecting asymptomatic GC/CT anorectal infection. In contrast, the WHO PT algorithm had low sensitivity (25%), but was 84% specific. While 37% of asymptomatic participants met PT eligibility criteria using a risk score $\geq$3, only 17% met eligibility by WHO PT criteria. Using our risk score algorithm, 12 participants would need PT to treat one GC/CT anorectal infection, compared to 38 participants by WHO criteria.

Conclusion An empiric risk score based on age, HIV status, and unprotected anal sex improved both sensitivity and efficiency (i.e., NNT) of identification of asymptomatic GC/CT anorectal infection, compared to the WHO PT algorithm. If validated in other settings, this risk score could improve the management of asymptomatic GC/CT anorectal infections in settings where diagnostic testing is not available.

P3.132 PROJECTING THE EPIDEMIOLOGICAL EFFECT, COST-EFFECTIVENESS AND TRANSMISSION OF HIV DRUG RESISTANCE IN VIETNAM ASSOCIATED WITH VIRAL LOAD MONITORING STRATEGIES

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Introduction Objectives: The objective of this study was to investigate the potential epidemiological impact of viral load (VL) monitoring and its cost-effectiveness in Vietnam, where transmitted HIV drug resistance (TDR) prevalence has increased from 5% to 5%–15% in the past decade.

Methods Using a population-based mathematical model driven by data from Vietnam, we simulated scenarios of various combinations of VL testing coverage, VL thresholds for second-line ART initiation and availability of HIV drug-resistance tests. We assessed the cost per disability-adjusted life year (DALY) averted for each scenario.

Results Projecting expected ART scale-up levels, to approximately double the number of people on ART by 2030, will lead to an estimated 18 510 cases (95% CI: 9120–34 600 cases) of TDR and 55 180 cases (95% CI: 40540–65 900 cases) of acquired drug resistance (ADR) in the absence of VL monitoring. This projection corresponds to a TDR prevalence of 16% (95% CI: 11%–24%) and ADR of 18% (95% CI: 15%–20%). Annual or biennial VL monitoring with 30% coverage is expected to relieve 12%–31% of TDR (2260–5860 cases), 25%–59% of ADR (9620–22 650 cases), 2%–6% of HIV-related deaths (360–880 cases) and 19270–51400 DALYs during 2015–30. The 30% coverage of VL monitoring is estimated to cost US$4848–5154 per DALY averted. The projected additional cost for implementing this strategy is US $105–268 million over 2015–30.

Conclusion Our study suggests that a programmatically achievable 30% coverage of VL monitoring can have considerable benefits for individuals and leads to population health benefits by reducing the overall national burden of HIV drug resistance. It is marginally cost-effective according to common willingness-to-pay thresholds.

P3.133 EVALUATION OF PRODUCTION AND LYTIC CAPACITY OF VAGINOLYSIN PRODUCED BY BIOTYPES OF *GARDNERELLA VAGINALIS*

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Introduction: *Gardnerella* vaginalis is the main etiological agent of bacterial vaginosis (BV), this bacteria has been classified in eight biotypes based on the production of beta-galactosidase, hydrolysis of hippurate and lipase, additionally produces several virulence factors, among them vaginolysin (VLY) is the most important. VLY is a pore-forming cytolysin that damages cells structurally and functionally through the