Disclosure of interest statement All research has been funded by the National Research Foundation and Nanotechnology Innovation Centre. No commercial funding has been provided for this study.

P16 - HIV epidemiology

P16.01 AN AGENT-BASED MODEL TO SIMULATE AND PREDICT HIV EPIDEMIC IN BALTIMORE CITY, MARYLAND, USA

[1]J Adleberg, [1]R Rothman, [2]C Flynn, [3]C Nganga-Good, [1]Y-H Hsieh*. *[1]Department of Emergency Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA; [2]Maryland Department of Health and Mental Hygiene, Baltimore, Maryland, USA; [3]Baltimore City Health Department, Baltimore, Maryland, USA*

10.1136/sextrans-2015-052270.548

Introduction Baltimore City has one of the highest HIV incidences and prevalences in the United States. An HIV testing program, implemented in several emergency departments (EDs), has accounted for 11% of newly diagnosed HIV cases from 2008–2013. We derive an agent-based model (ABM) for HIV transmission in Baltimore City, and use this to determine the significance of ED-based HIV testing on HIV transmission.
Methods An agent-based computational simulation was performed via the Python programming language, using 523,113 agents to represent the 13+ population of Baltimore City. The simulation was calibrated using HIV prevalence and incidence data culled from 2007 to 2013 City surveillance data. During each timestep, agents interacted with other agents. Agents were assigned one of three categories: seronegative, seropositive aware, or seropositive unaware, and individual risks were assigned from these categories, with seropositive unaware agents being 3.5 times more likely to transmit the disease. ED testing changed unaware agents to aware, and rates of testing were varied in order to study the effects on overall incidence. A subsequent sensitivity analysis was performed using different ranges of parameters, and a range of incidence projections was calculated.
Results Baltimore City HIV incidence decreased from 1,052 new cases (0.207%) in 2007 to 356 (0.068%) in 2013. Our model was able to approximate HIV incidence over time as observed from 2007 to 2013. Overall HIV incidence is forecast to decrease from 0.068% in 2013 to 0.042% in 2020 (95% CI: 0.015–0.079). It is further demonstrated that doubling capacity of the ED-based testing programs would likely avert 35 additional HIV transmissions from 2014 to 2020.
Conclusion We conclude that ABM provides an effective means of describing an epidemic with a highly heterogeneous population, and additionally that the ED-based testing program has had a significant impact on curtailing HIV transmission in Baltimore City.
Disclosure of interest statement This work was supported by a National Institutes of Health grant [K01AI100681 to Y-HH]. No conflicts of interest are reported.

P16.02 PREDICTORS OF HIV ACQUISITION WITHIN 12 MONTHS OF AN HIV NEGATIVE TEST IN MEN WHO HAVE SEX WITH MEN

[1,2]KT Cheung*, [1,3]CK Fairley, [1,3]TRH Read, [1]I Denham, [1]G Fehler, [1,3]CS Bradshaw, [1,3]MY Chen, [1,3]EPF Chow. *[1]Melbourne Sexual Health Centre, Alfred Health, Melbourne, VIC Australia; [2]Melbourne Medical School, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne, Melbourne, VIC, Australia; [3]Central Clinical School, Faculty of Medicine, Nursing and Health Sciences, Monash University, Melbourne, VIC, Australia*

10.1136/sextrans-2015-052270.549

Introduction Studies of risk factors for HIV infection usually ascertain these at the time of diagnosis, when they are subject to multiple biases. This study aimed to identify factors present at the time of the last negative HIV test that could predict the risk of HIV acquisition within the next 12 months among men who have sex with men (MSM) attending a sexual health service in Australia. This may allow prioritisation of MSM for preventive interventions, which are becoming increasingly expensive.
Methods We conducted a retrospective cohort study of MSM attending Melbourne Sexual Health Centre between 1 January 2007 and 31 December 2013 with at least two HIV tests within 12 months. Age, sexual behaviour, and bacterial STI diagnoses were extracted from the date of the last negative HIV test and HIV incidence rate ratios (RR) were calculated for each risk factor. Risk factor prevalence was compared among all MSM and those subsequently infected.
Results Of 14745 MSM, 5262 were eligible, contributing 6525 person-years follow-up. 85 new HIV diagnoses were identified within 12 months of a HIV negative test with an incidence of 1.3 (95% CI: 1.0–1.6) per 100 person-years. Significant associations with subsequent HIV infection were: gonorrhoea at any site (RR: 4.1, 95% CI: 2.3–7.0), chlamydia RR: 3.9 (2.3–6.3), inconsistent condom use RR 2.7 (1.6–4.5), and injecting drugs RR 4.1 (1.7–8.6). Risk factor prevalences in tested MSM compared to those subsequently infected were: any bacterial STI (26% vs. 42%), inconsistent condom use (49% vs. 73%), any significant risk factors (60% vs. 83%).
Conclusion This analysis of a large clinic cohort identified significant predictors of subsequent HIV infection that were present at the last negative HIV test, when preventive intervention would still be possible. These could be used to prioritise MSM for potentially costly interventions.
Disclosure of interest statement We declare no conflict of interest.

P16.03 COMPARISON OF SEXUAL RISK BEHAVIOURS AMONG HIV POSITIVE MEN WHO HAVE SEX WITH MEN BEFORE AND AFTER THEIR DIAGNOSIS

[1]Gino M Calvo, [2,3]Kelika A Konda, [2]Segundo R León, [2]Silver Vargas, [1]Hugo Sánchez, [4]Hector J Salvatierra, [5]Brandon Brown, [3]Jeffrey D Klausner, [2]Carlos F Caceres. *[1]Epicentro, Lima, Peru; [2]Unit of Health, Sexuality and Human Development, and Laboratory of Sexual Health, Universidad Peruana Cayetano Heredia, Lima, Peru; [3]University of California, Los Angeles, CA, USA; [4]Alberto Barton Health Center, Health Directorate of Callao, Lima, Peru; [5]Program in Public Health, University of California, Irvine, CA, USA*

10.1136/sextrans-2015-052270.550