

Incidence and risk factors for early syphilis among men who have sex with men attending a sexual health clinic in Australia: a retrospective cohort study

Aung ET^{1,2}, Fairley CK^{1,2}, Denham I¹, Ong JJ^{1,2}, Chen MY^{1,2}, Phillips TR^{1,2}, Tran J^{1,2}, Chow EPF^{1,2,3}

¹Melbourne Sexual Health Centre, Alfred Health, Melbourne, Victoria, Australia, ²Central Clinical School, Faculty of Medicine, Nursing and Health Science, Monash University, Melbourne, Victoria, Australia, ³Centre for Epidemiology and Biostatistics, Melbourne School of Population and Global Health, The University of Melbourne, Melbourne, Victoria, Australia

Background: Our study aims to identify risk factors associated with syphilis infection and examine the incidence of syphilis in MSM.

Methods: We conducted a retrospective cohort study of MSM attending a sexual health clinic in Victoria, Australia during 2013-2019 with at least two syphilis serology during the study period. Demographic characteristics, sexual practices, and bacterial sexually transmitted infections (STI) and HIV infection diagnoses were extracted. Syphilis incidence rate expressed as per 100 person-years for each characteristic was calculated. Multivariable Cox's regression model with risk factors whose incidence were higher than that of study population was performed to identify the risk factors for syphilis infection.

Results: A total of 24,391 MSM (75,086 consultations) were included in the study, contributing 38,396 person-years of follow-up. 1,404 new syphilis diagnosis were identified with an incidence of 3.7 per 100 person-years (95% CI: 3.5-3.9). The incidence rate in MSM living with HIV was 9.3 (95% CI: 8.5-10.1) and MSM taking PrEP was 6.9 (95% CI: 6.1-7.8). Risk factors associated with infectious syphilis included: MSM living with HIV, MSM taking PrEP, past history of syphilis infection, injecting drug use, condomless anal sex, four or more sexual partners in the last 12 months, and concurrent STI (chlamydia and gonorrhoea). A cumulative effect of risk factors was observed with having any two risk factors increased the risk of infection by three times [HR 3.0, 95% CI: 2.5 – 3.6, $p < 0.001$], while having five risk factors increased by twenty times [HR 19.8, 95% CI: 11.7-33.3, $P < 0.001$].

Conclusion: High incidence rate was observed in MSM confirming the ongoing need to address syphilis control in this key population. Targeted interventions including biomedical and behavioural intervention to subgroups of MSM who are at the highest risk of syphilis infection should be considered.

Disclosure of Interest Statement: Financial interests: All authors have no financial conflicts of interest to declare.

Non-financial interest: EPFC is supported by an Australian NHMRC Emerging Leadership Investigator Grant (GNT1172873). CKF is supported by an Australian NHMRC Leadership Investigator Grant (GNT1172900). JJO is supported by an Australian NHMRC Emerging Leadership Investigator Grant (GNT1193955). ETA is supported by Australian Government Research Training Program (RTP) scholarship from Monash University and Research Entry Scholarship from the Chapter of Sexual Health Medicine, Royal Australasian College of Physician. JT is supported by Australian Government Research Training Program (RTP) Scholarship from Monash University. All other authors have no conflicts of interest to declare.