

Gini coefficients for measuring the distribution of sexually transmitted infections among different risk groups in Australia

Authors:

Latt P M¹⁻², Soe N N¹⁻², Xu X¹⁻³, Fairley C K¹⁻³, Zhang L¹⁻⁴

¹ Melbourne Sexual Health Centre, Alfred Health, Melbourne, Australia, ² Central Clinical School, Faculty of Medicine, Nursing and Health Sciences, Monash University, Melbourne, Australia, ³ China Australia Joint Research Center for Infectious Diseases, School of Public Health, Xi'an Jiaotong University Health Science Centre, Xi'an, Shaanxi, People's Republic of China, ⁴ Department of Epidemiology and Biostatistics, College of Public Health, Zhengzhou University, Zhengzhou, Henan, People's Republic of China.

Background:

Gini coefficients have been used to measure economic inequality. The aim was to use the Gini coefficient to investigate how sexually transmitted infections (STIs) are concentrated in various risk groups and provide insights for targeted prevention to those with the greatest risk.

Methods:

The patients' demographic information and sexual practices are recorded with a computer-assisted self-interview for Melbourne Sexual Health Centre (MSHC) visit. We conducted a retrospective study by using these existing records from March 2015 to December 2018. We first used the readily developed artificial intelligence (AI)-based risk prediction tool to calculate the risk scores for each visit. We then used the predicted risk scores to calculate the Gini coefficients and 95% confidence intervals (CIs) for gonorrhoea, chlamydia, syphilis, and HIV infections using MATLAB.

Results:

Among all visits, the positivity rate of chlamydia (8.8%) is the highest, followed by gonorrhoea (7.7%), syphilis (1.94%) and HIV (0.24%). The inequality of infection risk, measured by Gini coefficients, was the highest in syphilis (0.6 (0.57-0.64)), followed by HIV (0.6 (0.52-0.62)), gonorrhoea (0.4 (0.36-0.42)) and chlamydia (0.31 (0.28-0.35)).

Compared with heterosexual males and females, MSM had the highest rates of chlamydia, gonorrhoea, syphilis, and HIV positivity, at 10.9%, 13.0%, 6.2%, and 0.4%, respectively. In contrast, MSM had less inequality of risk indicated by the Gini coefficients of 0.23 (0.21-0.25), 0.24 (0.23-0.27), 0.50 (0.46-0.53) and 0.54 (0.49-0.59). The corresponding Gini coefficient were 0.4, 0.6, 0.9 and 0.9 in heterosexual males and 0.4, 0.6, 0.9 and almost 1 in heterosexual females.

Conclusion:

Overall, the inequality of infection risk was higher among syphilis and HIV than that of chlamydia and gonorrhoea. MSM had the highest rate of STI positivity, but infection risk distribution was more homogenous than heterosexual males and females.

Disclosure of interest Statement:

No conflict of interest declared.