

MODELLING STUDY OF THE ASSOCIATION BETWEEN SEXUALLY TRANSMITTED INFECTIONS

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To understand the dynamics of sexually transmitted infections (STIs), understanding sexual behavior is important. However, quantification of sexual behavior is difficult due to its nature. Indeed, our analysis showed no clear trend between HIV prevalence and the estimated sexual behavior [1]. Instead of sexual behavior, the use of STIs prevalences as a bio-marker of other STIs was proposed. To assess the accuracy, we analyzed the association between sexually transmitted infections. An individual-based mathematical model was constructed to describe temporal sexual contact network [2] and STI transmissions of HIV, herpes simplex virus type 2 (HSV-2), gonorrhea, chlamydia, and syphilis. Model was parametrized with representative biological and behavioral data. A total of 500 varied sexual networks were simulated, on each of which STI transmission was also simulated. Associations were assessed on model-simulated STI prevalences. Regressions were conducted to evaluate the predictability of HIV prevalence from each of the other STI prevalences. Sexual networks affect different STIs in both similar and variable ways, leading to rich dynamics and varying associations between STIs. Still, knowledge of the prevalence of one STI can be predictive of that of another STI. This outcome is specially relevant for HIV, as prevalence of other STIs can be used as an objective biomarker for HIV epidemic potential.

References

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