

CHANGES IN SPATIAL NETWORK OVER TIME IMPACT HIV AND HCV TRANSMISSION AND TARGETED INTERVENTION EFFICIENCY IN A LONGITUDINAL COHORT OF PEOPLE WHO INJECT DRUGS: A MODELING STUDY

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Background:

Spatially targeting interventions like harm reduction and HIV/hepatitis C (HCV) testing and treatment services at injection venues may efficiently provide care to people who inject drugs (PWID). However, understanding its effectiveness given the dynamic nature of PWID spatial and social networks is complex. We explored the efficiency of spatially targeted interventions through an HIV/HCV transmission model that leveraged longitudinal socio-spatial network data from a PWID cohort in New Delhi, India.

Methods:

The socio-spatial network cohort recruited 2512 PWID in 2017-2019, followed by a preliminary post-COVID-19 recruitment (2022-2023) of 987 participants, using a sociometric design (named injection partner). Based on network and behavior data, we constructed an individual-network model to simulate HIV/HCV transmission. We simulated the impacts of using injection venues as service delivery points for medication for opioid use disorder, syringe service programs, HIV/HCV testing and treatment in the context of changing injection venues and partnerships between the two recruitments.

Results:

The 2022-23 preliminary cohort injected at a larger number (median = 6 vs. 3) and a more diverse range of venues (top popular 2 venues frequented by 33.4% vs. 52.5% of individuals) and was more likely to form injecting tie with participants from the same venue (95% vs. 77%). These time-sensitive changes impacted the effectiveness of targeting services at frequently visited venues by year 3 which led to a 7.2% relative decrease in HIV prevalence (9.9% - HCV) compared to a 16.3% decrease (17.6% - HCV) using 2017-19 network. Overall, basing intervention strategies solely on 2017-19 network could underestimate resulting HIV/HCV prevalence when targeting < 4 injection venues or overestimate disease prevalence if targeting service coverage in > top 4 venues.

Conclusion:

In high-burden settings, the effectiveness of targeting specific injecting venues for interventions will be greatly impacted by changes in socio-spatial network composition.

Disclosure of Interest Statement:

The authors have no conflict of interest to declare.