MODELLING THE EFFECT OF TARGETED INTERVENTIONS ON HEPATITIS C TRANSMISSION THROUGH A NETWORK OF PEOPLE WHO INJECT DRUGS IN KENYA

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Background:
Hepatitis C virus (HCV) prevalence in Kenya's estimated 27,000 people who inject drugs (PWID) is 11-36%. With limited resources, it is imperative that interventions block onward chains of transmission. We analyse the potential impact of targeting interventions based on network characteristics.

Methods:
We analysed network and bio-behavioural data from a sample of 3153 PWID in Kenya. We developed an agent-based model of HCV and HIV transmission among PWID, calibrated to data on prevalence and treatment coverage, and individual-level data on years of injecting, number of injecting partners, and number of injecting sites visited (referred to locally as 'dens'). Model projections compared the impact (in terms of HCV infections averted) of three different approaches to allocating additional harm reduction services : random selection, targeting PWID with the largest number of injecting partners, and targeting PWID with the largest number of dens visited.

Results:
We observe high variability in the number of injecting partners, with the 10% most connected PWID involved in 50% of injecting partnerships. While 76% of participants had recently injected at a 'den', only 3% had visited more than one. HCV positivity was 19% across all participants, 28% among the top 10% most connected, and 31% among those who use more than one den.

In the model, the relationship between injecting behaviour and HCV infection is consistent with these findings. Furthermore, targeting PWID that visit multiple dens averts more infections per year compared to random selection (median 30% more cases averted; IQR: -3% - 67%). Targeting PWID with the greatest number of injecting partners was the most effective strategy (median 73% more cases averted compared to random selection; IQR: 44% - 106%).

Conclusion:
Targeting harm reduction resources towards PWID who have many injecting partners and visit multiple injecting sites is an efficient way to reduce HCV incidence in Kenya.

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