MODELLING THE IMPACT OF PREVENTION AND TREATMENT INTERVENTIONS ON HIV AND HEPATITIS C VIRUS TRANSMISSION AMONG PEOPLE WHO INJECT DRUGS IN NAIROBI

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Background:
In Kenya, studies have found low hepatitis C virus (HCV) prevalence (11-16%) compared to HIV prevalence (14-19%) among people who inject drugs (PWID). Needle and syringe programmes (NSP) have scaled-up rapidly since 2012 and pilot HCV treatment programs for PWID are ongoing; however, opiate substitution therapy (OST) coverage is low. We model the impact of existing and scaled-up interventions on HIV/HCV transmission among PWID in Nairobi.

Approach:
We developed a dynamic model of HIV/HCV transmission among PWID, calibrated to data from Nairobi on HIV (14% in 2012) and HCV prevalence (11% in 2015). Due to uncertainty in the ongoing HCV epidemic dynamics, we simulated the HCV epidemic over 2015-2030 as either stable, slowly increasing or rapidly increasing. We evaluated the impact over 2018-2030 of existing levels of interventions and scaling-up OST from 5 to 50% and NSP from 55 to 75% ('full HR'), and/or treating 1000 PWID over 2018-2023.

Outcome:
The model projects that anti-retroviral treatment, NSP and OST currently avert 18% (95% percentile range 12-26%), 31% (16-48%) and 1% (0-1%) of HIV infections annually among PWID, respectively, while NSP and OST avert 36% (19-58%) and 1% (0-1%) of HCV infections annually. Full HR could reduce HIV incidence by 42% (21-60%) and HCV incidence by 92% (45-99%), 68% (12-93%) or 29% (-52-70%) from 2018-2030 depending upon whether the epidemic is stable, slowly increasing or rapidly increasing, respectively. If HCV treatment is also scaled-up, the probability of reducing HCV incidence by 90% over 2018-2030 is >87% if the epidemic is stable/slowly increasing but only 8% if rapidly increasing.

Conclusion:
Existing NSP has had significant impact on HIV and HCV transmission. Scaled-up harm reduction and HCV treatment may achieve HCV elimination; however, the impact of interventions depend heavily on the future dynamics of the HCV epidemic which are highly uncertain.