Hepatitis C virus treatment as prevention in people who inject drugs

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Alexei Zelenev and colleagues presented an elegant analysis of treatment-as-prevention (TasP) for hepatitis C virus (HCV) in people who inject drugs (PWID),[1] using a model capturing the dynamics of the injecting-partnership network, which is superior to the more-common approaches of compartmental modelling (omitting network structure) and static network modelling (omitting changes in partnerships over time).

Their findings regarding the importance of diversity in PWID populations and injecting-partnership networks reinforce a recent study[2] which used behavioural data from PWID in London, England, to parameterise and compare different dynamic network models, and a standard compartmental model, regarding the impact of TasP. In this population, where HCV prevalence is 43%, TasP can be highly effective but limited information on the detailed characteristics of the injecting-partnership network causes uncertainty in the coverage required.

Zelenev et al.[1] emphasise the need for "sufficient coverage" in settings where TasP could be effective. We highlight that an intense intervention with relatively high coverage will be cheaper and more effective than a less-intensive intervention that is nevertheless "sufficient".[2] This is because transmission is reduced more rapidly and therefore fewer courses of treatment are ultimately required to obtain the same reduction in prevalence (reducing costs) and fewer cases of illness occur (benefiting health).[2] We encourage funders to be bold and commit substantial resources initially, rather than providing 'incremental' funding and requiring evidence of impact before committing further funds. A similar approach to sexually-transmitted infections in England in the mid-2000s, informed by modelling,[3] which achieved success.[4]

Notably, direct comparison of dynamic injecting-partnership network modelling with compartmental modelling (which assumes that everyone is constantly connected equally to everyone else) found the latter is highly over-optimistic regarding TasP, greatly underestimating the coverage necessary for HCV control.[2]

Post-treatment reinfection risk is a key determinant of TasP's cost-effectiveness; it depends upon whether individual patients continue injecting drugs (and whether their injecting practices become safer if so), and HCV prevalence in their injecting partners,[2] which in turn depends upon the scale and targeting[1,2] of TasP and other interventions. Since "small-scale trials are suitable only for measuring the individual-level [behavioural] component [of reinfection risk]",[2] empirical study of the impact of TasP for HCV in PWID, and potential synergies[5] of combining with opiate substitution therapy and needle and syringe programmes, needs to be done at full scale.[6]

Finally, modelling would ideally use realistic dynamic networks, with local population parameters, including progression rates,[7] to inform appropriate intervention decisions.

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