

The Utility of Antiviral Treatment for Primary Prevention of Hepatitis C: A modelling analysis

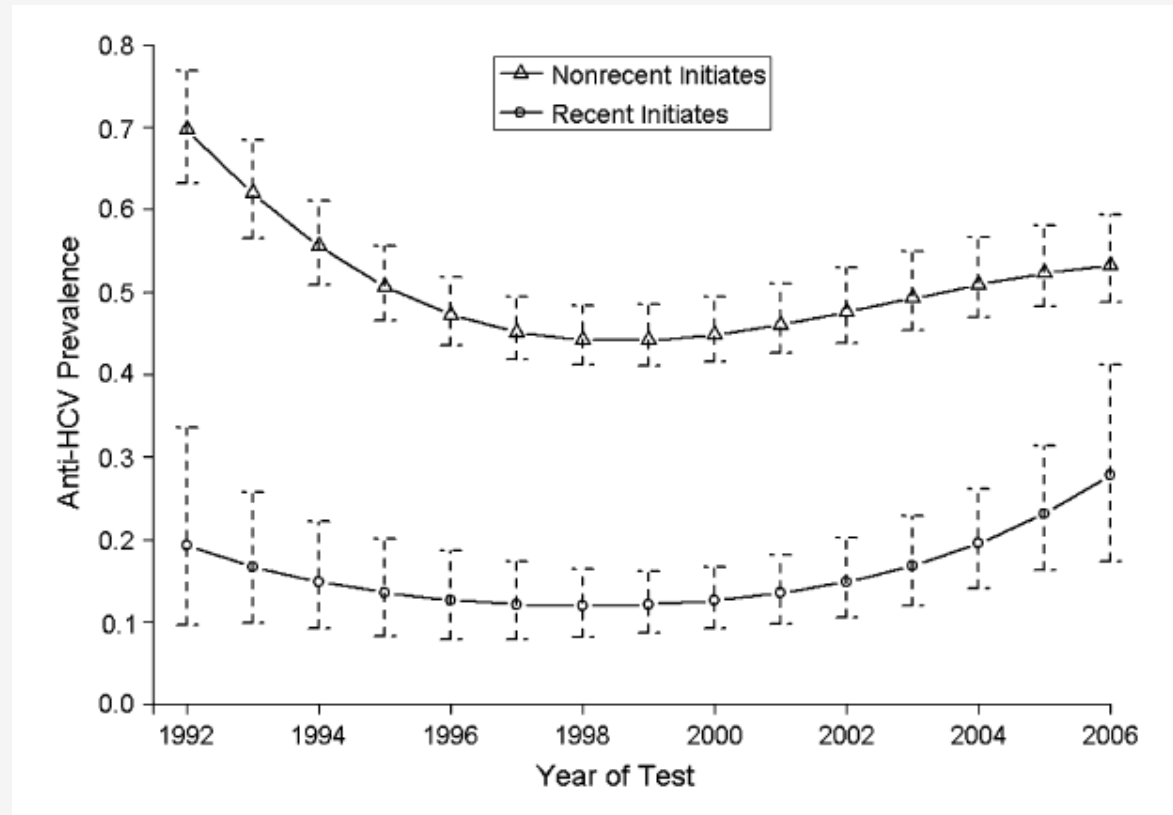
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HCV prevalence among IDUs in England & Wales



Sweeting, M., et al., Hepatitis C infection among injecting drug users in England and Wales 1992-2006: there and back again? *American Journal Epidemiology*, 2009. 170: p. 352-60

HCV antiviral treatment: Barriers among active IDUs

- Antiviral treatment effective (~60%) and approved for active IDUs...
- ...but <1% currently treated

Why?

- Ongoing concern over potential non-completion/compliance and re-infection



What does the evidence say?

- IDU achieve similar SVR and compliance rates as non- or ex-IDU [1]
- Small scale studies report low re-infection rates in first year [2].

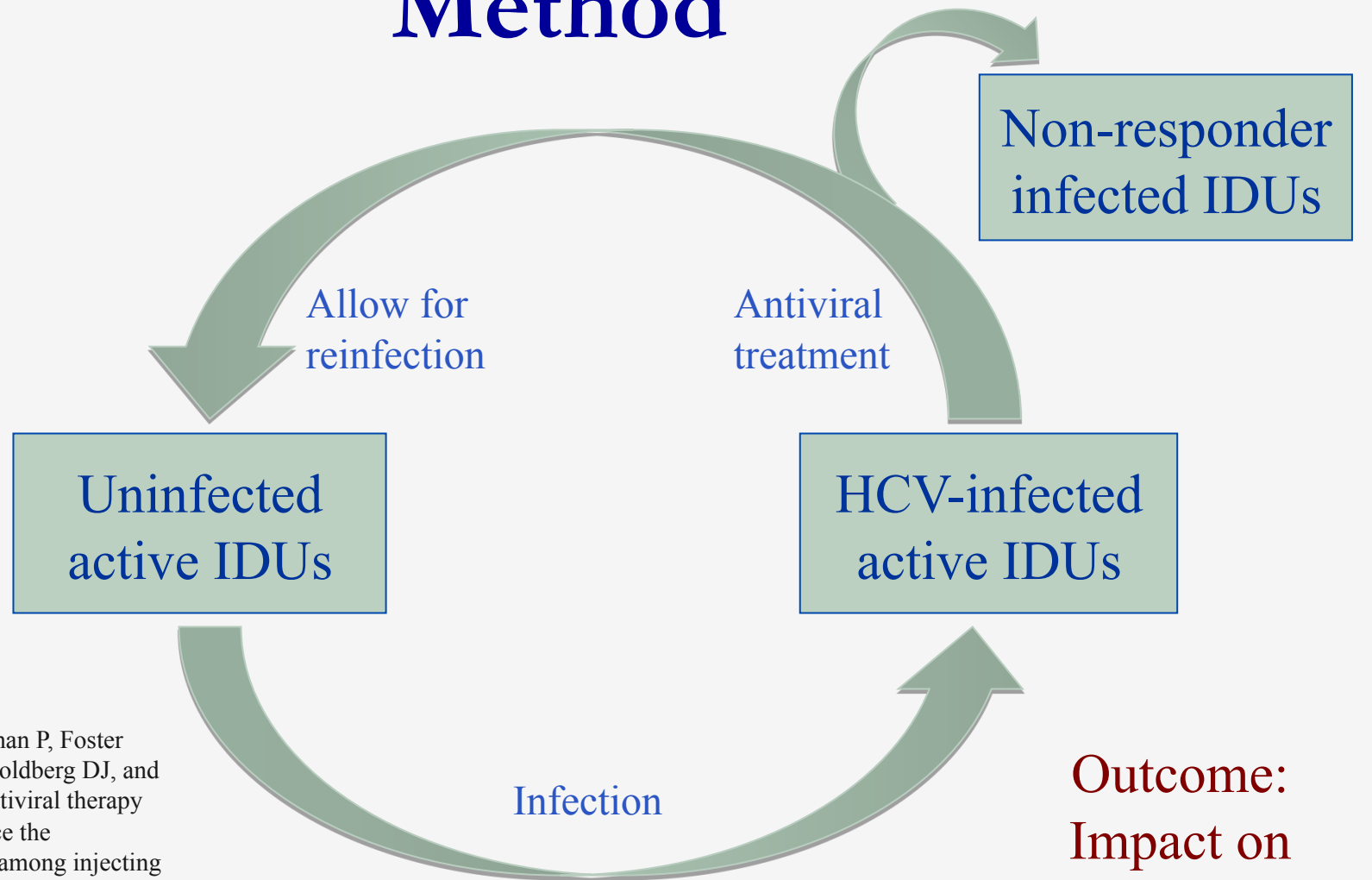
1. Hellard, M., R. Sacks-Davis, and J. Gold. Hepatitis C Treatment for Injection Drug Users: A Review of the Available Evidence. *Clinical Infectious Diseases*, 2009. 49(4): p. 561-573.

2. Dalgard, O., Follow Up Studies of Treatment for Hepatitis C Virus Infection among Injection Drug Users. *Clinical Infectious Diseases*, 2005. 40(s5): p. S336-S338.

Main Questions

- **Can antiviral treatment play a role in preventing HCV transmission by reducing prevalence in the injecting drug user population?**
- **...despite the risk of reinfection?**
- **Are the necessary treatment rates feasible & realistic?**

Method

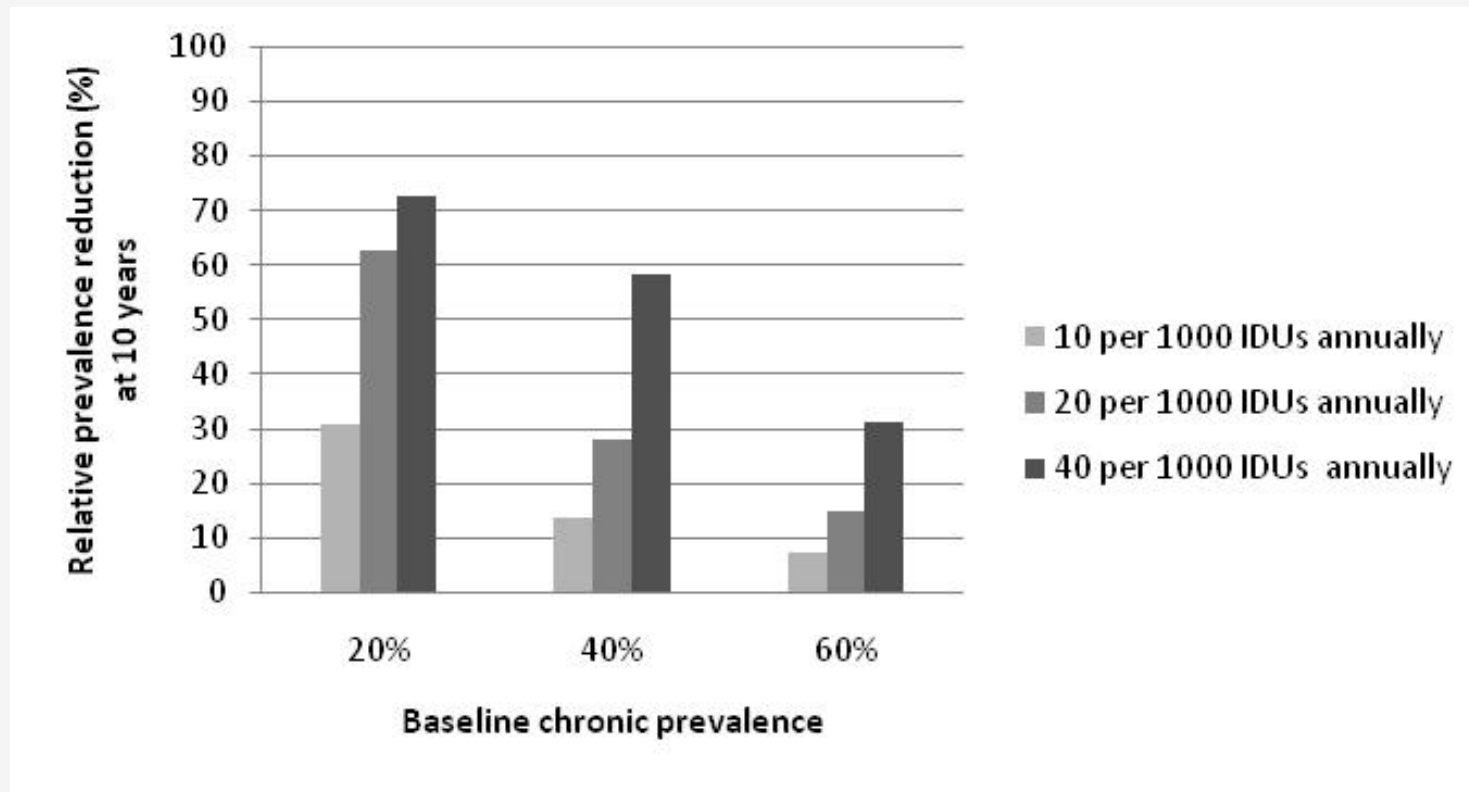


**Outcome:
Impact on
HCV prevalence**

Martin NK, Vickerman P, Foster GF, Huchinson S, Goldberg DJ, and M Hickman. Can antiviral therapy for hepatitis C reduce the prevalence of HCV among injecting drug user populations? A modelling analysis of its prevention utility. *Journal of Hepatology* (in press)

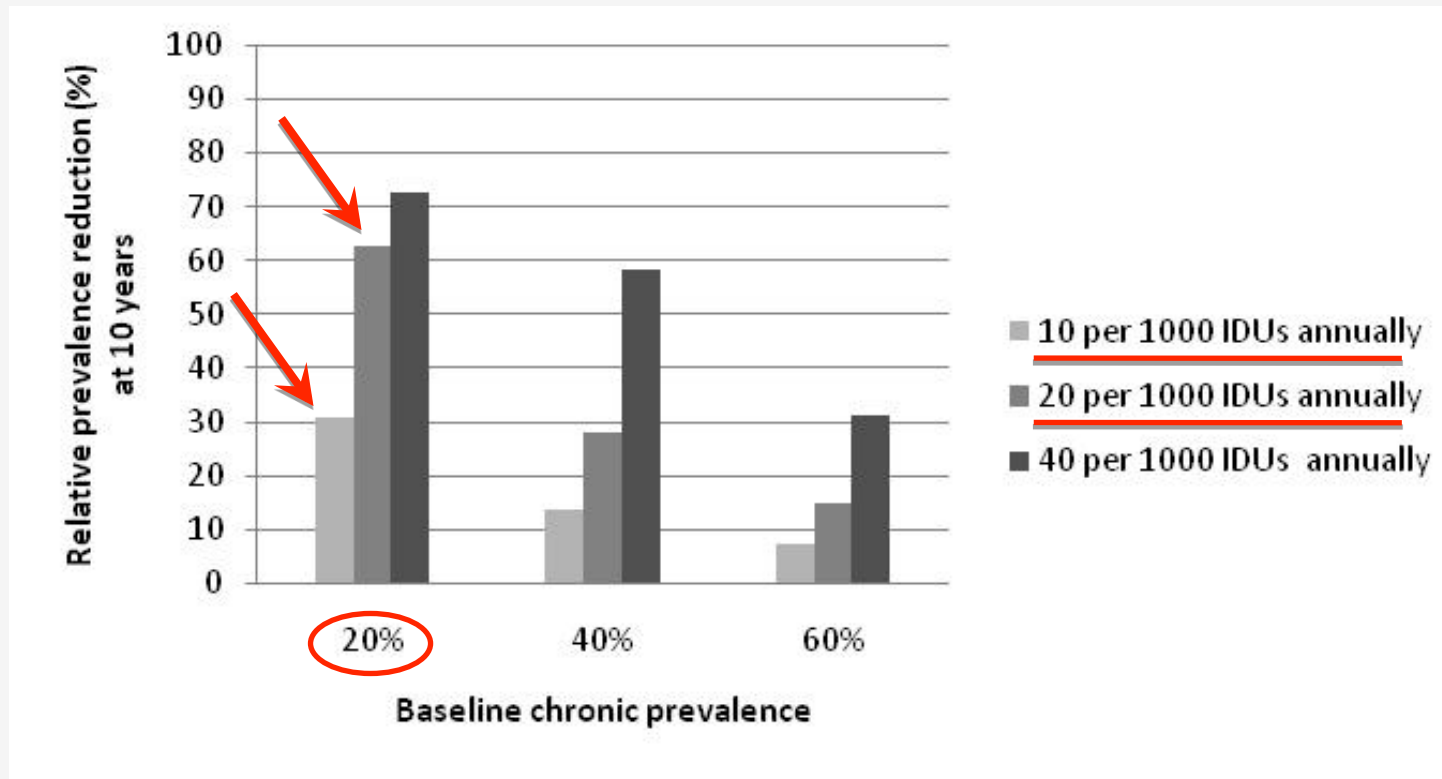
Projections

Relative prevalence reductions at 10 years with varying treatment rates



‘Baseline’: untreated endemic chronic infection prevalence

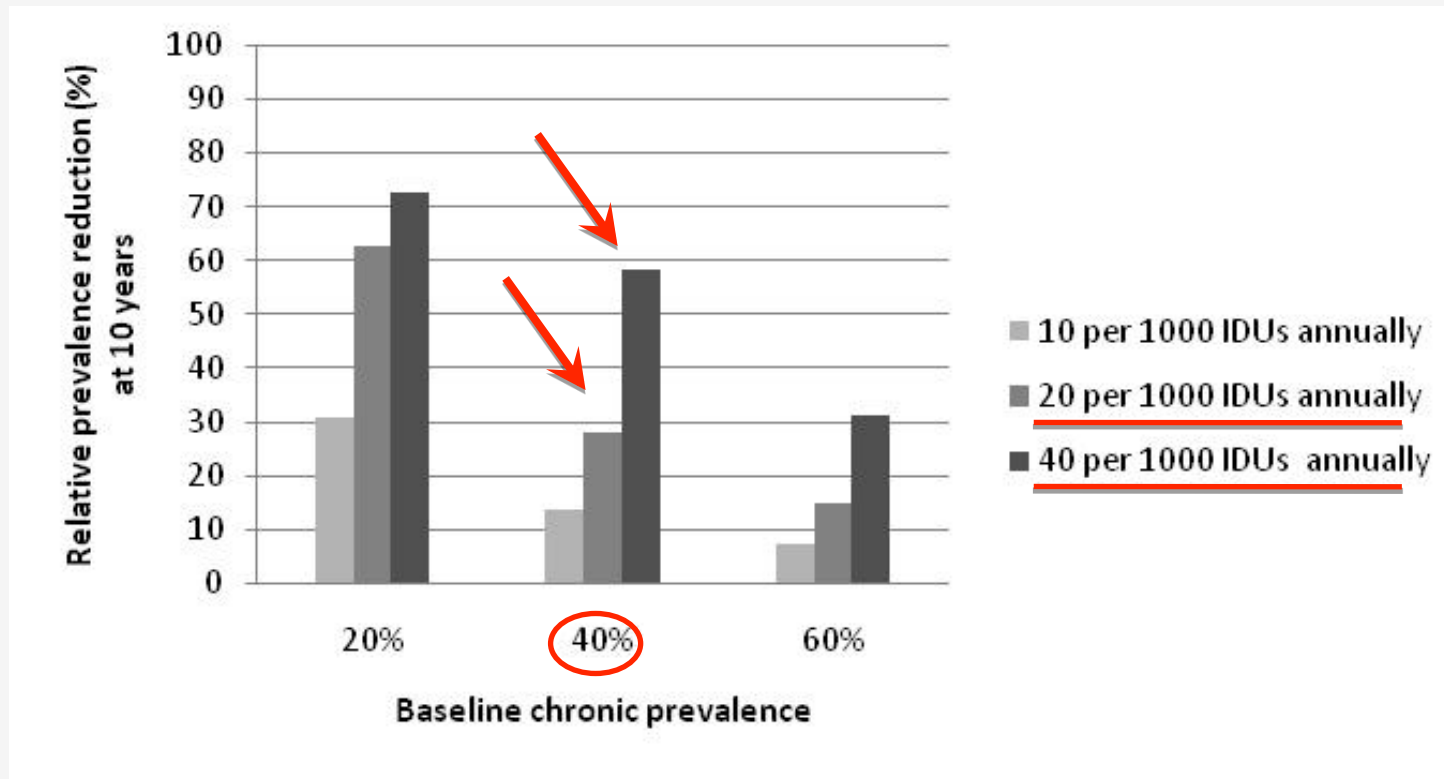
Prevalence reductions at 10 years



Population of 4000 IDUs, 800 infections

- 40 treated annually (10 per 1000 IDUs)
 - 30% reduction by 2020 (20% → 14%)
- 80 treated annually (20 per 1000 IDUs)
 - 62% reduction by 2020 (20% → 8%)

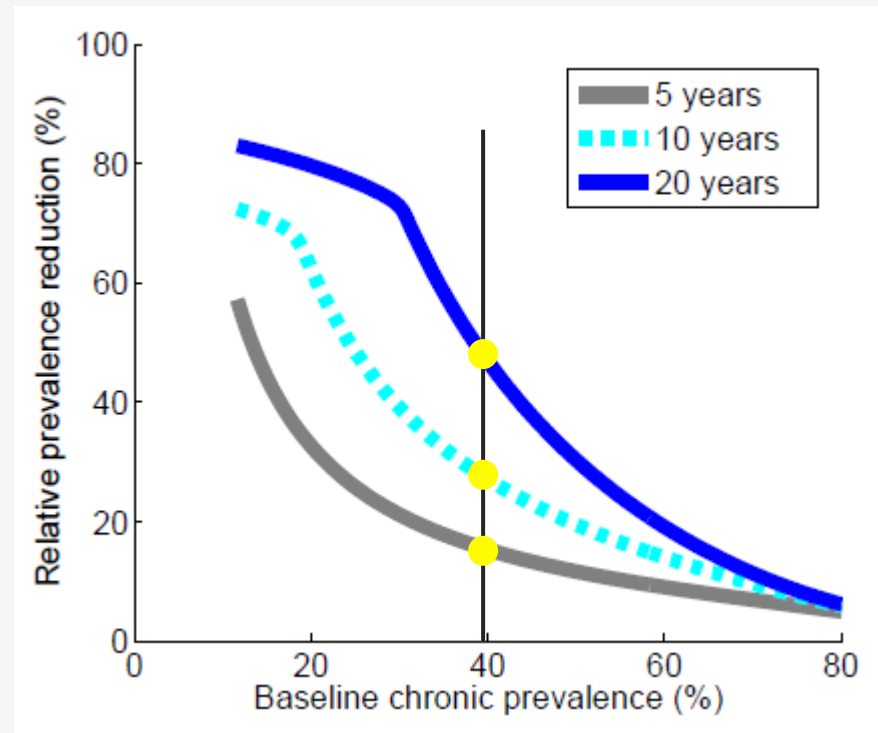
Prevalence reductions at 10 years



Population of 4000 IDUs, 1600 infections

- 80 treated annually (20 per 1000 IDUs)
 - 30% reduction by 2020 (40% → 28%)
- 160 treated annually (40 per 1000 IDUs)
 - 58% reduction by 2020 (40% → 17%)

Model projections through time (5, 10, 20 years) annually treating 20 per 1000 IDUs



- Swift and substantial reductions at low prevalence
- Significant reductions even at high prevalence
- 4000 IDUs, 1600 infected (40% prevalence), 80 treated/yr
 - 15% reduction in 5 years (40 → 34%)
 - 30% reduction in 10 years (40 → 28%)
 - Halved in 20 years (40 → 20%)

Findings & Implications

- Modest & achievable levels of treatment *could* reduce HCV prevalence amongst active IDUs, despite risk of reinfection
- Treatment could play a significant role in prevention of HCV
- Models can generate hypotheses, predict outcomes & set targets...
 - ...but projections are approximations, limited by lack of data informing some parameter values

Key Limitations & Remaining Questions

- Heterogeneity in risk and treatment delivery accessibility:
 - Over an injecting career (homelessness, prison, etc)
 - Across IDU population (high/low risk injectors)
- In some settings active IDUs are being treated, but key question whether IDUs who have an ongoing transmission risk can be treated.