HCV PREVENTION: THE IMPACT OF NEW TREATMENTS AND HARM REDUCTION

Dr. Natasha Martin, Prof. Peter Vickerman,
Prof. Matt Hickman

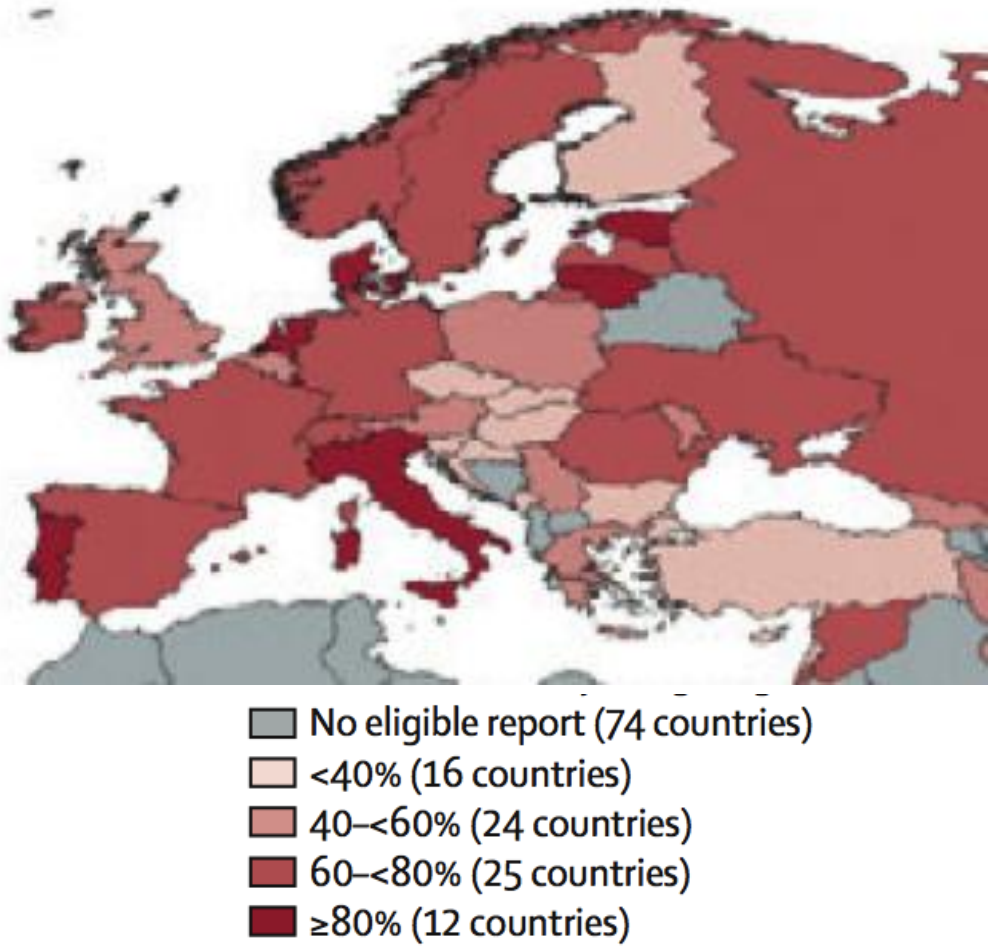
School of Social and Community Medicine
University of Bristol, UK

DISCLOSURES

I have received honoraria to speak at educational sessions and symposia organized by AbbVie, Gilead, and Janssen.

HCV PREVENTION: IMPORTANCE OF PEOPLE WHO INJECT DRUGS (PWID)

- In many European countries, people who inject drugs (PWID) contribute to the majority of HCV transmission
- In the UK, PWID contribute **>90%** new infections
- HCV prevalence among PWID highly heterogeneous, so requires different scale-up of interventions



Nelson et al. *Lancet* 2011
Public Health England Data

UK POOLED EVIDENCE FOR IMPACT OF HARM REDUCTION ON HCV INCIDENCE

- Survey data pooled from England, Wales and Scotland
- Looked at impact of OST and/or exchanging more syringes than you inject (100%NSP) on an individual's risk of recent infection

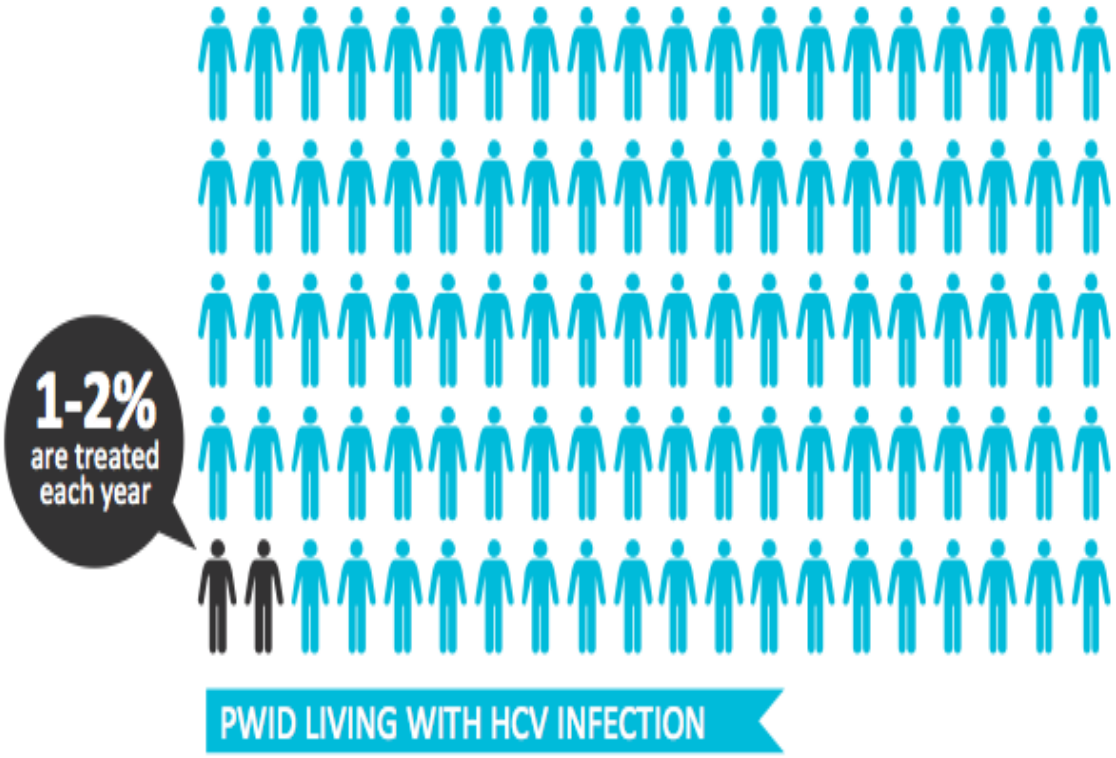
Effect Estimates	**AOR[1]**	95% CI	
>100%NSP	**0.48**	0.3	0.9
OST	**0.41**	0.2	0.8
OST and >100%NSP	**0.21**	0.1	0.5

[1] adjusted for: gender, crack, homeless, injecting duration

100%NSP is defined as exchanging more syringes than you inject

Turner K et al. Addiction 2011; 106:1978-88

PWID ARE THE CORE OF THE HCV EPIDEMIC, BUT FEW PWID ARE TREATED



Grebely J and Dore GJ *Antiviral Research* 2014

DESPITE evidence that:

- PWID achieve similar cure (sustained viral response (SVR)) rates as non/ex-injectors[1-3]
- PWID reinfection rates are low[1,4,5]

[1] Aspinall et al. Clin Infec Dis 2013;57(suppl 2):S80-S89.
[2] Dimova et al. *Clin Infec Dis* 2013;56:806-816.
[3] Hellard, M., et al. *Clin Infec Dis* 2009;49(4):561-573.
[4] Dalgard, O., *Clin Infect Dis* 2005;40(s5):S336-S338.
[5] Grebely et al. J Gastro Hep, 2010;25(7):1281-1284

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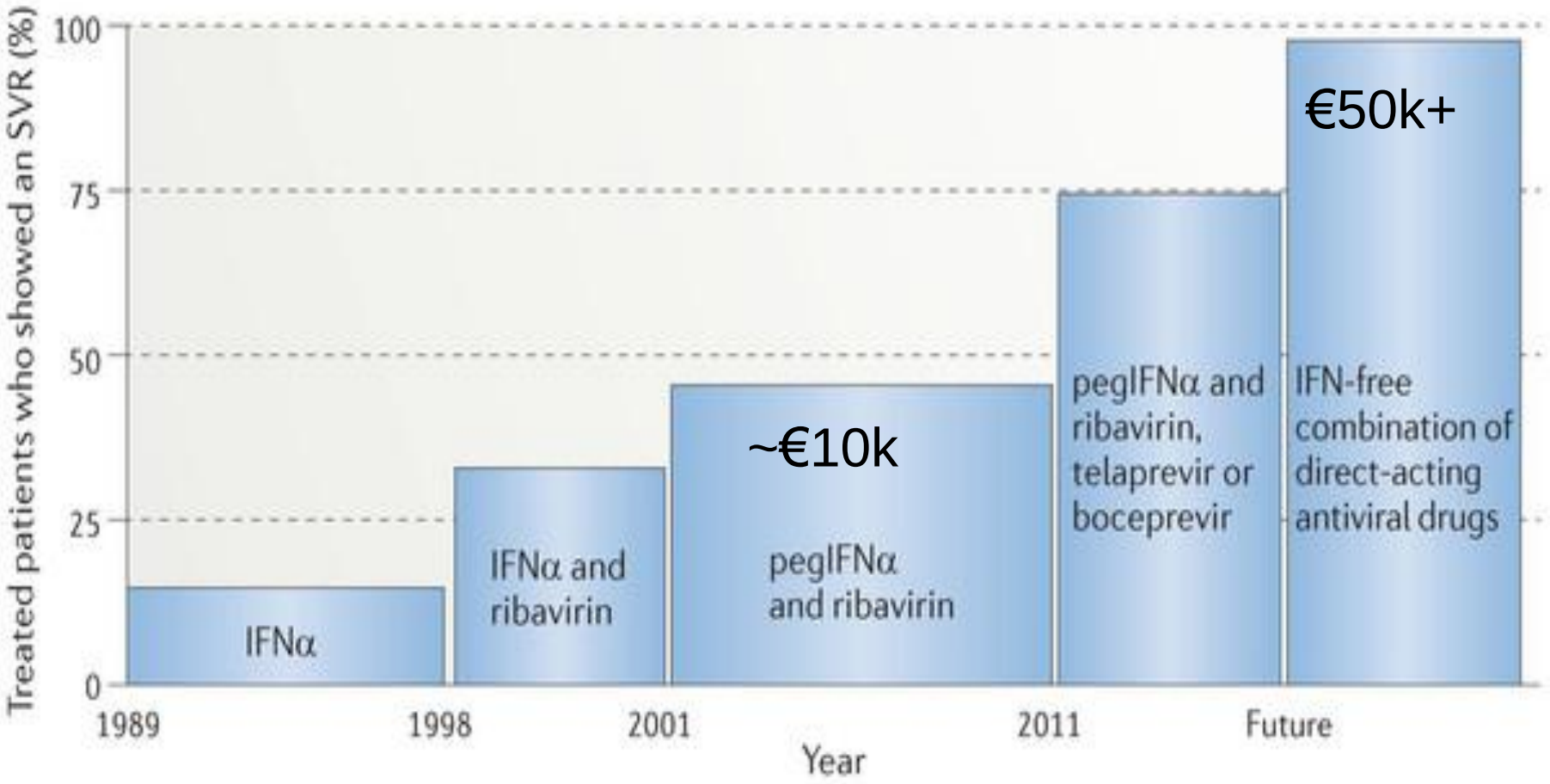
CHANGING HCV TREATMENT LANDSCAPE- INCREASING CURE (SVR) RATES, HIGHER COSTS



Heim M. Nature Reviews Immunology 2013; 13, 535-542.

HIV TREATMENT AS PREVENTION…WHAT ABOUT HCV?

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ORIGINAL ARTICLE

Prevention of HIV-1 Infection with Early Antiretroviral Therapy

Myron S. Cohen, M.D., Ying Q. Chen, Ph.D., Marybeth McCauley, M.P.H., Theresa Gamble, Ph.D., Mina C. Hosseinipour, M.D.,

TREATMENT IS PREVENTION

A scientific breakthrough in 2011 showed that HIV treatment not only saves lives, but reduces the risk by 96% of transmitting the disease.

GUIDELINES

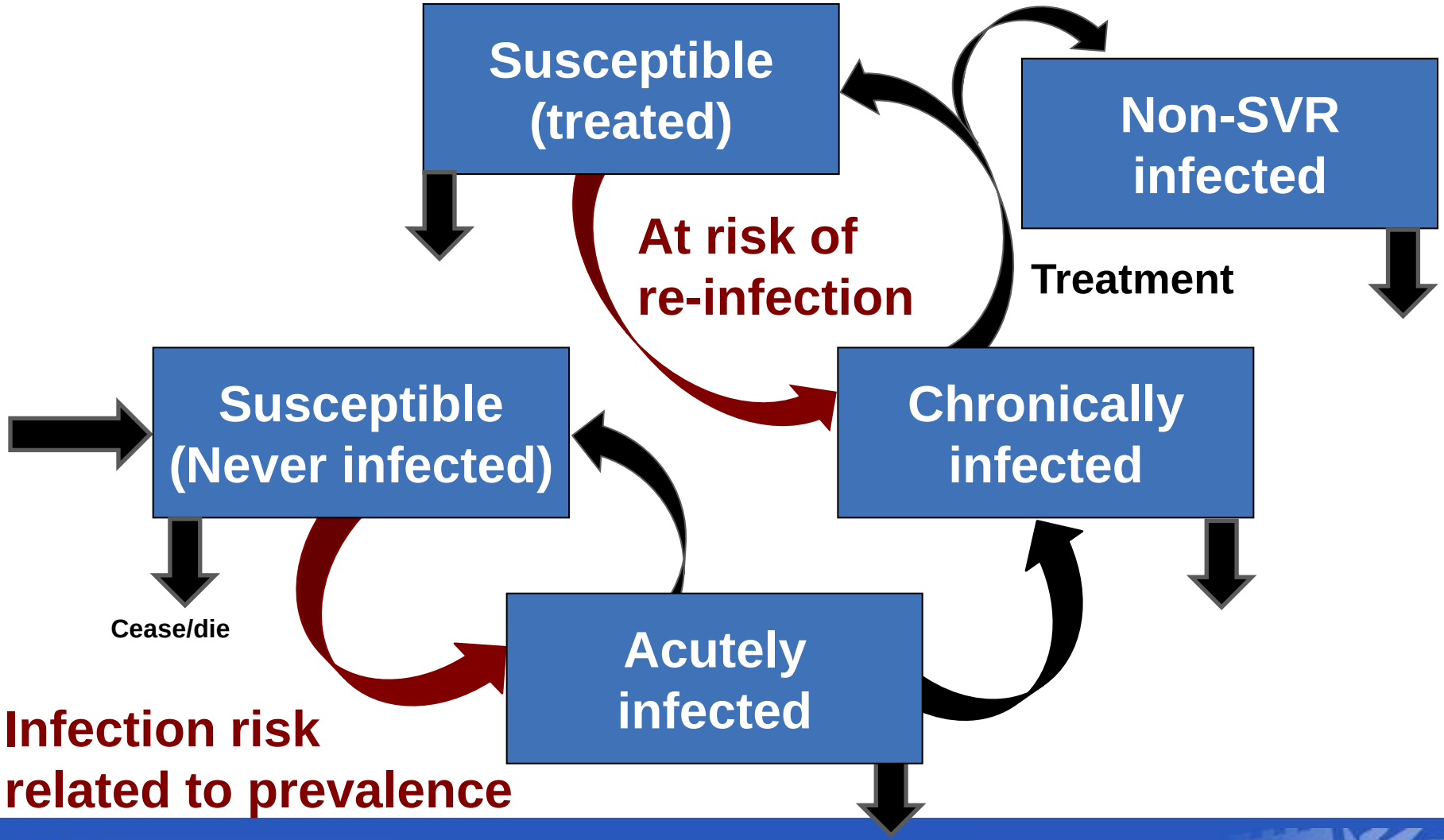
CONSOLIDATED GUIDELINES ON
THE USE OF ANTIRETROVIRAL DRUGS FOR TREATING AND PREVENTING HIV INFECTION

RECOMMENDATIONS FOR A PUBLIC HEALTH APPROACH

JUNE 2013

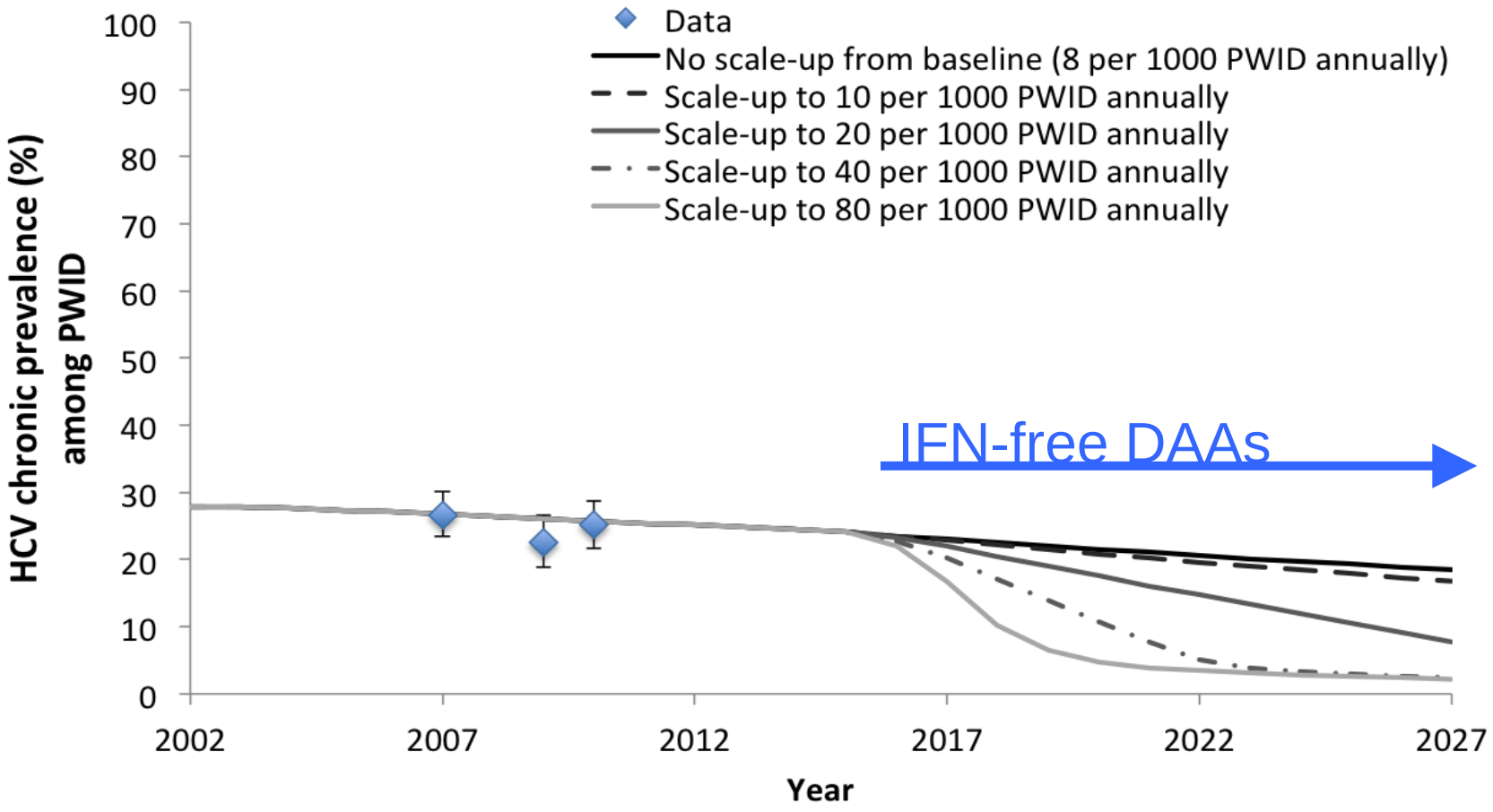
- **AIM: TO USE DYNAMIC TRANSMISSION MODELLING TO ESTIMATE THE REALISTIC IMPACT AND AFFORDABILITY OF HCV TREATMENT FOR PREVENTION WITH DAAS**

A DYNAMIC HCV TRANSMISSION MODEL IS NECESSARY FOR EVALUATING TREATMENT AS PREVENTION



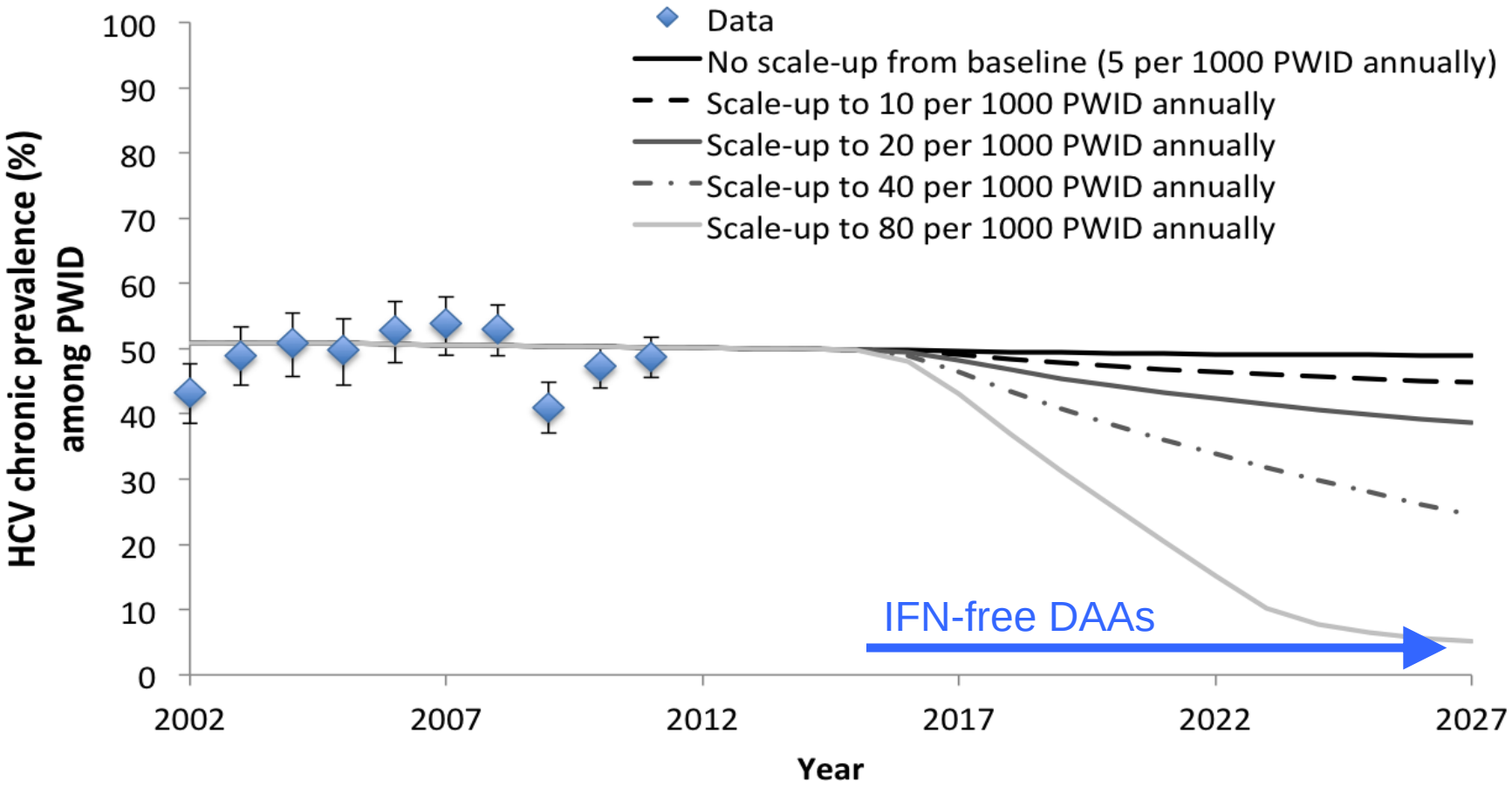
Martin NK, et al. Hepatology. 2012;55:49–57.

MODELLING PROJECTIONS: TOWARDS ELIMINATION IN EDINBURGH WITH DAA THERAPY



Martin NK, Vickerman P, Grebely J, Hellard M, Hutchinson SJ, Lima VD, Foster GR, Dillon J, Goldberg DJ, Dore G, and Hickman M. HCV treatment for prevention among people who inject drugs: modeling treatment scale-up in the age of direct acting antivirals. Hepatology 2013

MODELLING RESULTS: MELBOURNE



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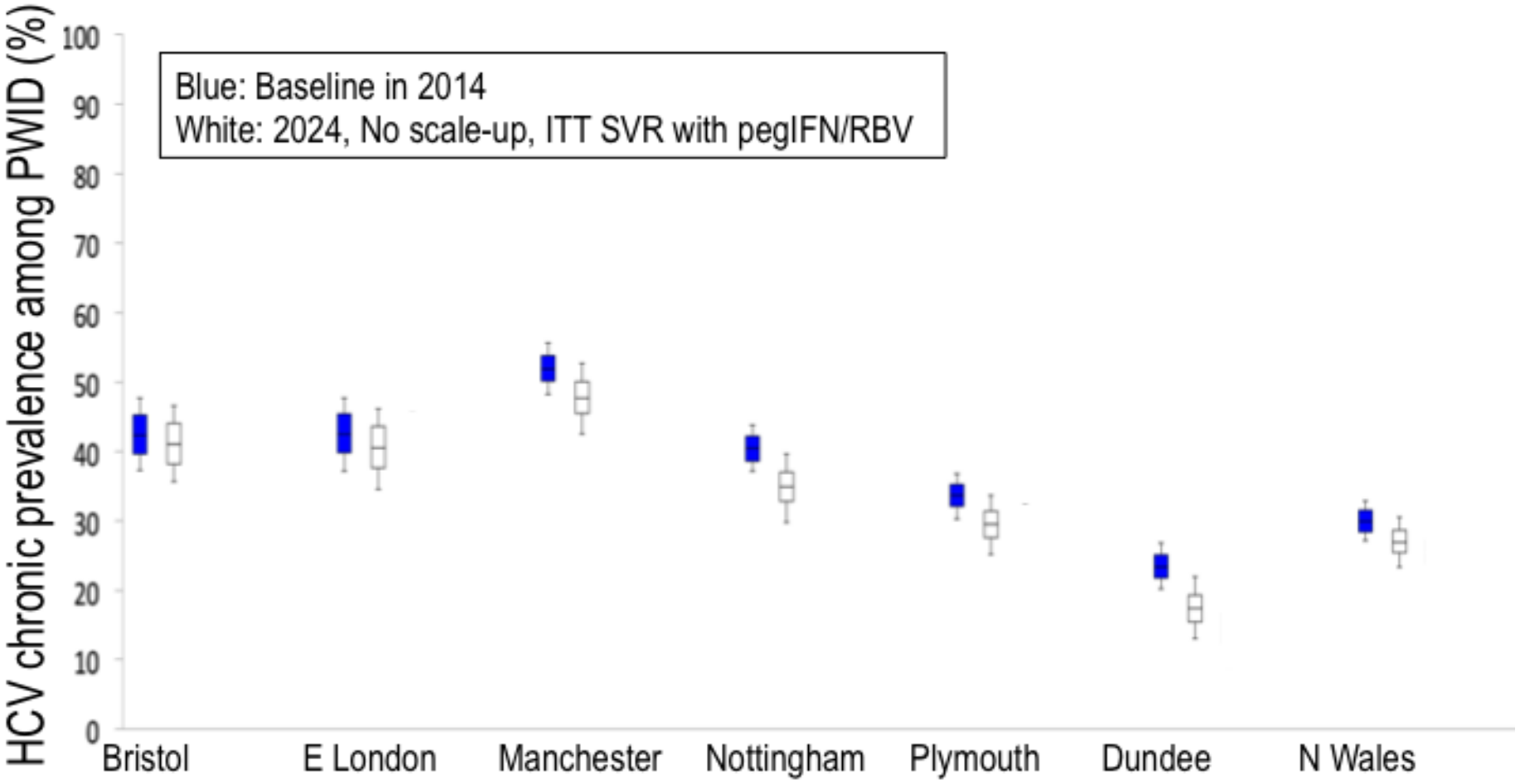
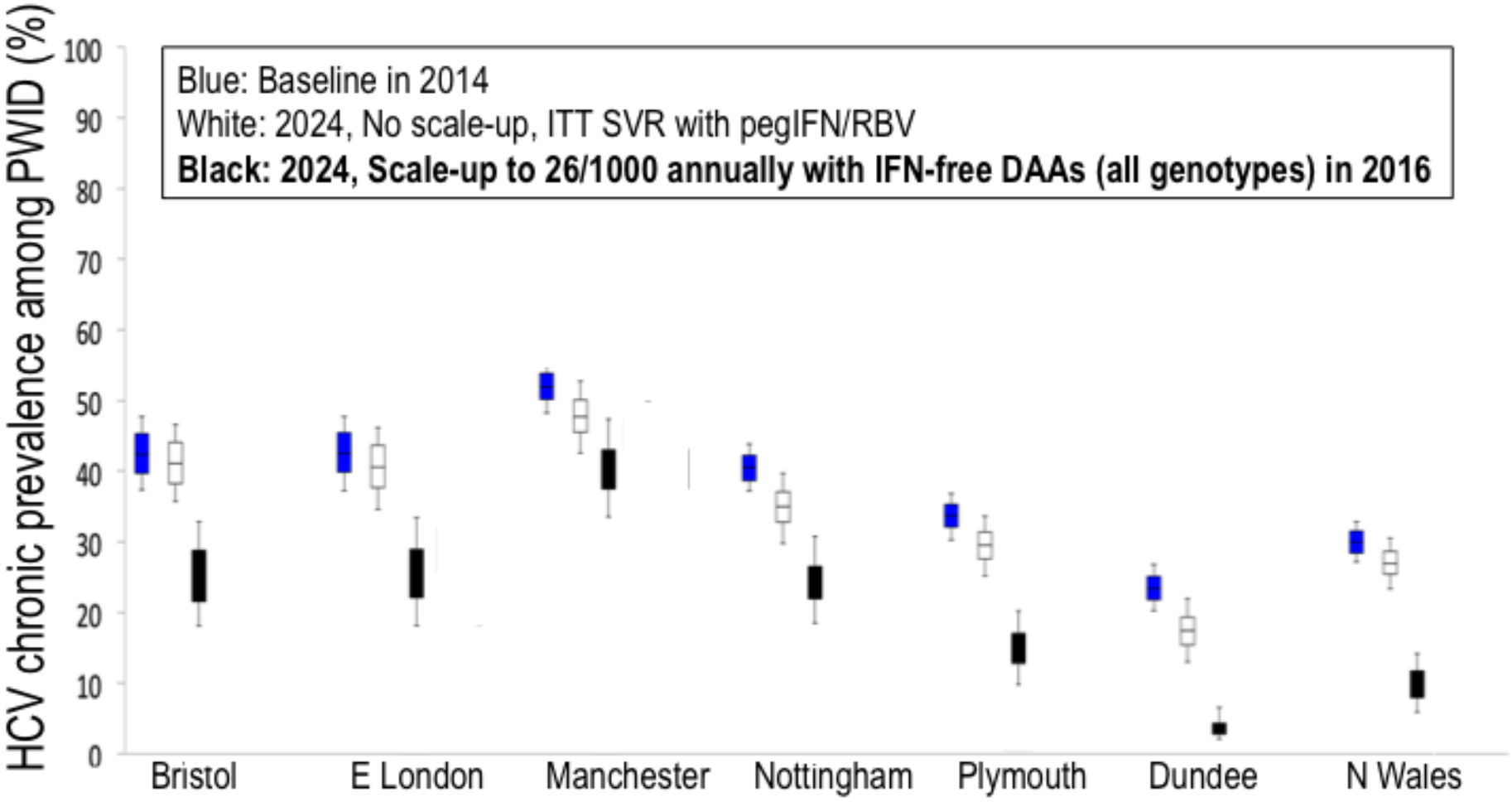
Martin NK, Vickerman P, Grebely J, Hellard M, Hutchinson J, Lima VD, Foster GR, Dillon J, Goldberg DJ, Dore G, and Hickman M. HCV treatment for prevention among people who inject drugs: modeling treatment scale-up in the age of direct acting antivirals. Hepatology 2013

MODELLING PROJECTIONS: CURRENT TREATMENT RATES INSUFFICIENT TO ACHIEVE OBSERVABLE DIFFERENCE IN HCV OVER 10 YEARS



Martin NK, et al. In preparation

MODELLING PROJECTIONS: ACHIEVABLE SCALE-UP WOULD MORE THAN HALVE HCV PREVALENCE WITH NEW DAAs

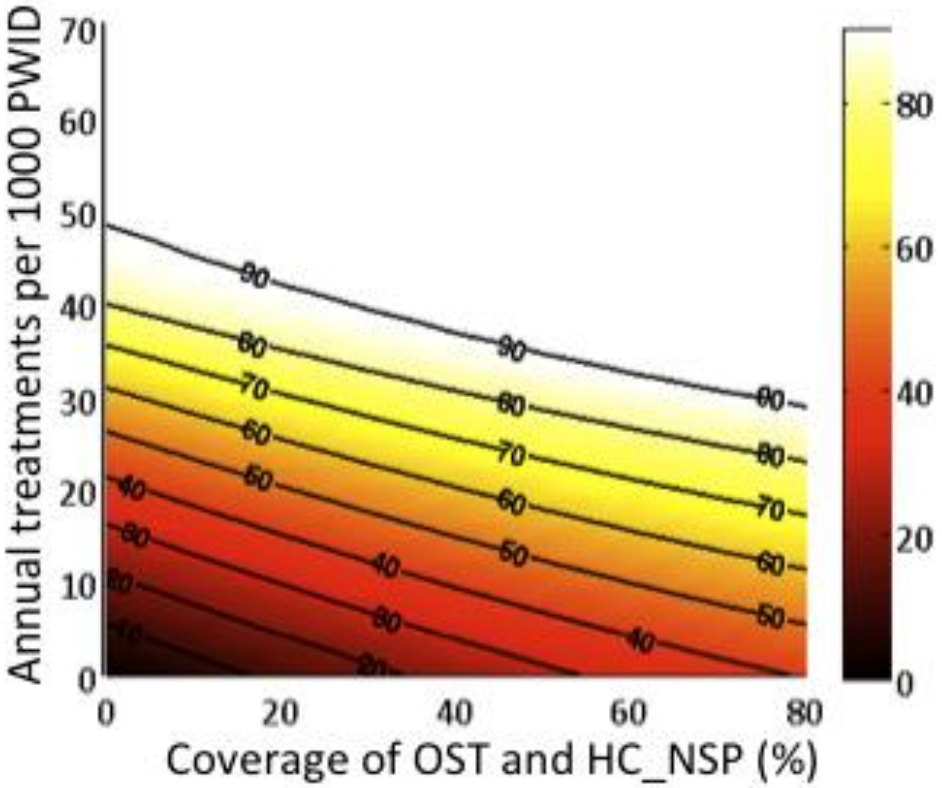


Martin NK, et al. In preparation

CAN WE USE COMBINATION PREVENTION STRATEGIES?

COMBINATION PREVENTION SCALE-UP (OST/NSP/DAAS): 10 YEAR RELATIVE PREVALENCE REDUCTIONS WITH NO BASELINE COVERAGE OF OST/NSP AND USING DAAs

40% chronic prevalence



- Dark red: modest (<20%) impact, high HCV
- Orange: ~50% impact
- White: >80% impact

- >40% reduction requires HCV treatment
- OST/NSP reduces required treatment numbers

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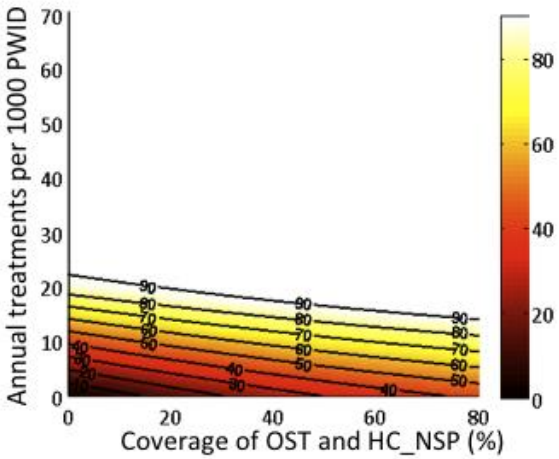
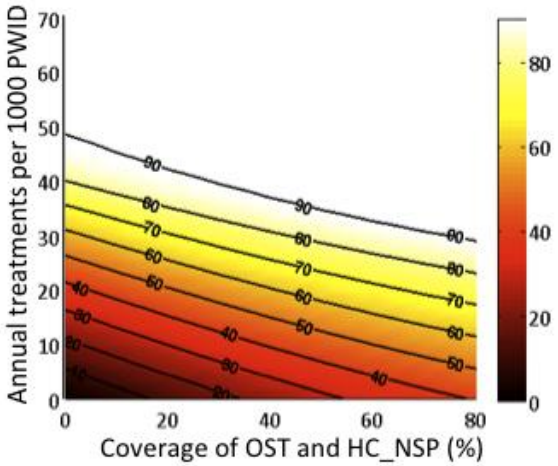
Martin NK, Hickman M, Hutchinson SJ, Goldberg DJ, and Vickerman P. Combination interventions to prevent HCV transmission among people who inject drugs: modelling the impact of antiviral treatment, needle and syringe programmes, and opiate substitution therapy. Clinical Infectious Diseases 2013

10 YEAR RELATIVE PREVALENCE REDUCTIONS WITH COMBINING OST/NSP/TREATMENT: NO BASELINE COVERAGE OF OST/NSP AND USING DAAs

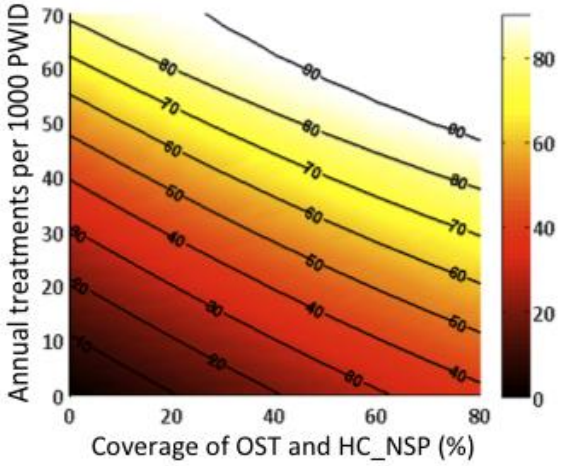
20% chronic prevalence



40% chronic prevalence



60% chronic prevalence



- Large (>40%) reductions in prevalence require treatment in all settings

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CONCLUSIONS

- HCV transmission and prevalence/incidence can be reduced to negligible levels
  - Requires scaling up HCV treatment in combination with OST and NSP
- But is treatment scale-up affordable at current prices?
  - European bulk buying to support treatment as prevention?

IMPLICATIONS - EUROPE

- In settings with ageing PWID epidemics, treatment as prevention may have less of an impact
- Need to consider other forms of transmission which may be significant in Europe, and whether treatment as prevention will be an effective/cost-effective strategy among these groups
- In settings where there is minimal diagnosis, need to identify ways to increase case-finding
- Need better epidemiological data to reduce key uncertainties: PWID population size estimates, incidence of non-PWID transmission/other risk groups, HCV treatment rates among risk groups

LIMITATIONS/FUTURE WORK

- Theoretical modelling projections- no empirical data treatment can reduce HCV prevalence
- Need modelling work to assess treatment scale-up levels and targeting strategy to optimise BOTH prevention/reduction of ESLD & HCV transmission
- Need more cost-effectiveness evaluations of HCV screening/case-finding and treatment programmes among high risk groups, including prevention benefits
- Dynamic models needed to determine local and national targets

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International PWID projections: Greg Dore, Jason Grebely, Margaret Hellard, Viviane Dias Lima

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