Kirby Institute

AIDS 2018 22ND INTERNATIONAL AIDS CONFERENCE AMSTERDAM, NETHERLANDS 23-27 JULY 2018

BREAKING BARRIERS • BUILDING BRIDGES

Will hepatitis C transmission be eliminated by 2025 among HIV-positive men who have sex with men in Australia?

Luisa Salazar-Vizcaya[1*], David C Boettiger[2*], Gregory J Dore[1], Richard T Gray[1], Matthew Law[1], Andri Rauch[2], Toby Lea[3] and Gail Matthews[1]

[1]Department of Infectious Diseases, Bern University Hospital, Switzerland

[2]The Kirby Institute, UNSW Sydney, NSW, Australia

[3]Centre for Social Research in Health, UNSW Sydney, NSW, Australia

*Equal contribution

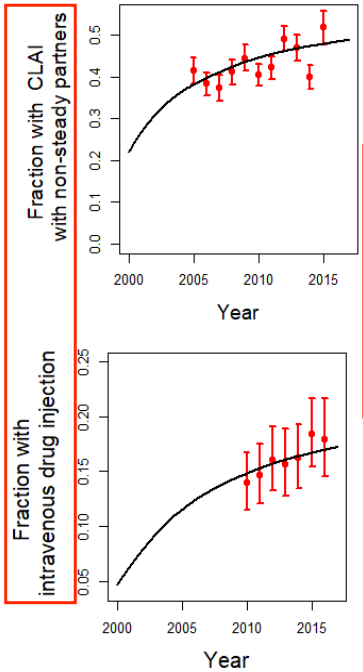
INSELSPITAL
UNIVERSITÄTSSPITAL BERN
HÔPITAL UNIVERSITAIRE DE BERNE

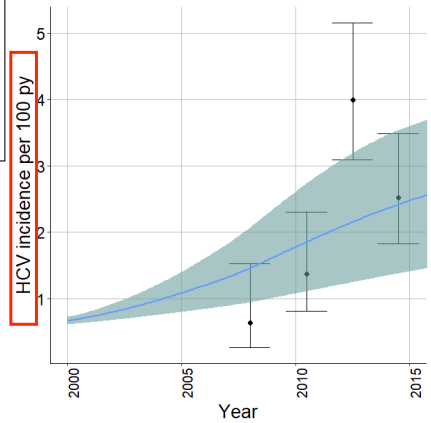
Disclosures

- Gilead travel grant

HCV among men who have sex with men (MSM) in Australia

The rise[1]





CLAI: condomless anal intercourse

Direct-acting antivirals (DAA) for everyone since 2016

Control and Elimination within AuStralia of HEpatitis C from people living with HIV (CEASE)

- "CEASE is a major national collaborative venture with the ultimate aim of **controlling and eliminating HCV infection from the Australian HIV positive population**" [2].
- " …unrestricted access will allow **rapid scale-up of treatment**. … **prevent further infections** …" [2].

[1] Danta *et al, AIDS 2007;* van de Laar *et al, AIDS 2010;* van de Laar *et al,* Gastroenterology 2009; [2]https://kirby.unsw.edu.au/project/cease

HCV among MSM in Australia

The questions

- Can Australia meet the 80% WHO reduction target by 2025*?
- Under which circumstances?

The tools

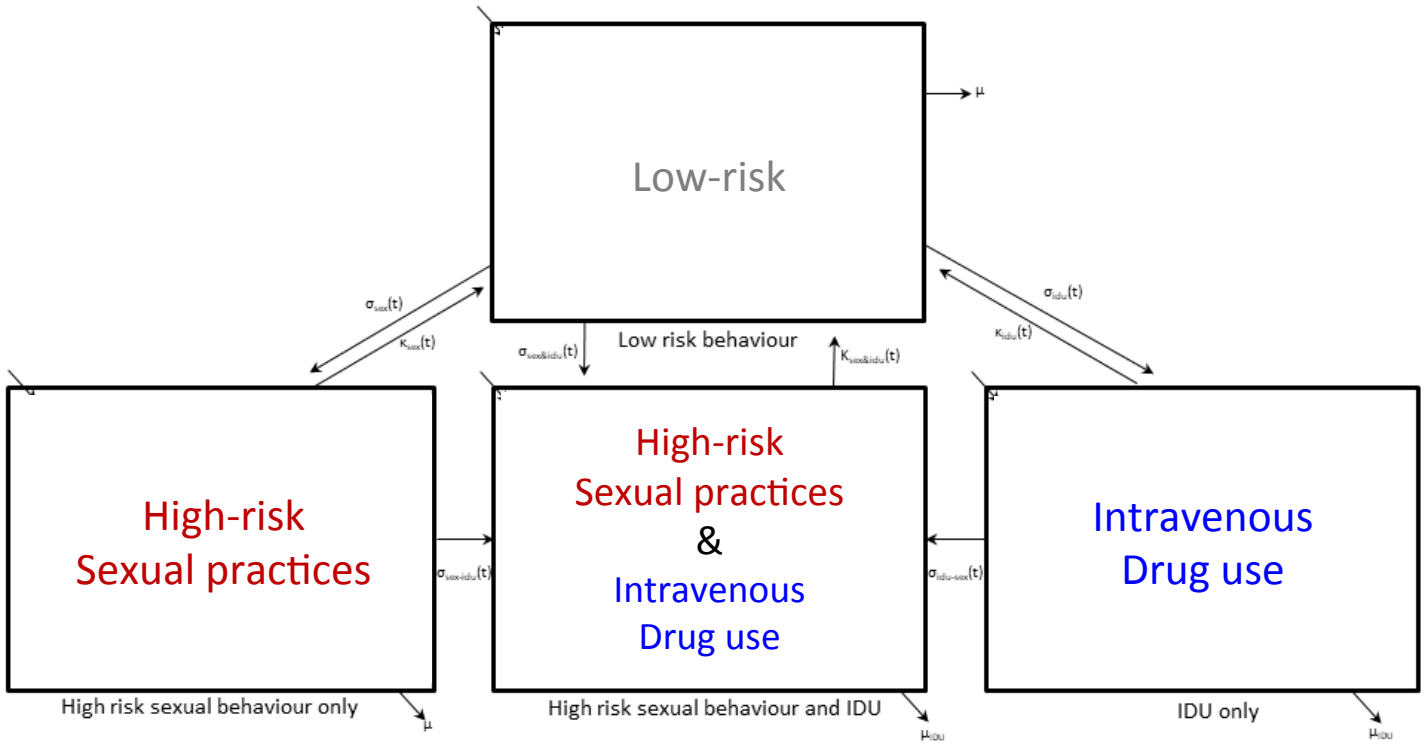
- Mathematical model of HCV transmission

- Reproduces observations and produces projections given scenarios

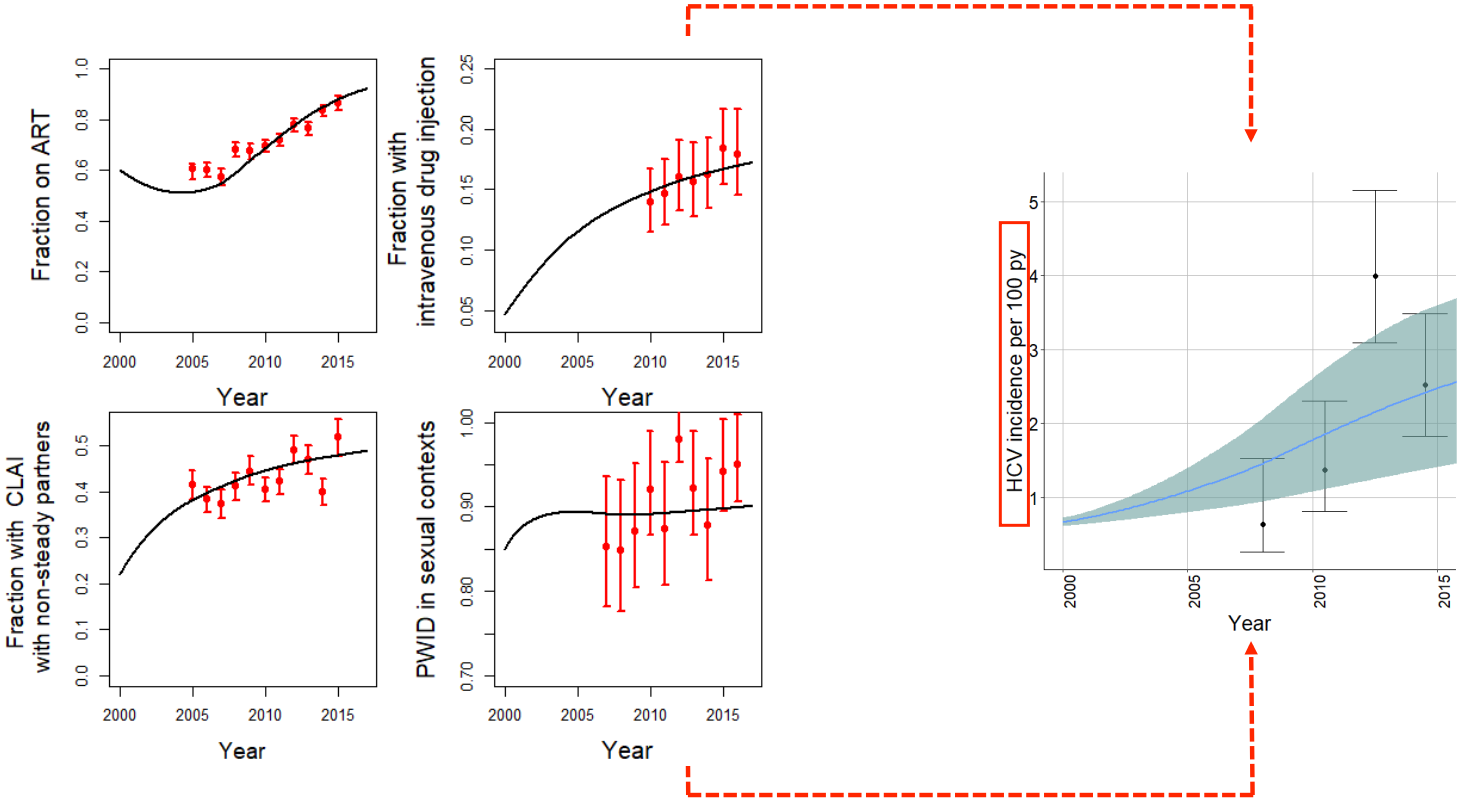
*With 2016 modelled incidence as reference

Two drivers of transmission

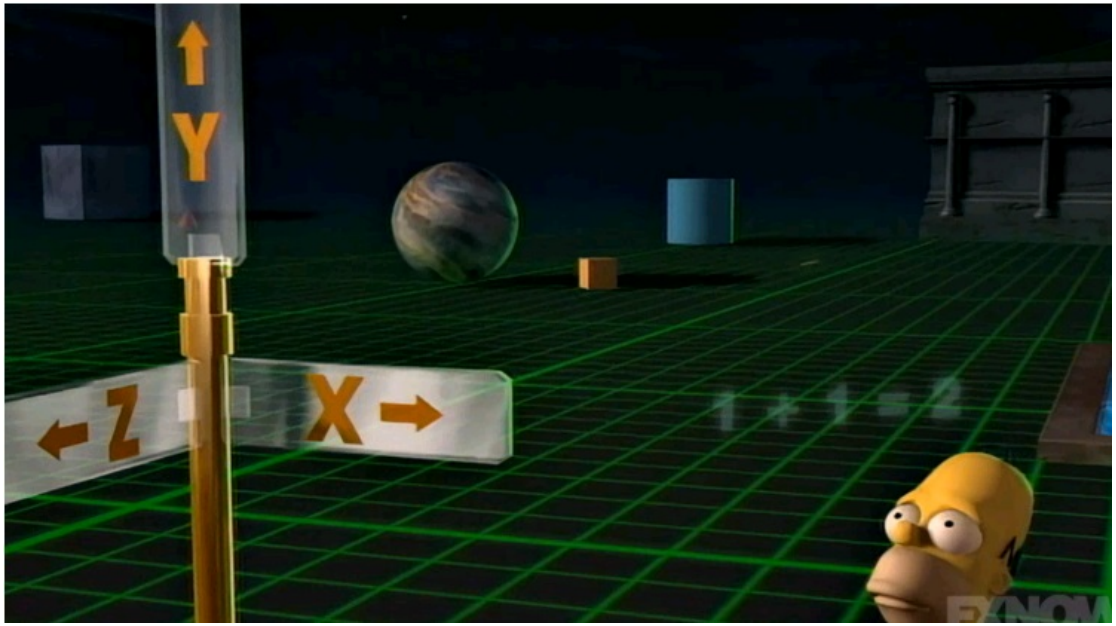
Intravenous drug use and sexual practices



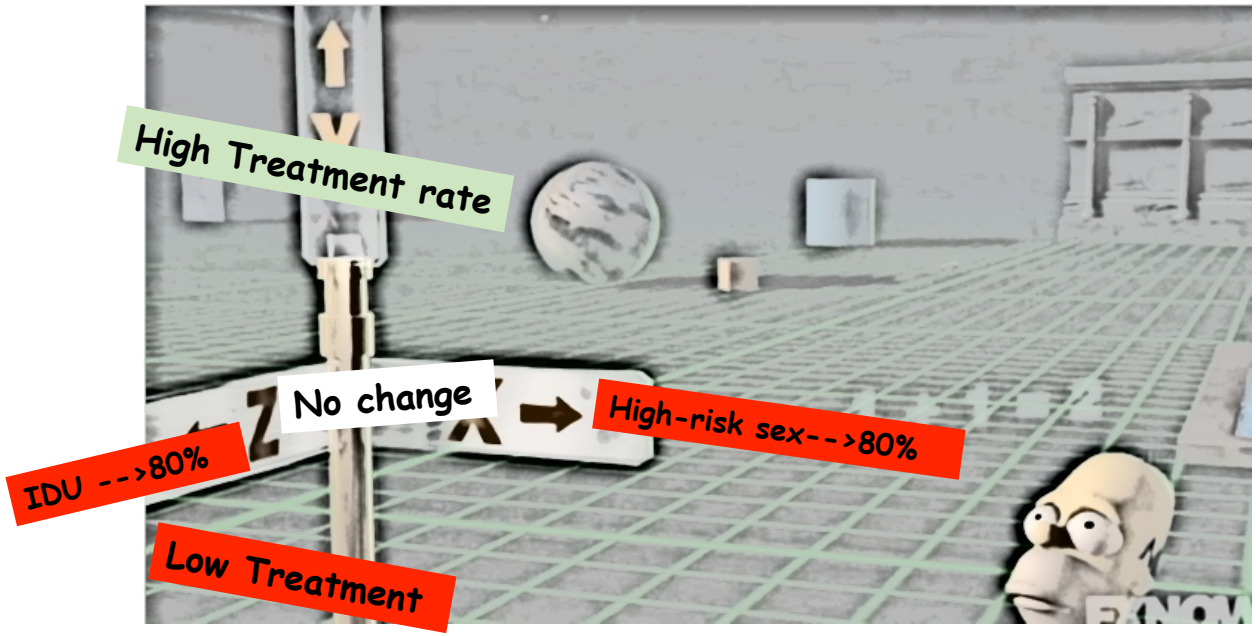
Population dynamics & HCV incidence



The future of behaviour and treatment



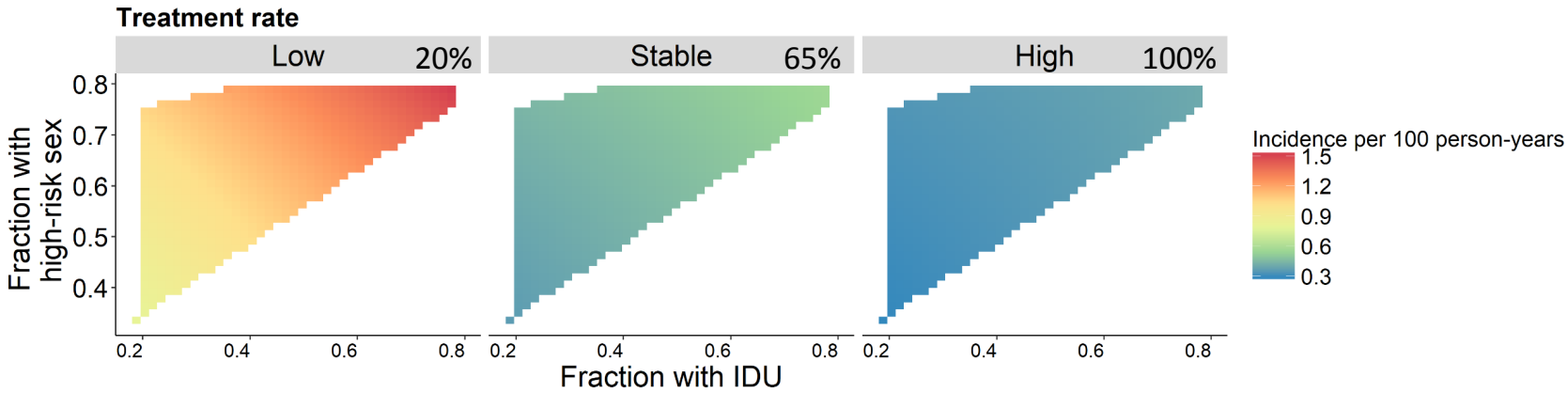
The future of behaviour and treatment



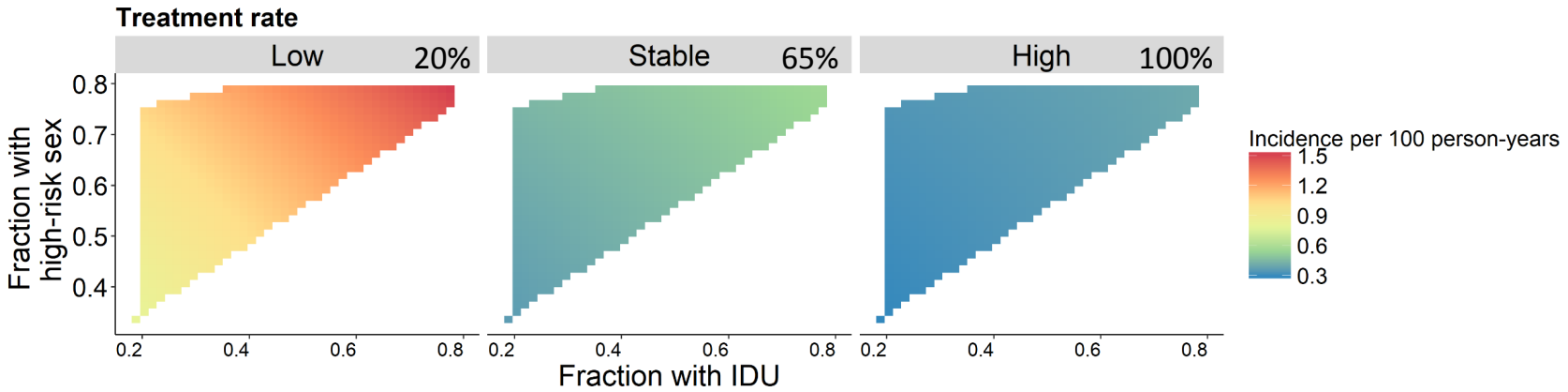
Treatment scenario*	Rate in 2025 (per year)
Low rate	20%
Stable rate	65%
High rate	100%

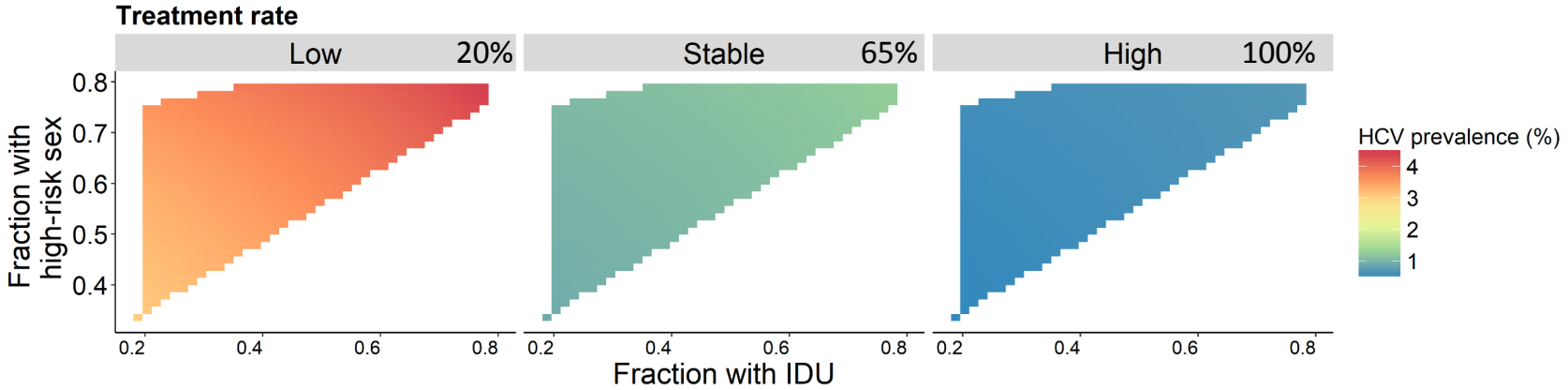
*Continued dicrease/increase until 2025

Along the behavioural spectrum - 2025

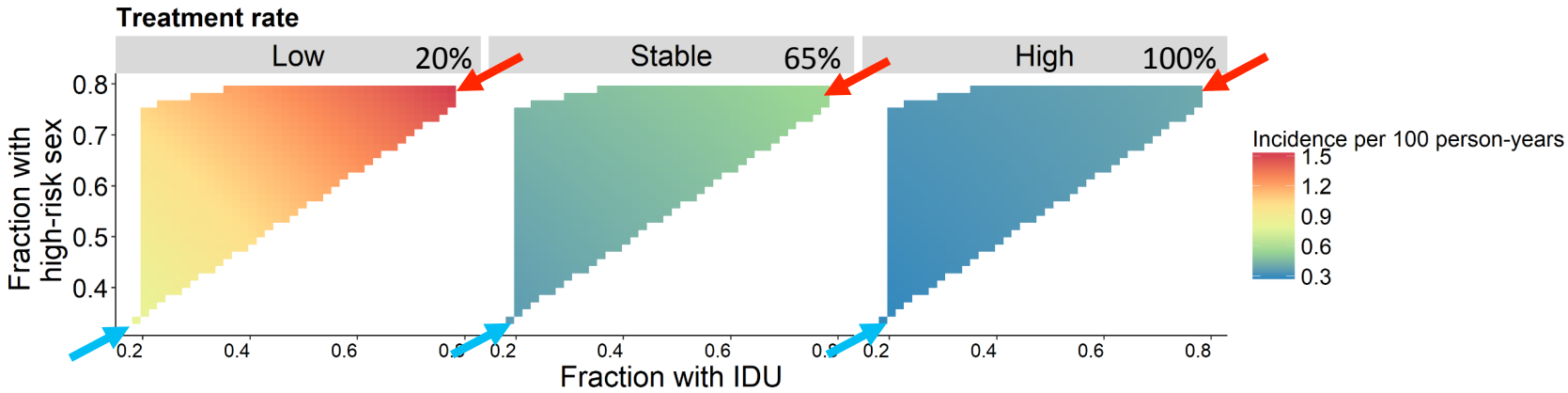


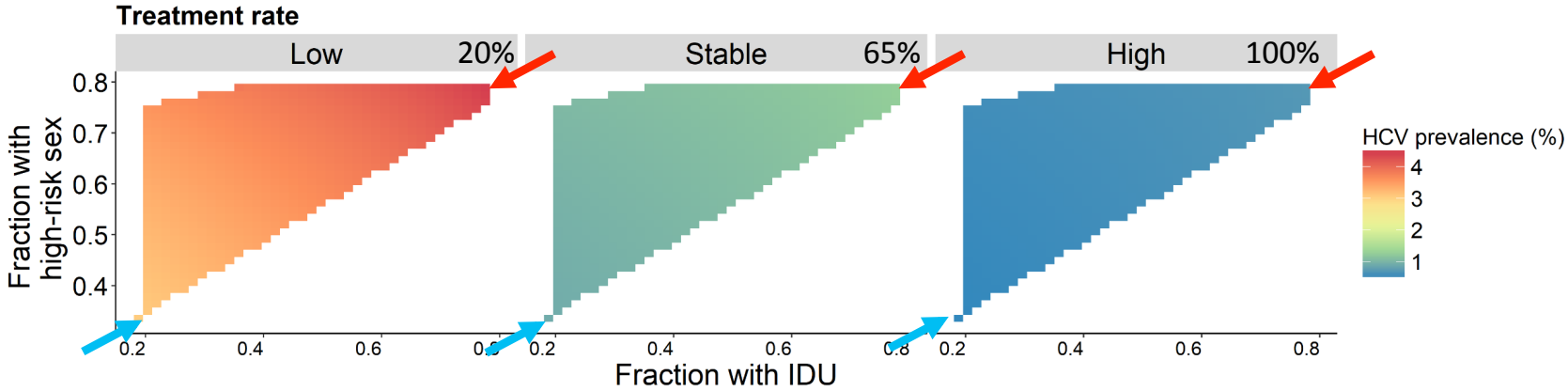
Along the behavioural spectrum - 2025



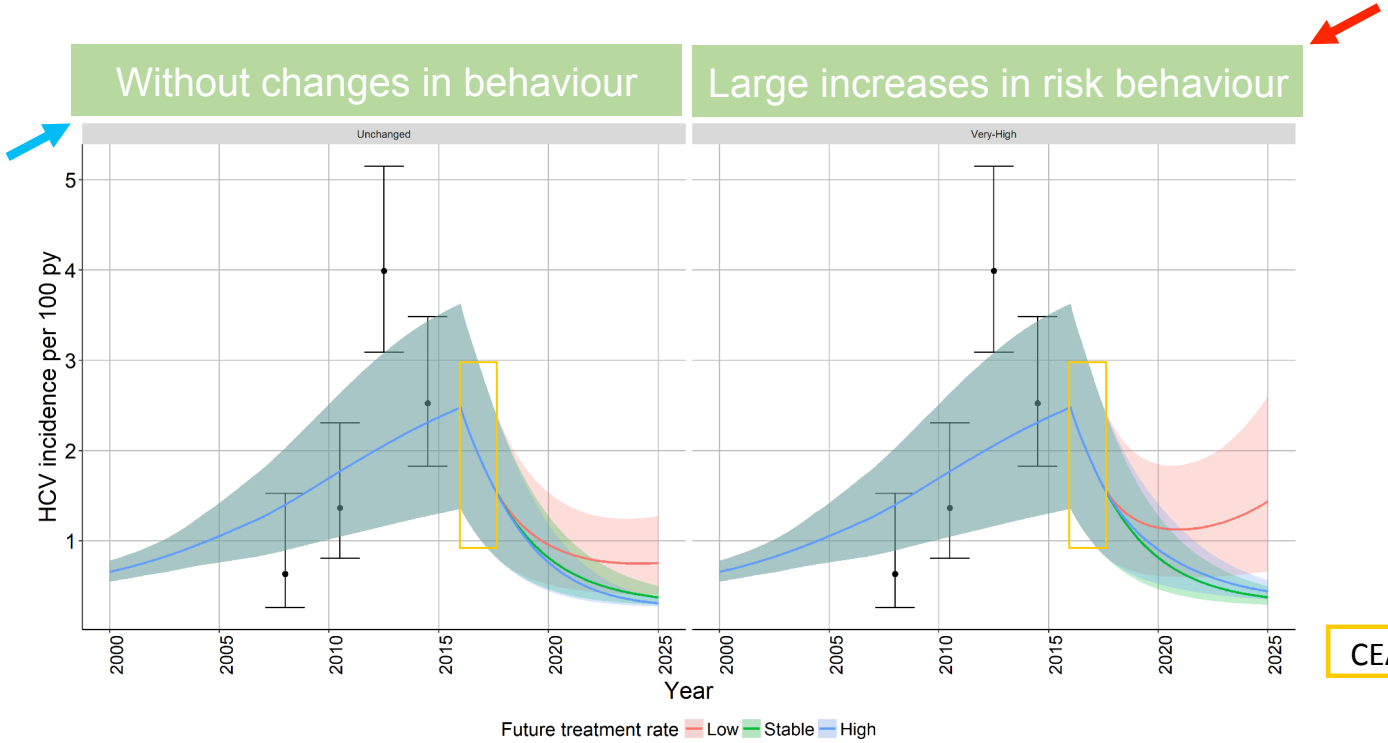


Along the behavioural spectrum - 2025





Declining incidence regardless of behaviour?



CEASE: 65%/year

WHO 80% reduction target by 2025

Exposure to transmission - Risk behaviour	**Unchanged***																			
Treatment rate	**Low****							**Stable****							**High****					
Impact of treatment in PWID - reduction in incidence by 2025	10%		50%			90%^		10%		50%			90%^		10%		50%			90%^
ratio High-risk sex CLAI with ocassional partners	65%		65%		50%	65%	80%	65%		65%		50%	65%	80%	65%		65%		50%	65%	80%
WHO goal								***		***		***	***	***	***		***			

Exposure to transmission - Risk behaviour	**Very high**																			
Treatment rate	**Low****							**Stable****							**High****					
Impact of treatment in PWID - reduction in incidence by 2025	10%		50%			90%^		10%		50%			90%^		10%		50%			90%^
ratio High-risk sex CLAI with ocassional partners	65%		65%		50%	65%	80%	65%		65%		50%	65%	80%	65%		65%		50%	65%	80%
WHO goal								***		***		***	***	***	***		***		***	***	***

*Unchanged: IDU :=18.9, High-risk sex = 32.7%; **Rate by 2025:low :=0.2, stable := 0.65, high :=1.0; 95% confidence interval overlaps with lower reductions; ^main analyses

Projected to be met
Projected not to be met

Conclusions

- The model suggests that HCV transmission among Australia's HIV-positive men who have sex with men will continue
- but continue to decline with DAA treatment upscale, even in the context of increased risk behaviour
- If treatment remains high or continues to increase, by 2025 Australia could meet the 80% reduction goal formulated by the WHO

Outlook

- Monitoring of «real-life» outcomes of CEASE versus model projections

Acknowledgments

All patients and workers affiliated with:

- Australian HIV Observational Database
- The Control and Elimination within Australia of Hepatitis C from people living with HIV study (CEASE)
- The Australian HIV Annual Surveillance Report
- The Australian Collaboration for Coordinated Enhanced Sentinel Surveillance
- The Australian Gay Periodic Survey
- The Australian Needle and Syringe Survey
- The Flux study.

Funding

DB was supported by a Gilead Sciences Australia fellowship

LSV was supported by the Swiss National Science Foundation (SNSF) grant # 146143