



## HCV Estimates and Projections

**Amy Kwon<sup>1</sup>, Greg Dore<sup>1</sup>, Jason Grebely<sup>1</sup>,  
Behzad Hajarizadeh<sup>1</sup>, Rebecca Guy<sup>1</sup>, Evan Cunningham<sup>1</sup>,  
Chris Estes<sup>2</sup>, Homie Razavi<sup>2</sup>, Richard Gray<sup>1</sup>, and  
HCV estimates and projections reference group**

1. Kirby Institute, UNSW Australia, Sydney, New South Wales 2052, Australia

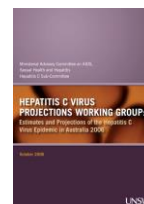
2. Centre for Disease Analysis, Louisville, CO, USA

11/08/2017



### Overview

- In 2015, 227,000 people were living with chronic HCV
- Estimated 32,400 individuals initiated direct acting antiviral (DAA) in 2016 in Australia
- Last estimates and projections report was released in late 2006<sup>1</sup>
  - This project aims to extend and update those estimates
  - Establish baseline at start of DAA treatment era
- Aim to update future impact of DAA program in reducing the prevalence, transmission, and morbidity of chronic HCV to evaluate whether Australia can meet WHO HCV elimination targets



## BRISE HCV Estimates and Projections Project

- Part of BBV & STI Research, Intervention and Strategic Evaluation Program ([www.brise.com.au](http://www.brise.com.au))



- Kirby Institute funded by NSW Health to coordinate and conduct a study to estimate the prevalence, incidence and disease burden of hepatitis C.

- Used previously developed HCV model developed by Centre for Disease Analysis (<http://centerforda.com/>)

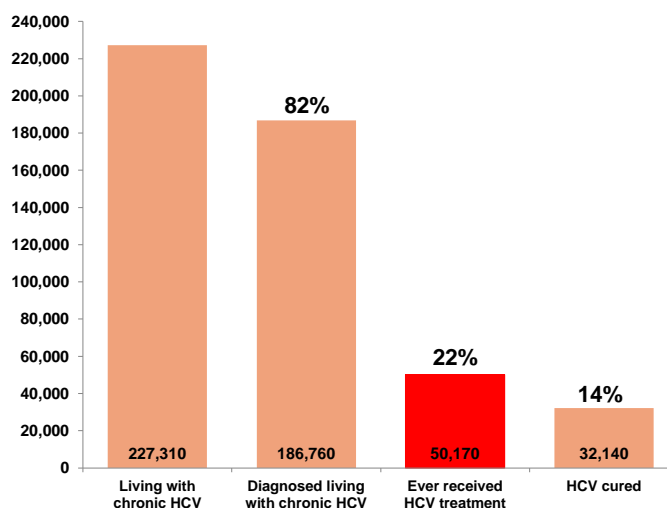


- CDA BRIGHT model

- Previously used in >65 countries, including Australia, with many publications.

- Razavi H, et al. The present and future disease burden of hepatitis C virus (HCV) infection with today's treatment paradigm. Journal of viral hepatitis 2014; 21:34–59.

## HCV care cascade in Australia: end 2015



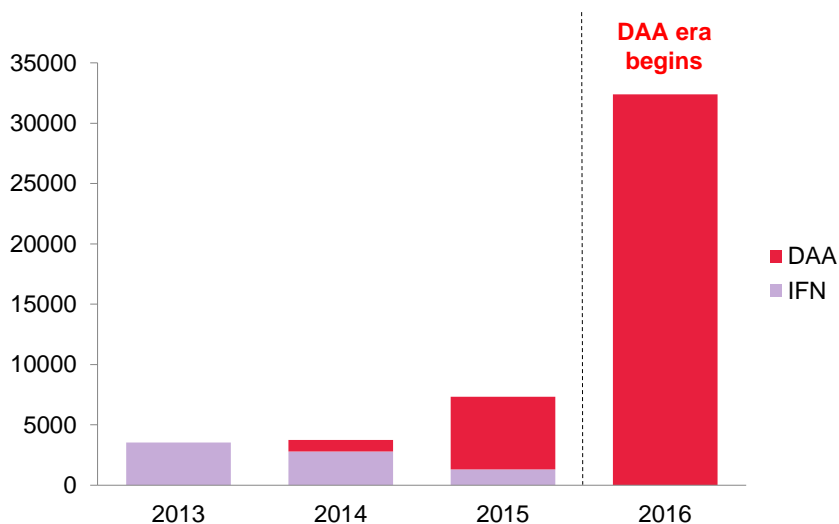
## Key features of Australian DAA Access

- It is expensive but several DAA regimens were subsidised by PBS scheme in March 2016 with no restrictions on liver disease stage
- In 2014 and 2015, patients accessed DAAs through clinical trials, pharmaceutical company compassionate access program, and generic supply
- Announcement of an investment of **\$AUD 1 billion** over the 2016-2020 period for DAA therapy in December 2015 (Australian Government)
- Co-payment: **\$AUS 7-38/month**
- Can be prescribed by GPs, with a gastroenterologist, hepatologist or infectious diseases physician
- **Retreatment (including for reinfections) allowed**

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4th National Hepatitis C Strategy

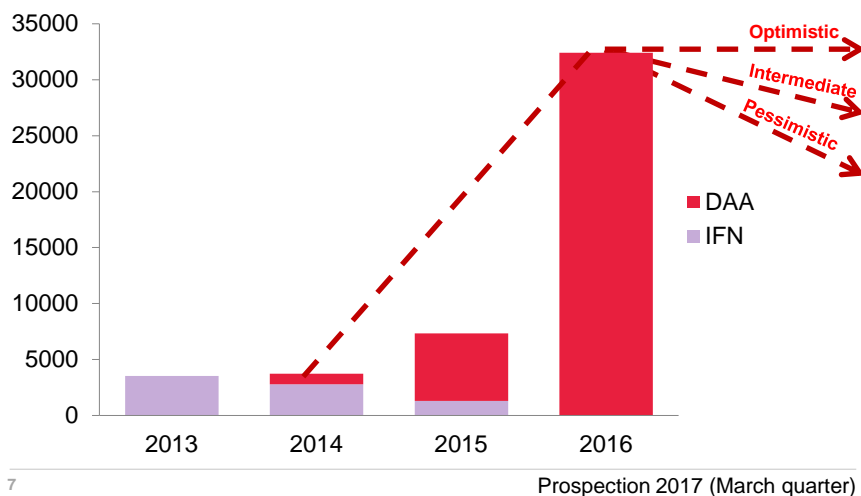
## HCV treatment in Australia



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Prospection 2017 (March quarter)

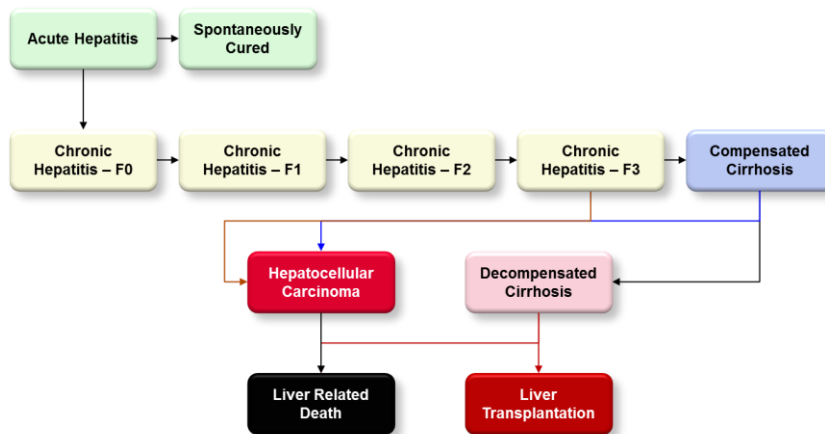
## HCV treatment in Australia: March-September 2016



## Objectives and assumptions

- **OBJECTIVE 1:** Estimating the prevalence, incidence and disease burden of HCV, nationally, by each state and territory to project future epidemic trajectories
- **OBJECTIVE 2:** To assess level of DAA roll-out required for Australia to meet the WHO HCV elimination targets by 2030
- Assumed three different future treatment coverage scenarios over 2016-2030 with 95% CI
  - Pessimistic roll-out
  - Intermediate roll-out
  - Optimistic roll-out
- Diagnosis rate was kept constant from 2016 onwards
- Reinfection is allowed but does not track separately

## HCV model disease progression



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## National treatment scenarios

- Annual number of people receiving DAA treatment nationally

Treatment roll-out	2015 (interferon + DAA)	2016	2017	2018	Post- 2019
Pessimistic	7,296	32,400	18,510	13,890	13,890
Intermediate	7,296	32,400	27,770	23,143	18,510
Optimistic	7,296	32,400	32,400	32,400	32,400

- Scenarios for each jurisdiction have same relative change in number treated over time starting from the 2016 PBS estimate
- Status quo : Pre-DAA era scenario
  - Number on treatment kept at 2015 levels
  - SVR was included for IFN and IFN-free at 2015
- DAA was prioritized for individuals with advanced stage of HCV

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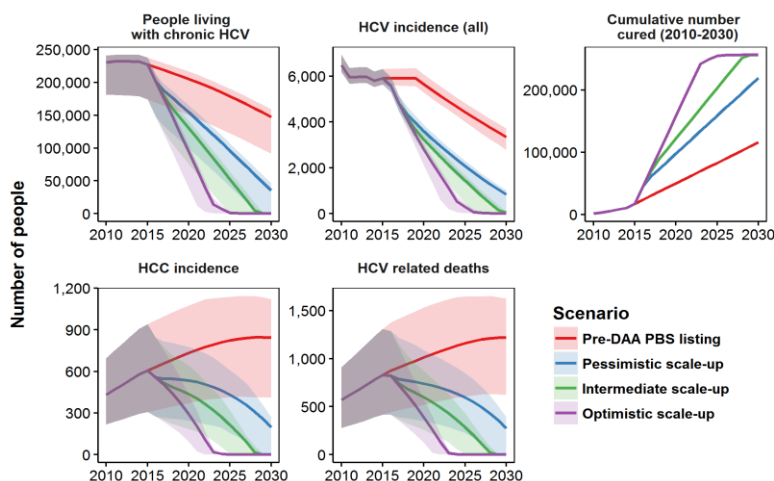
# Modelling HCV Elimination in Australia

Number living with chronic HCV and DAA coverage (best estimate)

State/Territory	Number with chronic HCV end 2015	Number of DAA initiation	% of DAA initiation	DAA coverage (%) in 2016
ACT	3,590	850	3%	24%
<b>NSW</b>	<b>80,700</b>	<b>11,400</b>	<b>35%</b>	<b>14%</b>
NT	3,610	370	1%	10%
QLD	47,360	6,500	20%	14%
SA	11,680	2,010	6%	17%
TAS	4,560	770	2%	17%
VIC	55,260	8,440	26%	15%
WA	20,550	2,280	7%	11%
<b>Australia</b>	<b>227,310</b>	<b>32,620</b>	<b>100%</b>	<b>14%</b>

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# Results – National projections



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## Results – National projections

### HCV indicators in year 2015 and 2030

	End of 2015	2030		
	Baseline	Pessimistic	Intermediate	Optimistic
People living with chronic HCV	227,310	19,940 ↓ 91%	150 ↓ 100%	60 ↓ 100%
HCV incidence	5,900	610 ↓ 90%	20 ↓ 100%	5 ↓ 100%
Chronic HCV prevalence	0.96%	0.07%	<0.01%	<0.0001%
Fibrosis (F0 - F3)	207,420	16,400	150	60
Cirrhosis (F4)	17,100	2,990	0	0
Decompensated cirrhosis	1,500	200	0	0
Hepatocellular carcinoma incidence	610	110	0	0
Annual liver related deaths	830	140	0	0

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## WHO coverage target to eliminate HCV by 2030

- Incidence of chronic HCV infections: **80% reduction**
- Treatment of HCV (coverage %): **80% of eligible treated**
- Deaths from chronic HCV infections: **65% reduction**

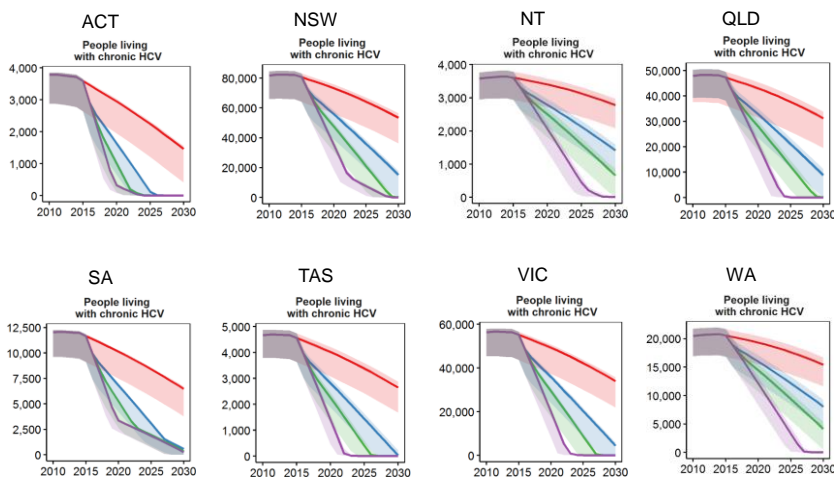
## Results – National elimination targets

Estimated year Australia meets each World Health Organization target compared to 2015 estimates

WHO target	Treatment scenario		
	Pessimistic	Intermediate	Optimistic
80% reduction in new chronic infections	2028	2026	2023
80% of people living with chronic HCV treated	2031	2026	2021
65% reduction in HCV-related deaths	2029	2024	2021

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## Results - State and territory projections



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## Results – State and territory projections

### Intermediate scenario

	People living with chronic HCV 2015	People living with chronic HCV 2030	New HCV infections 2030	HCV related deaths 2030	Year meet WHO target for infections
ACT	3,590	4	0	0	2022
NSW	80,700	120	20	0	2026
NT	3,610	570	20	3	2032
QLD	47,360	40	6	0	2027
SA	11,680	350	20	1	2025
TAS	4,560	4	0	0	2024
VIC	55,260	30	2	0	2025
WA	20,550	1,090	40	8	2030
<b>Australia</b>	<b>227,310</b>	<b>150</b>	<b>20</b>	<b>0</b>	<b>2026</b>

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## Results summary

- **During 2016 an estimated 32,400 people initiated DAA treatment giving a treatment coverage of 14% of all people living with chronic HCV**
- **Projected to eliminate HCV in 10-15 years if DAA roll out continues and is distributed optimally across the states and territories**
- **Most states/territories would meet WHO elimination target before 2030**
- **Individual state and territory will reach the WHO elimination targets in different years due to initial treatment coverage**
- **The rollout of DAAs needs to be maintained and combined with other prevention programs such as testing, NSP and OST to ensure targets are met in the shortest time**

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## Limitations

- **Model requires set of assumptions (e.g. DAA coverage uniform across risk behaviour groups)**
- **For jurisdiction internal migration not considered**
- **Diagnosis rate was kept constant from 2016 onwards**
- **Reinfection is included but the model does not track separately**
  - It goes into susceptible population again
  - could be under or overestimate
- **DAA uptake data based on pharmacy residence, not patient residence**
- **Treating 1,500 individuals per month might be too optimistic in the intermediate scenario**

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## Acknowledgements

- NSW Health, Australian government
- BRISSE HCV Estimates and Projections reference group
  - Richard Gray, Amy Kwon, Greg Dore, Jason Grebely, Rebecca Guy, Evan Cunningham, Bezhad Hajarizadeh, Andrew Lloyd, Lisa Maher, Jenny Iversen, the Kirby Institute
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- Neil Bretana

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**Thank you!**