Moving towards HCV elimination in HIV/HCV co-infection in Australia following universal access to interferon-free therapy

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Background: Epidemiology of HCV in Australia

230,000

Australians live with chronic HCV infection

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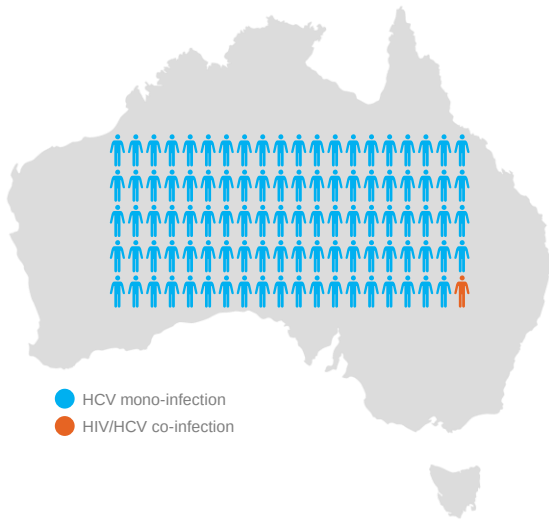
Background: Epidemiology of HCV in Australia

2,700

Australians live with HIV/HCV co-infection



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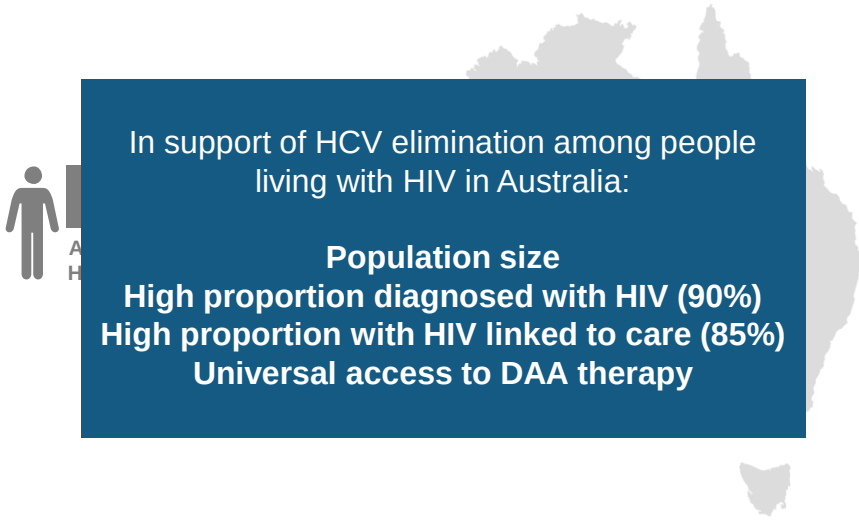
Background: Epidemiology of HCV in Australia



In support of HCV elimination among people living with HIV in Australia:

Population size
High proportion diagnosed with HIV (90%)
High proportion with HIV linked to care (85%)
Universal access to DAA therapy

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Objectives

- To evaluate:
  - HCV treatment uptake and outcomes among people with HIV/HCV co-infection following the availability of DAA therapy
  - Factors associated with DAA uptake in 2016

Methodology

Study design
- CEASE-D: Observational cohort study

Eligibility
- ≥18 years
- HIV infection
- ***Past*** (HCV Ab +ve, RNA -ve) or ***current*** (HCV Ab +ve, RNA +ve) ***HCV infection***

- Participants enrolled between 1 July 2014 and 31 Dec 2016 (n=390)

Methodology

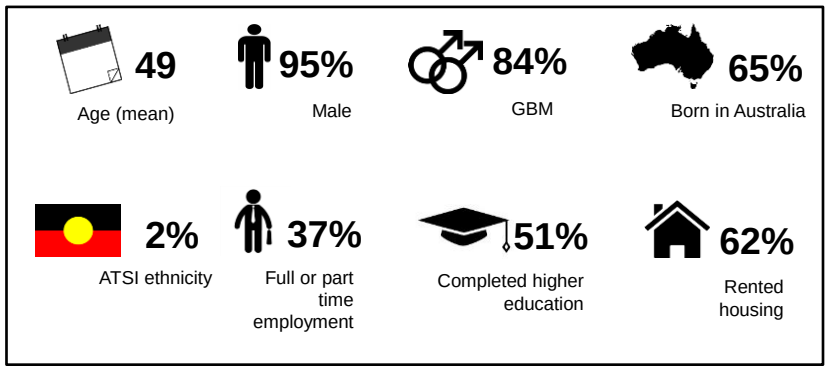
HCV treatment uptake (censored 31 Dec 2016)
Participants with spontaneous clearance excluded, n=23
- ***Cumulative:*** The proportion of individuals with chronic HCV who ever initiated treatment.
- ***Annual (2014-2016):*** The proportion of individuals with chronic HCV who initiated treatment per year.

Treatment outcome was assessed as follows:
- ***SVR12*** (HCV RNA <LLoQ at PT week 12)
- ***Virologic failure*** (HCV RNA >LLoQ at PT week 12)
  - Non-response, breakthrough or relapse
- ***Non-virologic failure*** (death, LTFU or missing HCV RNA)

Factors associated with DAA uptake in 2016
- Population: Treatment eligible participants (HCV RNA +ve)
- Logistic regression analysis.

Results: Enrolment demographics

N=390



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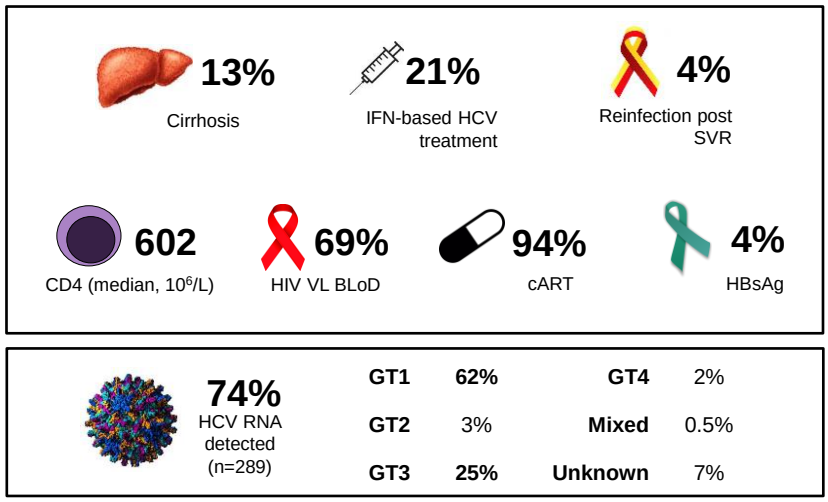
Results: Clinical and virological characteristics

N=390



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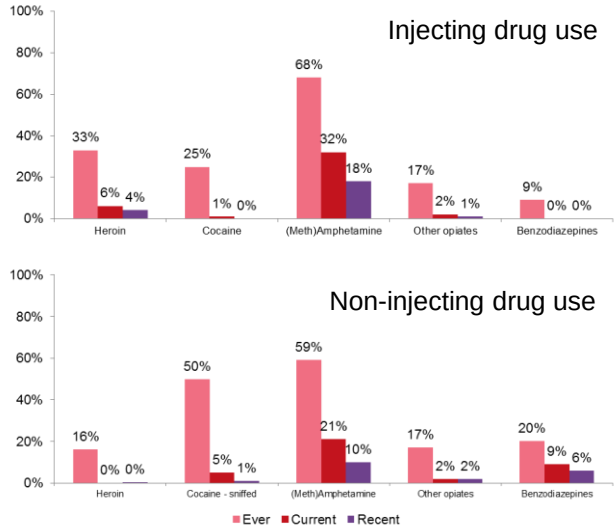
Results: Substance use

81%
IDU ever

37%
IDU current (6 months)

25%
IDU recent (1 month)



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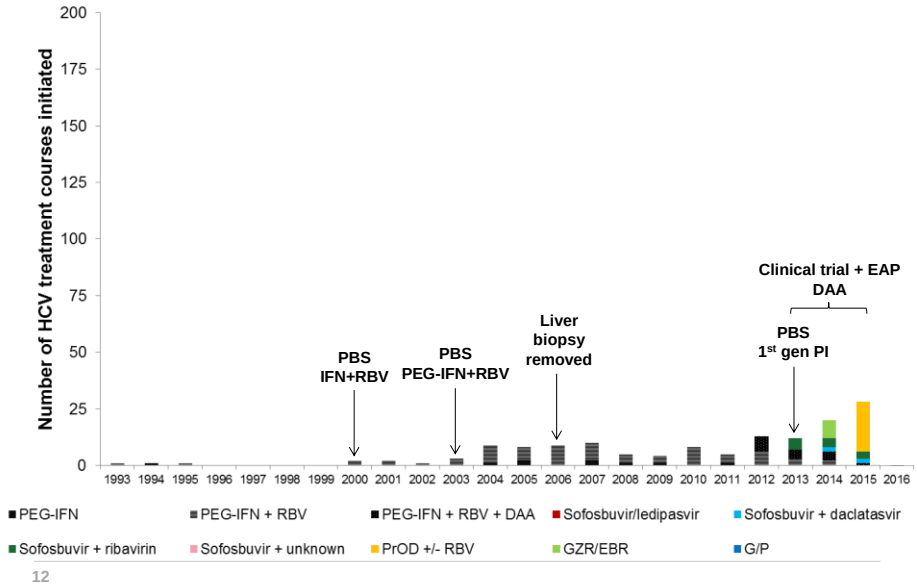
Results: Cumulative HCV treatment uptake



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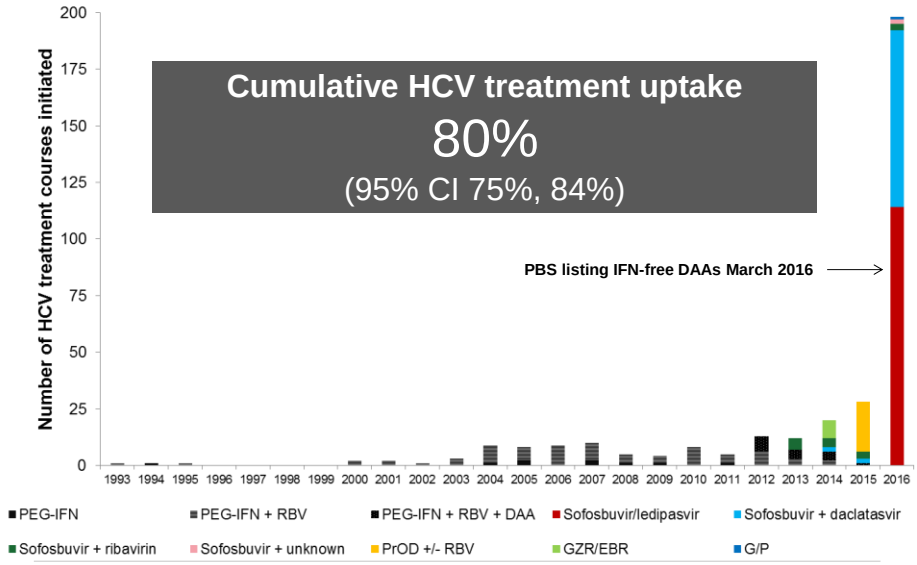
Results: Cumulative HCV treatment uptake



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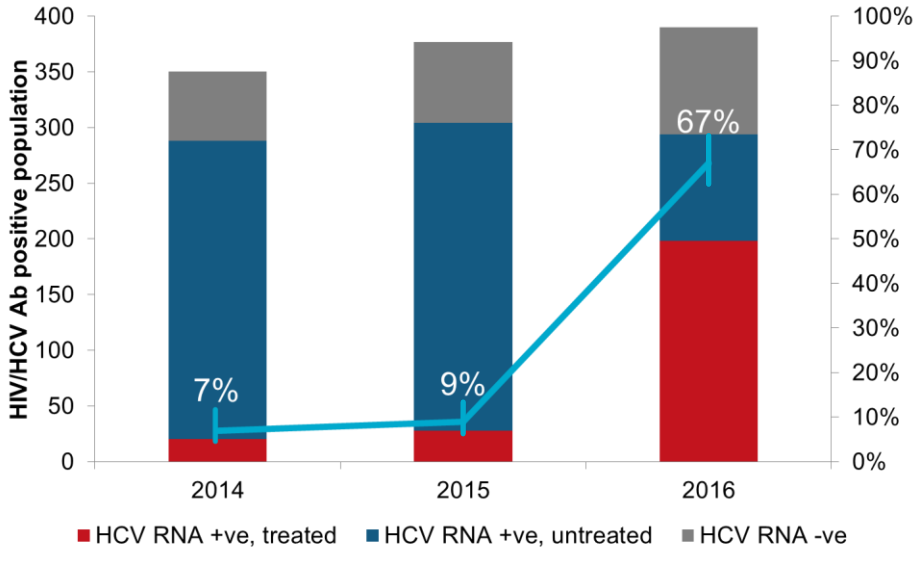
Results: Annual HCV treatment uptake



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P for trend <0.001

Results: HCV treatment outcome (2014 - 2016)

	2014	2015	2016
HIV/HCV Ab positive	350	377	390
Eligible for HCV treatment (RNA +ve)	288	304	294
Commenced HCV treatment	20	28	198
Treatment uptake (95% CI)	7% (4%, 11%)	9% (6%, 13%)	67% (62%, 73%)
HCV treatment outcome			
SVR12	**14 (70%)**	**25 (89%)**	**182 (92%)**
Virologic failure	5 (25%)	2 (7%)	4 (2%)
Non-response	2		
Relapse	3	2	4
Non-virologic failure	1 (5%)	1 (4%)	12 (6%)
Death			1
LTFU	1	1	6
Missing HCV RNA			5
Reinfection post SVR	2	1	0

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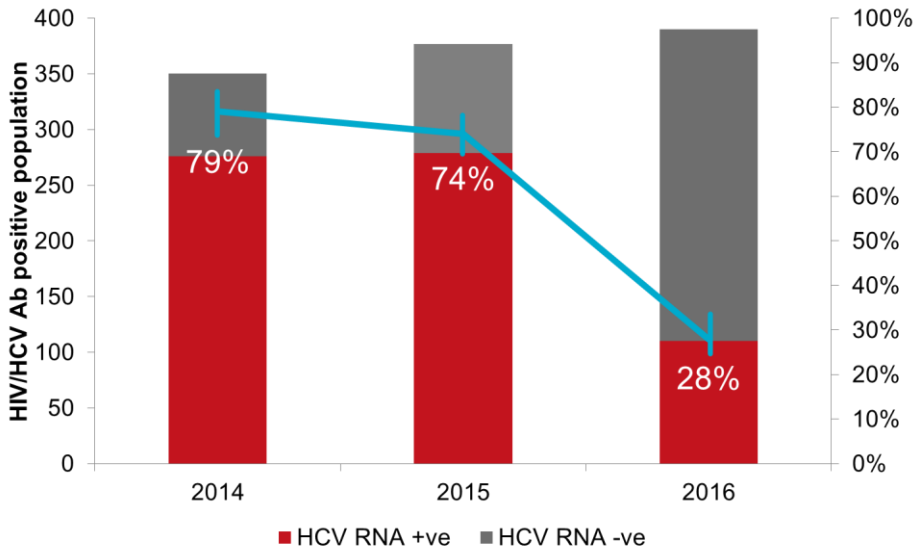
Results: HCV RNA prevalence



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*Extrapolated RNA prevalence at end of calendar year; *P* for trend <0.0001

Results: DAA uptake in 2016 – logistic regression analysis

Clinical and demographic variables	DAA treatment N=198	No DAA treatment N=96	OR (95% CI)	P	aOR (95% CI)	P
Age (per 10 years)	49 (10)	46 (10)	1.31 (1.01, 1.69)	0.040	1.28 (0.99, 1.66)	0.061
Injecting drug use – last 1 month	**46 (23)**	**34 (35)**	**0.55 (0.32, 0.94)**	**0.029**	**0.58 (0.33, 0.99)**	**0.044**

*Variables not associated with DAA uptake included gender, sexual identity, enrolment site, education level, income, housing, prior interferon-based HCV treatment, cirrhosis, IDU (ever)

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Results: DAA uptake in 2016 among GBM – logistic regression analysis

Clinical and demographic variables	DAA treatment N=164	No DAA treatment N=79	OR (95% CI)	P
Age (per 10 years)	49 (10)	47 (46)	1.33 (1.00, 1.76)	0.051
Injecting drug use – last 1 month	**39 (24)**	**30 (38)**	**0.51 (0.29, 0.91)**	**0.023**
Casual male partner/s - last 6 months	103 (63)	57 (72)	0.65 (0.33, 1.26)	0.202
Condom-less anal intercourse with casual male partner/s – last 6 months	90 (55)	52 (66)	0.63 (0.34, 1.16)	0.140
Group sex – last 6 months	52 (32)	32 (41)	0.68 (0.39, 1.19)	0.178

*Variables not associated with DAA uptake included enrolment site, education level, income, housing, prior interferon-based HCV treatment, cirrhosis, IDU (ever)

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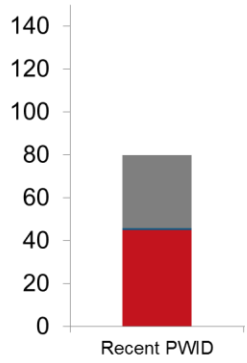
Results: DAA uptake and outcomes in “high risk” sub-populations in 2016



	PWID
DAA uptake	58%
SVR12	98%

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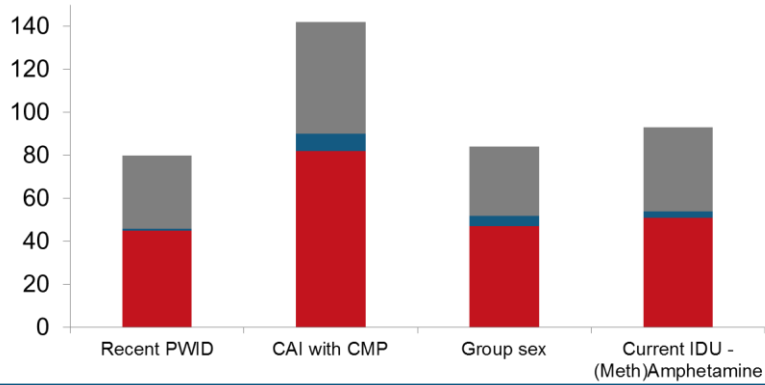
Results: DAA uptake and outcomes in “high risk” sub-populations in 2016



	PWID	GBM		
DAA uptake	58%	63%	62%	58%
SVR12	98%	91%	90%	94%

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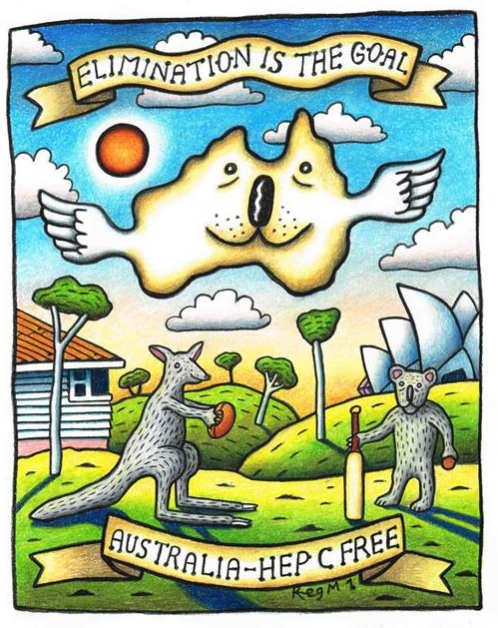
Conclusion

- Broad government-subsidised access to DAA therapy has permitted rapid HCV treatment scale-up, with substantial uptake among people living with HIV/HCV co-infection

- A high rate of HIV/HCV diagnosis, universal access to DAA therapy and high treatment efficacy should establish a foundation for achieving WHO HCV elimination targets in this population.
  - **Need to ensure equitable access to HCV treatment**

- Ongoing HCV elimination strategies will require:
  - Monitoring of DAA treatment uptake and outcomes
  - Monitoring of HCV RNA prevalence and incidence (primary and **reinfection**)
  - Screening for and treatment of HCV reinfection
  - Access to harm reduction services and education



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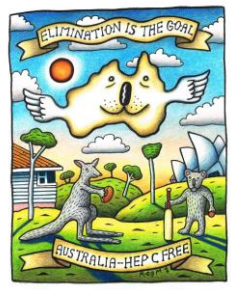
- Participants and their families



WHO Global Hepatitis Report, 2017

UN/WHO, May 2016:

Elimination of viral hepatitis as a public health threat by 2030.

- Reduction HCV incidence: 80%
- Reduction in HCV-related mortality: 65%

Global Hepatitis Report 2017. Geneva: World Health Organization; 2017.

Background: Elimination vs eradication

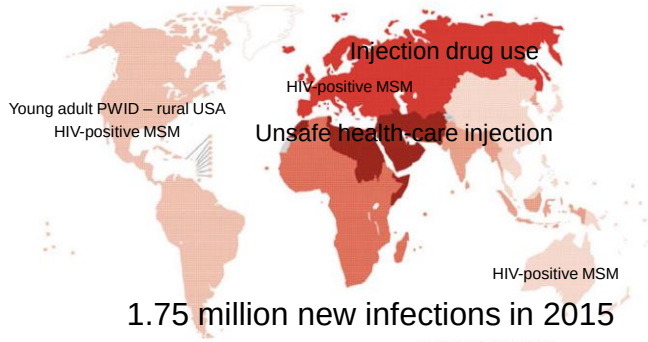
Elimination: Reduction in infection incidence to zero in a defined geographical area as a result of deliberate efforts; continued measures to prevent transmission required

Examples: measles, poliomyelitis

Eradication: Permanent reduction of worldwide infection incidence to zero as a result of deliberate efforts; intervention measures are no longer needed

Example: smallpox

Incidence of HCV (general population), 2015



1.75 million new infections in 2015

Incidence of HCV infection

WHO region	Map key	Incidence rate (per 100 000) Best estimate	Incidence rate (per 100 000) Uncertainty interval	Total number (000) Best estimate	Total number (000) Uncertainty interval
African Region		31.0	22.5–54.4	309	222–544
Region of the Americas		6.4	5.9–7.0	63	59–69
Eastern Mediterranean Region		62.5	55.6–65.2	409	363–426
European Region		61.8	50.3–66.0	565	460–603
South-East Asia Region		14.8	12.5–26.9	287	243–524
Western Pacific Region		6.0	5.6–6.6	111	104–124
Global		**23.7**	**21.3–28.7**	**1 751**	**1 572–2 120**

Global Hepatitis Report 2017. Geneva: World Health Organization; 2017.

Country-specific HCV elimination programs

Country	Treatment scale-up commencement year	Estimated HCV epidemic measure in: 2014 HCV-infected population	2014 Proportion diagnosed with HCV	2014 Treatment uptake (per year)	2016 Treatment uptake (per year)
Australia	2016	230 000	75%	1-2%	14%
Egypt	2014	6 080 000	21%	<1%	
Georgia	2015	250 000	6%	<1%	4-10%
France	2016	196 000	70%	5%	
Iceland	2016	1 000	82%	3%	41-51%
Mongolia	2016	150 000	30%	<1%	5%
Portugal	2015	100 000	35%	<1%	

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Background: PBS listing of HCV DAAs March 2016

- DAA therapy for all Australians ≥18 years with chronic HCV
- No liver disease stage, or drug and alcohol restrictions
- Broad practitioner base (including GPs) with public hospital (S100) and community pharmacy (S85) dispensing

Date listed	Generic name	Genotype	Duration (weeks)
March 2016	Sofosbuvir/Ledipasvir	1	8-24
	Sofosbuvir + Daclatasvir	1, 3	12-24
	Sofosbuvir + Ribavirin	2	12
	Sofosbuvir + Peg-IFN + Ribavirin	1, 3, 4-6	12
May 2016	Paritaprevir/Ritonavir/Ombitasvir + Dasabuvir +/- Ribavirin	1	12-24
Jan 2017	Grazoprevir/elbasvir	1, 4	12-16
August 2017	Sofosbuvir/velpatasvir	1-6	12

Results: Sexual behaviour in GBM

	GBM N=326
Regular male partner	112 (34%)
HIV Ab positive	68 (61%)
HCV Ab positive	16 (14%)
Casual male partner/s in last 6 months	207 (63%)
Condom-less anal intercourse with CMP in last 6 months	177 (54%)
Group sex last 6 months	103 (32%)
Disclose HIV status with casual male partner/s – "never"	27 (13%)
Disclose HCV status with casual male partner/s – "never"	94 (45%)

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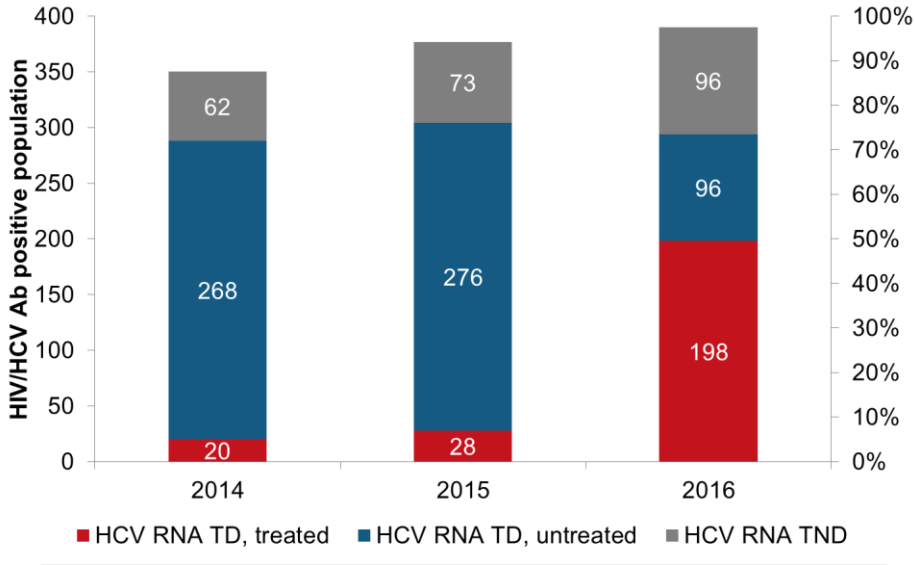
Results: Annual HCV treatment uptake



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