Ongoing burden of advanced liver disease complications despite rapid HCV treatment scale-up

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2. NSW Ministry of Health, Australia
3. Centre for Disease Analysis, Louisville, CO, USA

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Overview

- In 2015, 227,300 people were living with chronic HCV
- Estimated 32,600 individuals initiated direct acting antiviral (DAA) in 2016 in Australia followed by 21,370 in 2017
- Aim to determine if Australia can meet the WHO mortality target by 2030 (65% reduction in liver-related deaths)
- Also explore reduction in liver-related deaths among both viraemic and cured populations

Liver-related mortality

- People with F3/F4 can progress to HCC/DC, even following cure
- The WHO mortality target (65% reduction) should include evaluation in cured and viraemic population
- Previous model focused on the viraemic population, but has been updated to include cured population
- OBJECTIVE 1: Estimating numbers of cases of DC, HCC, liver-related deaths among the HCV cured and viraemic populations in Australia
- OBJECTIVE 2: To determine when Australia will meet the WHO HCV mortality elimination target under different DAA treatment scenarios

3

National treatment modelling scenarios

- Annual number of people receiving DAA treatment nationally

Treatment roll-out	2015 (interferon + DAA)	2016	2017	2018	Post- 2019
Pessimistic	7,296	32,600	21,370	12,822 40%↓	7,693 40%↓
Intermediate	7,296	32,600	21,370	17,096 20%↓	13,677 20%↓
Optimistic	7,296	32,600	21,370	21,370	21,370

- Ran scenarios over 2016-2030 with 95% CI

4

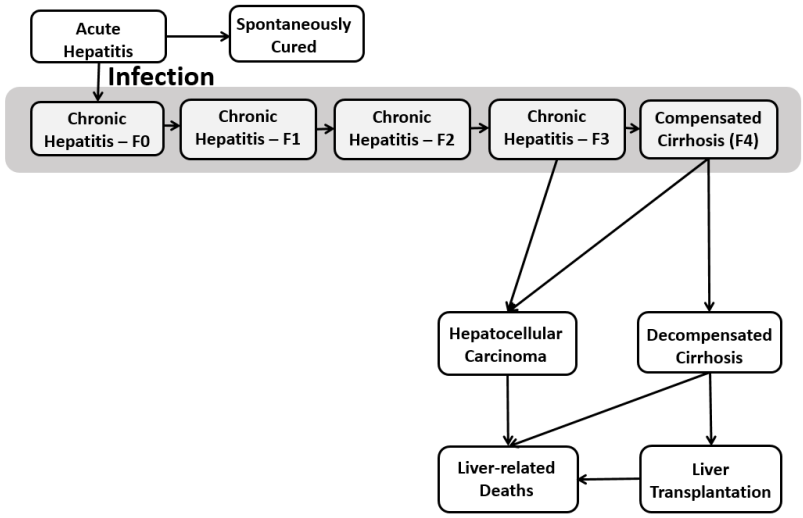
Assumptions and model inputs affecting HCV mortality

- **In 2016-2017 DAA uptake higher in advanced fibrosis (REACH-C study); ongoing DAA treatment incorporated continued higher uptake.**
- **SVR (REACH-C study)**
  - **F0 - F3: 95%**
  - **F4: 90%**
- **Diagnosis rate was kept constant from 2016 onwards**
- **Disease progression among cured (compared to viraemic)**
  - 76% reduction to DC
  - 77% reduction to HCC
- **50% reduction in mortality among those with DC/HCC**
  - HBV linkage study showed 2-3 fold increase in DC and HCC survival following viral control of HBV[1]

5

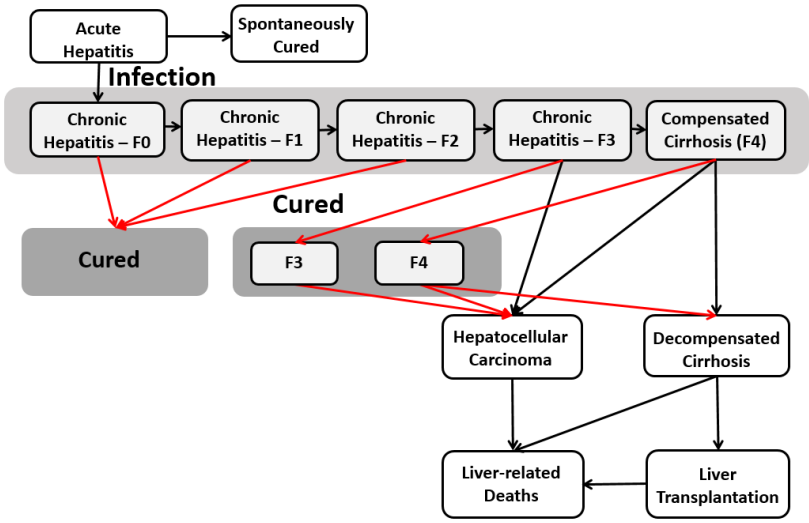
1. Waziry R. et al. Hepatol Commun. 2017; 1(8):736-747

HCV model disease progression



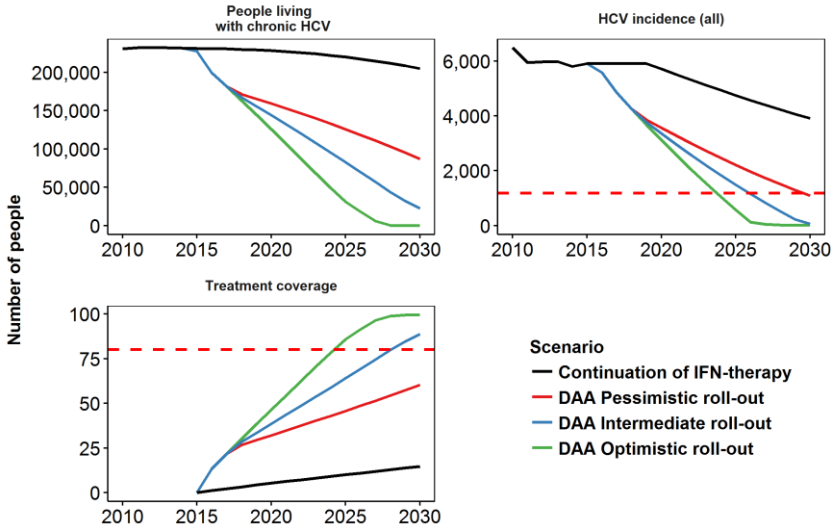
6

HCV model disease progression



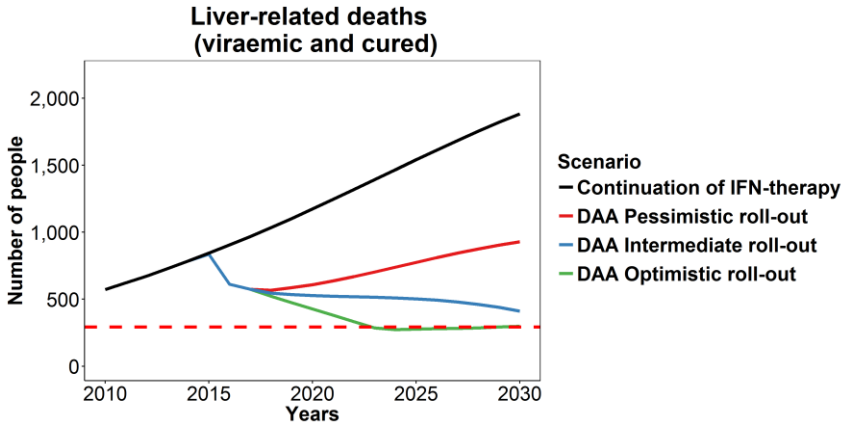
7

Results – PLHCV, incidence and coverage



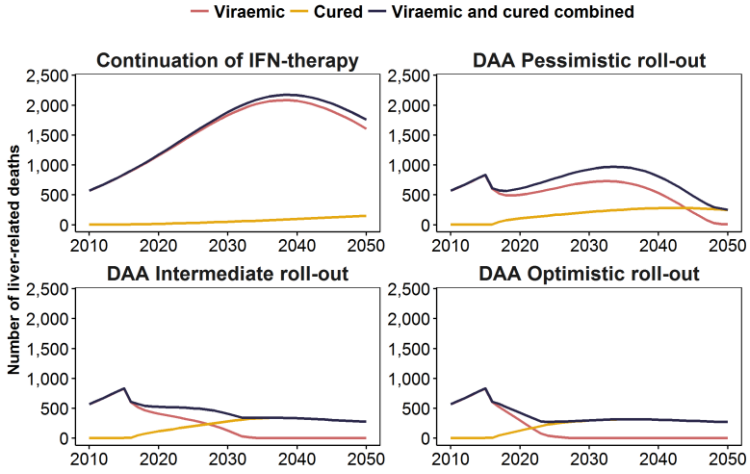
8

Results – Liver related deaths among cured and viraemic



9

Results - Liver-related deaths among cured and viraemic



10

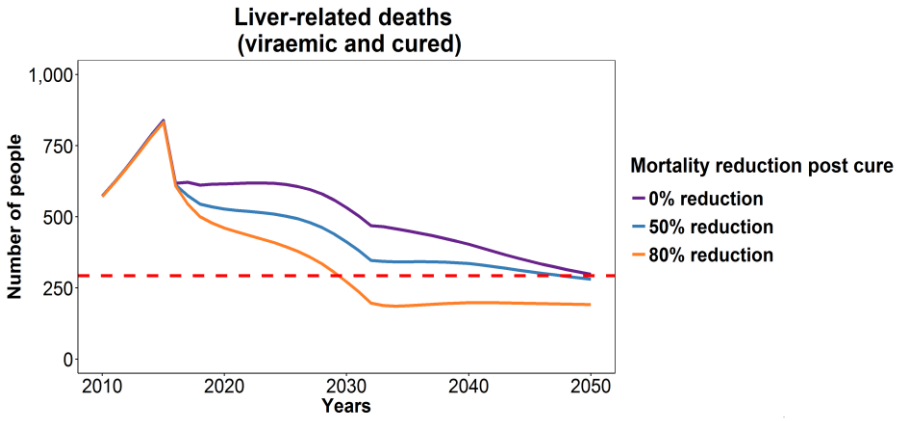
Results – Uncertainty analysis

Estimated year Australia meets WHO mortality target (65% reduction)

Relative reduction in liver-related mortality following cure	Treatment scenario		
	Pessimistic	Intermediate	Optimistic
0% reduction	>2050	>2050	2048
50% reduction	2048	2047	2023
80% reduction	2047	2030	2021

11

Results – Uncertainty analysis for Intermediate scenario



12

Results summary

- **High DAA uptake and cure rates among people with F3/4 means many cases of DC, HCC and liver-related mortality will still occur among those cured, despite reduced individual risk**
- **Overall DAA uptake needs to be between intermediate (13,677/year) and optimistic (21,370/year) to achieve 65% mortality reduction**
- **More rapid mortality reduction could be achieved through reductions in liver co-morbidity (e.g. heavy alcohol use), earlier detection/improved survival of HCC, enhanced access to liver transplantation**
- **Relative reduction in deaths very sensitive to mortality reduction in people cured with HCC/DC**
  - Data linkage outputs will be used to validate our parameters and assumptions

13

Limitations

- **DAA coverage uniform across risk behaviour groups**
- **Diagnosis rate was kept constant from 2016 onwards**
- **Regression of fibrosis stages among cured population was not considered**
- **Have not evaluated impact of changes in co-morbidities such as alcohol**

14

Acknowledgements

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