

# Optimizing point-of-care testing strategies for diagnosis and treatment of hepatitis C virus infection in Australia: A model-based cost-effectiveness analysis

## Authors:

Shih STF<sup>1</sup>, Cheng Q<sup>1</sup>, Carson J<sup>1</sup>, Valerio H<sup>1</sup>, Sheehan Y<sup>1</sup>, Gray RT<sup>1</sup>, Cunningham EB<sup>1</sup>, Kwon JA<sup>1</sup>, Lloyd AR<sup>1</sup>, Dore GJ<sup>1</sup>, Wiseman V<sup>1</sup>, Grebely J<sup>1</sup>

<sup>1</sup>The Kirby Institute, UNSW Sydney, Sydney, Australia

**Background:** Timely diagnosis and treatment of hepatitis C virus (HCV) is critical to achieve elimination goals. Understanding the HCV prevalence and settings where different point-of-care testing strategies should be used is critical to inform implementation and policymaking. This study evaluated the cost-effectiveness of point-of-care testing strategies for HCV compared to laboratory-based testing in standard of care.

**Methods:** Cost-effectiveness analyses were undertaken from the perspective of Australian Governments as funders by modelling point-of-care testing strategies compared to standard of care in needle and syringe programs, drug treatment clinics, and prisons. Point-of-care testing strategies included immediate point-of-care HCV RNA testing and combined point-of-care HCV antibody and reflex RNA testing for HCV antibody positive people (with and without consideration of previous treatment). Sensitivity analyses were performed to investigate the cost per treatment initiation with different testing strategies at different HCV antibody prevalence levels and the treatment uptake required for point-of-care testing to be cost-effective.

**Results:** The average costs per HCV treatment initiation by point-of-care testing were up to 35% lower (A\$890–A\$1,406) compared to standard of care (A\$1,248–A\$1,632) depending on settings. The average costs of point-of-care testing were A\$1,080–A\$1,406 for RNA, A\$960–A\$1,310 for combined antibody/RNA without treatment history consideration, and A\$890–A\$1,189 for combined antibody/RNA with treatment history consideration. When HCV antibody prevalence was <74%, combined point-of-care HCV antibody and point-of-care RNA testing (with and without consideration of treatment history) were the most cost-effective strategies. Modest increases in treatment uptake by 8%–31% were required for immediate point-of-care HCV RNA testing to achieve equivalent cost per treatment initiation compared to standard of care.

**Conclusion:** Point-of-care testing is more cost-effective than standard of care for populations at risk of HCV. Testing strategies combining point-of-care HCV antibody and RNA testing are likely to be cost-effective in most settings.

**Disclosure of Interest Statement:** This work was supported by the Point of Care Research Consortium for Infectious Disease in the Asia Pacific (RAPID) which is funded through a National Health and Medical Research Council Centre for Research Excellence Grant [grant number 1153647]. The funding body has no role in the writing of the manuscript or the decision to submit the manuscript for publication. The Kirby Institute is funded by the Australian Government Department of Health and Ageing.

RTG has received funding for his research from WHO and has provided non-funded project advice to Gilead and ViiV. YS is a co-investigator on investigator-initiated research grants from AbbVie and Gilead Sciences. ARL has received investigator-initiated research grants from AbbVie, Gilead Sciences, and Sequiris. GJD is a consultant/advisor and has received research grants from Abbvie, Abbot Diagnostics, Gilead Sciences, Bristol Myers Squibb, Cepheid, GlaxoSmithKline, Merck, Janssen and Roche. JG is a consultant/advisor and has received research grants from AbbVie, Biolytical, Camurus, Cepheid, Gilead Sciences, Hologic, Indivor, and Merck/MSD and has received honoraria from AbbVie, Cepheid, Gilead Sciences, and Merck. No input into this work was provided by any of the above listed organizations or institutions.

All other authors have no conflicts of interest to declare.