



Australia's
Global
University

We have reached single-visit diagnosis and treatment for hepatitis C infection: what next?

Professor Jason Grebely

Lisbon Addictions Conference 2022, 23rd November 2022



Acknowledgements



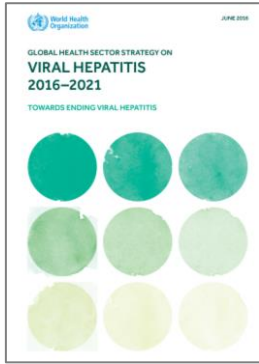
Queensland Health



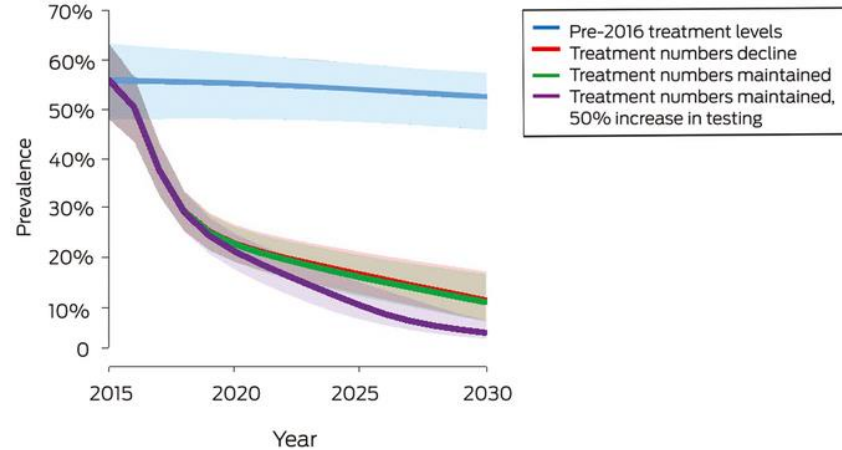
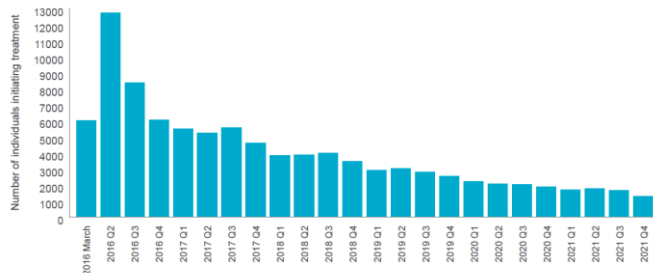
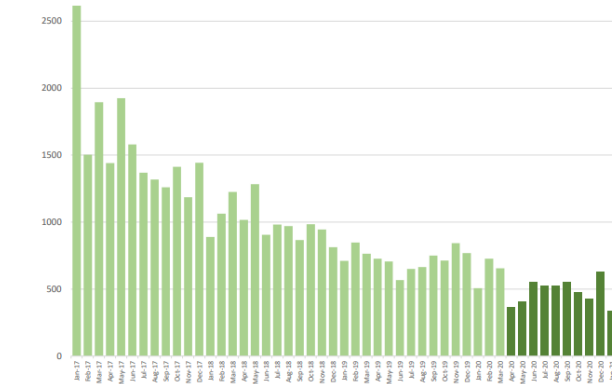
Disclosures

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HCV elimination requires increased testing and treatment

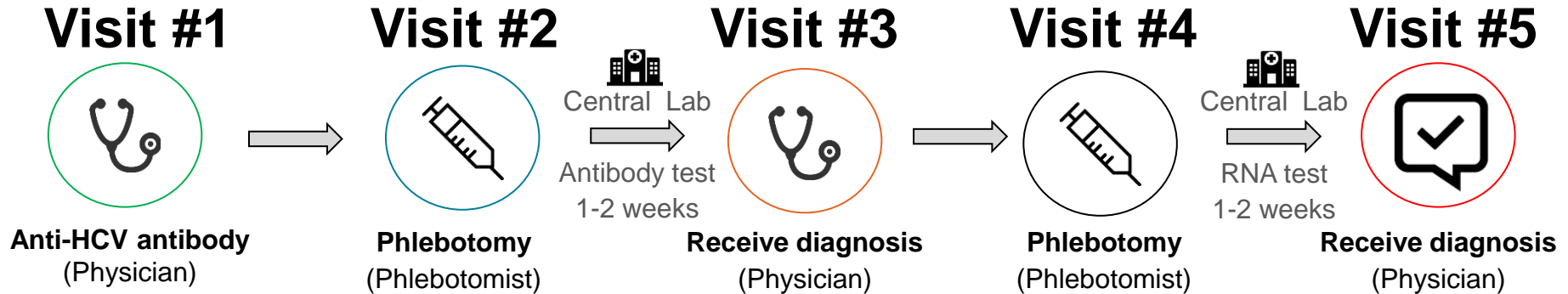


Eliminate viral hepatitis as a major **public health threat** by 2030

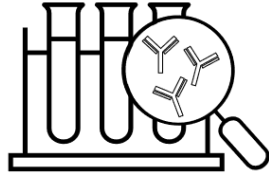
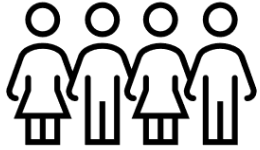


1) Doherty Institute. National Viral Hepatitis Mapping Project (extracted March 2021), 2021; 2) The Kirby Institute, Monitoring hepatitis C treatment uptake in Australia (Issue 11, July 2021), 2021; 3) Scott N, et al Medical Journal of Australia 2020.

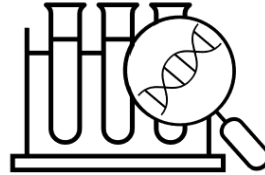
The long journey to an HCV diagnosis....



Interventions to enhance the care cascade



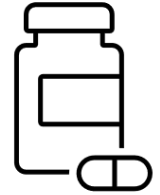
Antibody testing



RNA testing



Linkage to care



Treatment initiation

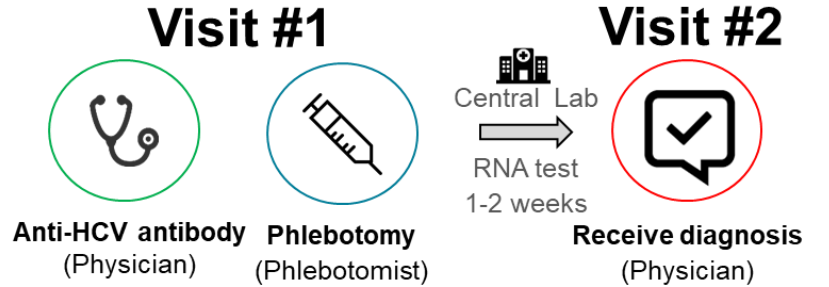
Simplification of testing

- Point-of-care antibody testing
- Dried blood spot testing
- Reflex RNA testing
- Opt-out screening (w/ consent)

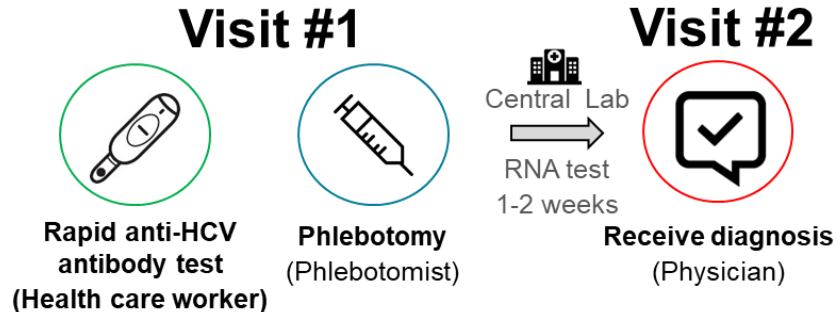
Towards simplification – Implement on-site testing



The integration of on-site testing with other innovations



Reflex RNA testing



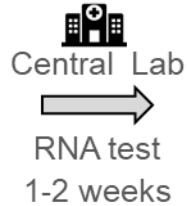
Rapid HCV antibody testing

On-site testing and removal of venepuncture

Visit #1



**Dried blood
spot sample**
(Health care worker)



Visit #2

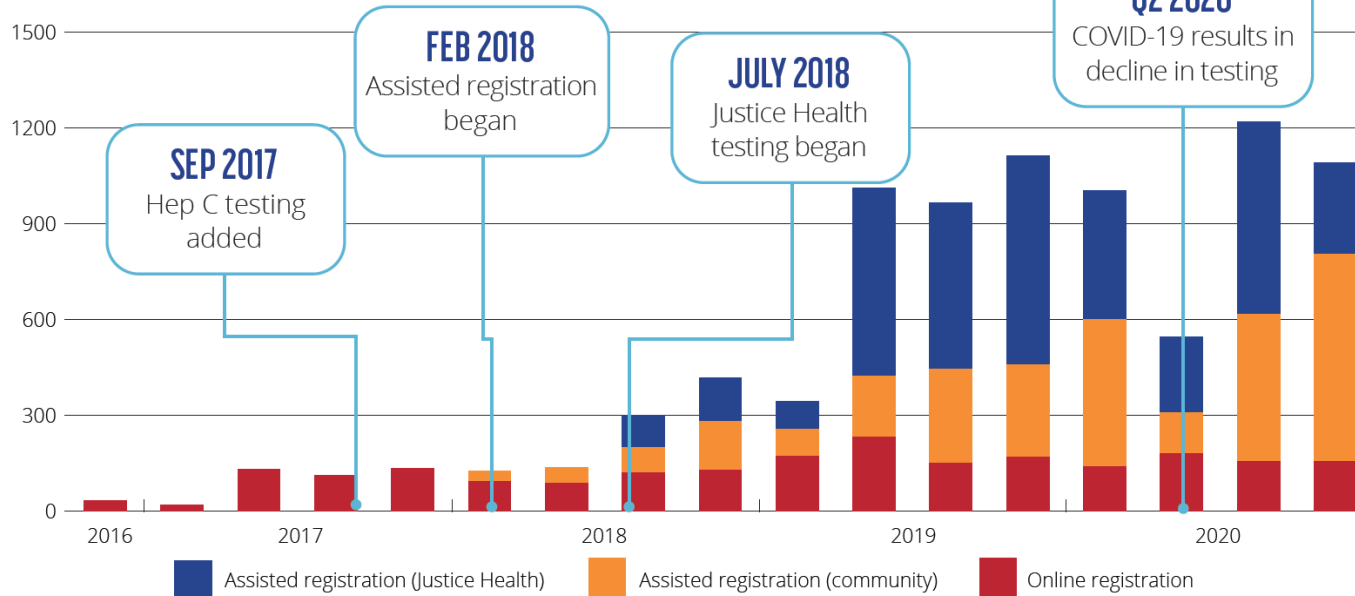


Receive diagnosis
(Physician)

Dried blood spot testing

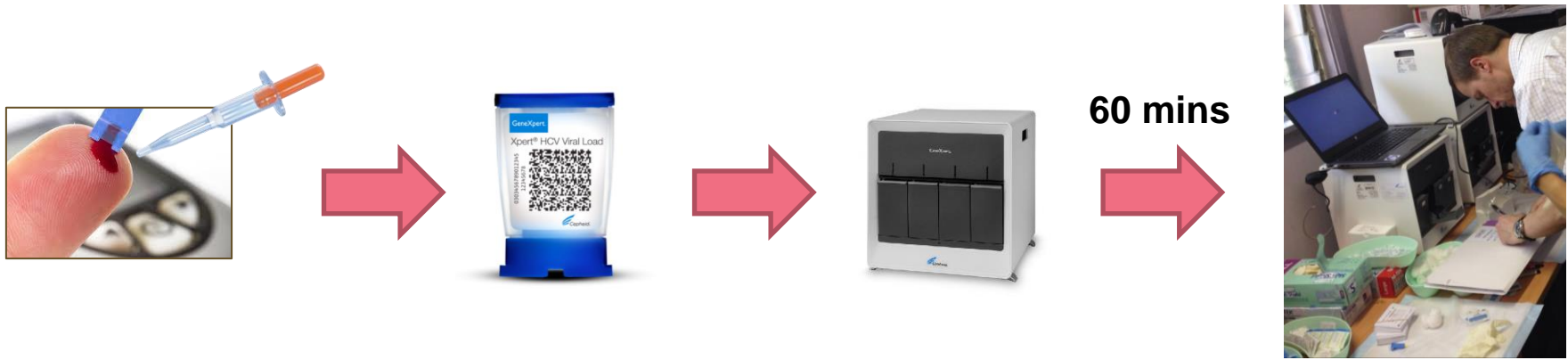
NSW Health DBS Pilot Project

TESTING OVER TIME



- 7,392 people tested between 2016-2020
- HCV prevalence was 15% (Online: 5%, Community: 17%, Prison: 14%)
- Treatment uptake was 45% (Online: 13%, Community: 26%, Prison 63%)

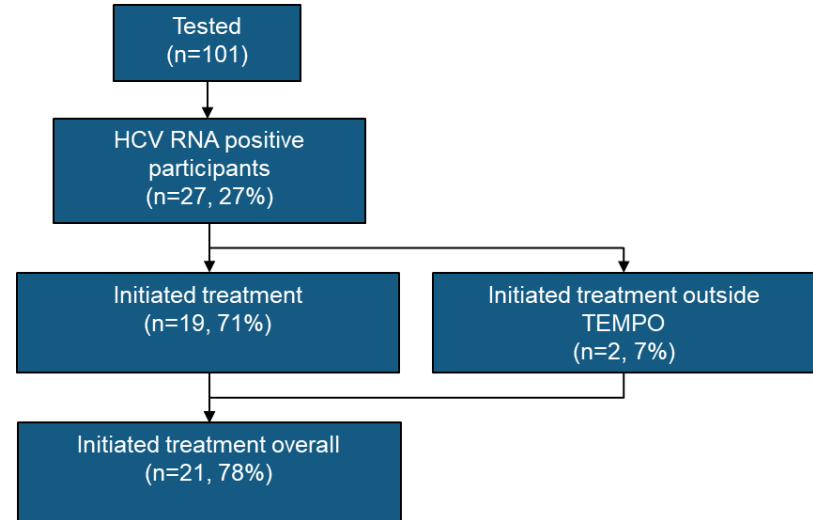
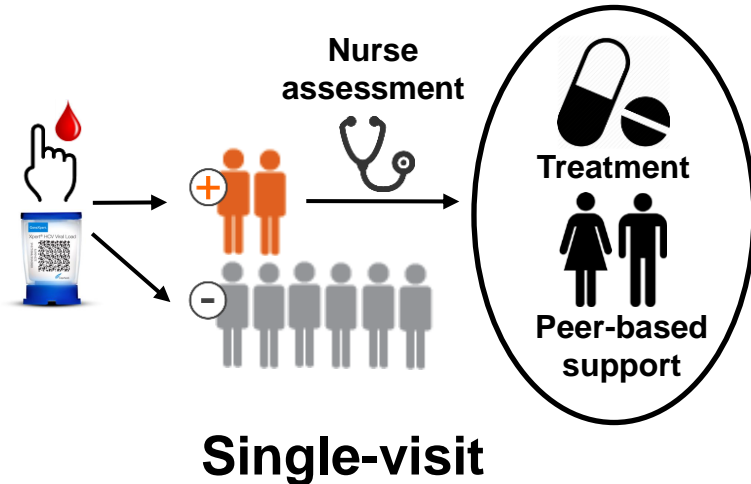
Finger-stick testing for HCV RNA detection



- TGA approval of Xpert[®] HCV Viral Load Fingerstick for detection of active HCV infection in one hour at the point-of-care is a ‘game-changer’
- Enables diagnosis and treatment in a single-visit, increases testing acceptability and reduces loss to follow-up
- Opportunity to address the drop-off in the HCV care cascade
- Good technical accuracy (100% sensitivity/specificity)¹⁻²

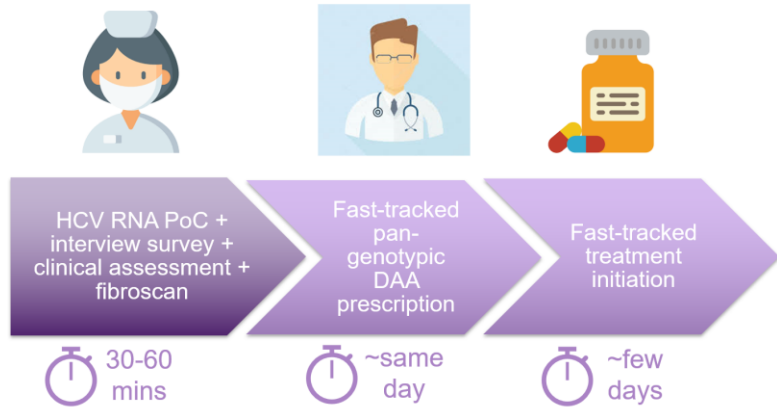
Point-of-care HCV RNA testing in NSPs – TEMPO Pilot

- Participants recruited from a community-led NSP in Sydney (n=101, Sept 2019-Apr 2021)
- Fibroscan-based disease assessment and point-of-care testing for HIV (Alere HIV Combo) and HBV (Alere Determine II HBsAg) for people with current HCV
- 100% injecting in the previous month, 18% \geq daily injecting
- 53% initiated HCV treatment in the same visit



Point-of-care HCV RNA testing in prisons – PIVOT

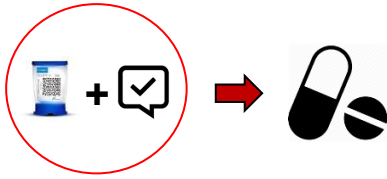
- Participants recruited from a reception prison on the Mid North Coast of NSW
- Control (Oct 2019-May 2020, n=240) and intervention phase (June 2020-Apr 2021, n=301)



Control: standard of care			'One-stop-shop' intervention	
Event	Number (%)		Event	Number (%)
Enrolled	240	90 days $p < 0.001$	Enrolled	301
Ever injected (at risk)	116/240 (48%)		Ever injected (at risk)	125/301 (42%)
HCV Ab / RNA testing	43/240 (18%)		HCV RNA PoC testing	298/301 (99%)
HCV RNA positive	19/43 (44%)		HCV RNA positive	30/298 (10%)
DAA treatment initiated	5/19 (26%)		DAA treatment initiated	28/30 (93%)
		$p < 0.001$		6 days

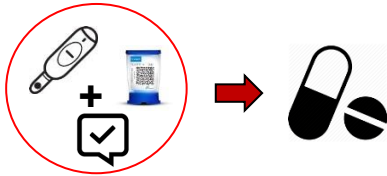
Single-visit strategies to improve testing

Single visit



Point-of-care HCV RNA and
diagnosis (Health care worker)

Point-of-care HCV RNA
(high HCV prevalence setting)



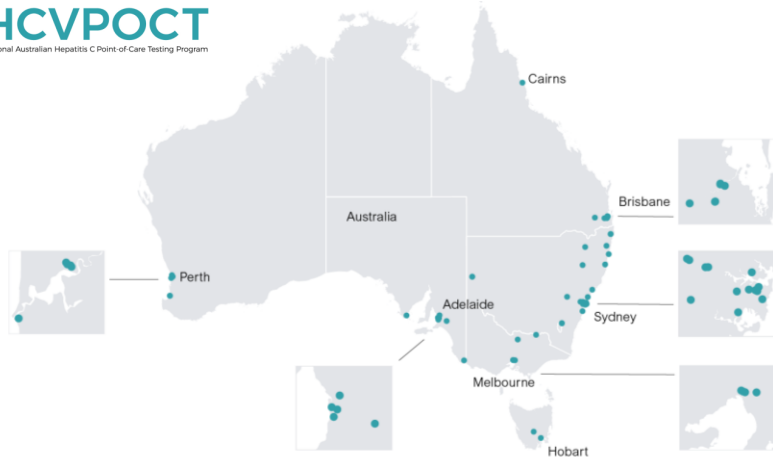
Rapid anti-HCV antibody test,
point-of-care HCV RNA and
diagnosis (Health care worker)

Rapid HCV antibody testing with
reflex point-of-care HCV RNA
(low HCV prevalence setting)

Why might point-of-care antibody testing be optimal?

- Point-of-care HCV RNA testing is more expensive than antibody testing
 - \$60 vs. \$10 per test
- Point-of-care HCV RNA testing has a longer time to result (60 mins) compared to:
 - Negative HCV antibody testing (20 minutes)
 - Positive HCV antibody testing (5 minutes)
- Might improve efficiency with the use of the GeneXpert platform
 - Limit of 4 tests per hour (one per module for a 4-module machine)
 - Could use HCV antibody testing to triage patient samples for testing blitzes

National program to scale-up HCV point-of-care testing



- 85 sites nationally with 50-60,000 people tested (2021-24)
- Drug treatment clinics, NSPs, prisons, mental health, mobile outreach models, homelessness services, Aboriginal Community Controlled Health Organisations
- Testing for anyone at risk of HCV or attending service
- Program includes:
 - 1) SOPs, logistics, deployment, and set-up
 - 2) Training
 - 3) Quality assurance program
 - 4) IT/connectivity
 - 5) Research and evaluation framework

National Australian Hepatitis C Point-of-Care Testing Program

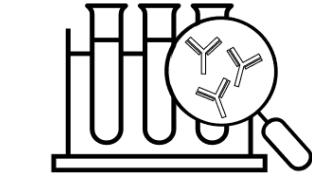
Program Duration	3 years
# Services	85 (200-300 testing sites/locations)
Specimens	Capillary finger-stick
Analytes	HCV antibody, HCV RNA, HIV Ab/Ag, HBsAg
POC Device; Time to result	HCV Bioline, 20 min (5 min pos); GeneXpert, 60 min
Partners	Flinders University, Commonwealth Govt, State/Territory Govts, National and state community organisations



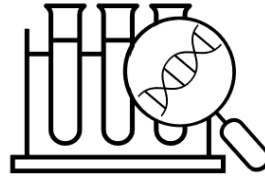
Program update

- 35 sites are active (ACT, QLD, NSW, SA, TAS)
- 100 operators have received training for point-of-care HCV testing
- 5,283 people have received point-of-care HCV testing (RNA: n=4,628; antibody: n=946):
 - 1,915 have received testing in the community (11% prevalence)
 - 3,368 people have received testing in prison (14% prevalence)
- 669 people with current HCV infection
- Testing blitzes at eight prisons (Queensland, n=5; New South Wales, n=1; and South Australia, n=2)

Interventions to enhance the care cascade



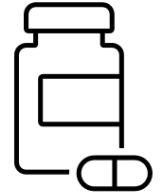
Antibody testing



RNA testing



Linkage to care



Treatment initiation

Simplification of testing

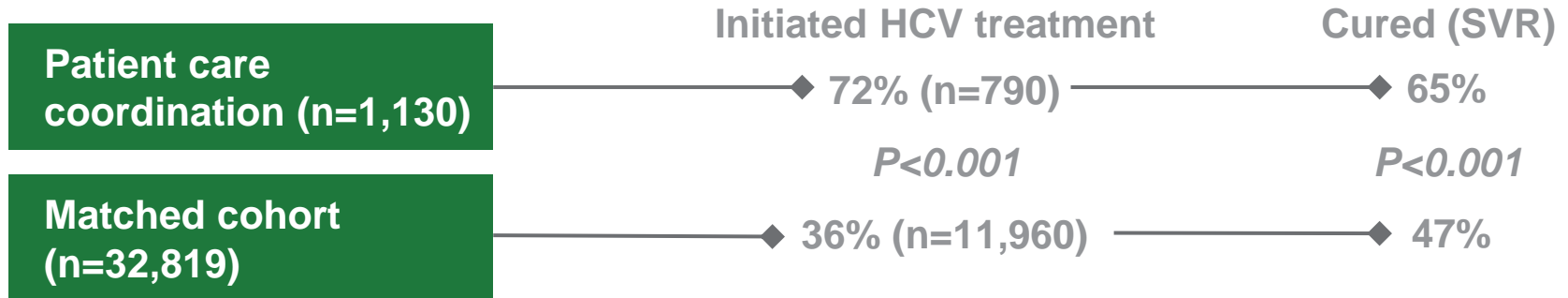
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Patient engagement in care

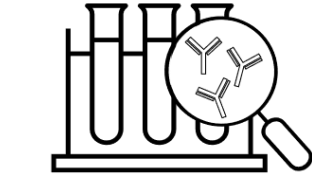
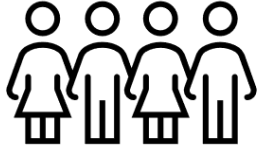
- Patient reminders for testing
- Patient navigation/coordination
- Patient education

Patient care coordination

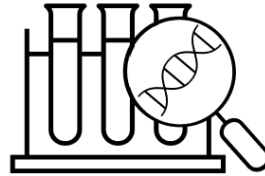
- HCV care coordination programme (INSPIRE) in New York City
- Care coordination: participants assigned a care coordinator who provided support navigating the health care system, accompaniment to medical appointments, medication adherence counselling, health promotion modules, and self-sufficiency coaching
- Patient care coordination (n=1,130) vs. matched cohort of HCV-infected persons in NYC Surveillance registry (n=32,819)



Interventions to enhance the care cascade



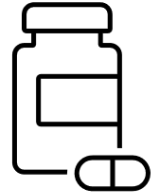
Antibody testing



RNA testing



Linkage to care



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Patient engagement in care

- Patient reminders for testing
- Patient navigation/coordination
- Patient education

Provider engagement in care

- Provider care coordination
- Medical chart reminders
- Provider education

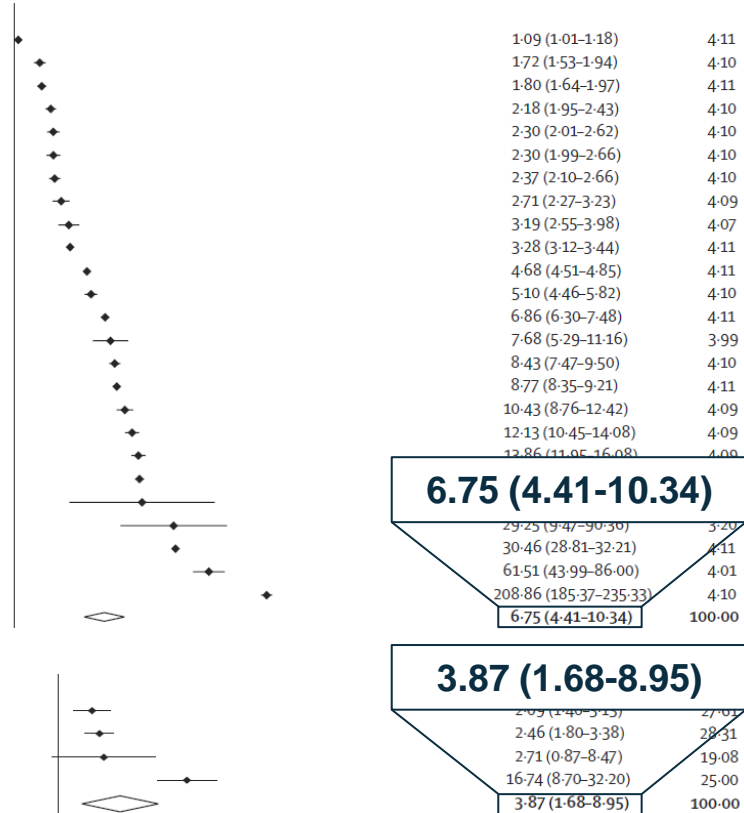
Medical chart reminders

Medical chart reminders

Al-Hihi et al (2017) ³⁵	1800/5533	1667/5444
Litwin et al (2012; study 2) ³⁶	1006/10165	395/6591
Fitch et al (2017) ³⁷	1700/5578	854/4355
Golden et al (2017) ³⁸	1185/3336	681/3373
Nitsche et al (2018) ³⁷	399/3849	561/11698
Tzarnas et al (2015) ³⁹	646/3432	299/3267
Litwin et al (2012; study 1) ³⁶	1177/8981	395/6591
Magaldi et al (2018) ⁴⁰	1543/1837	721/1093
Mehta et al (2020; study 1) ⁴¹	357/829	156/813
White et al (2018) ⁴²	6972/19887	2968/20975
Jain et al (2019) ⁴³	11780/34093	4946/48755
Drainoni et al (2012) ⁴⁴	822/3250	357/5731
Sidlow and Msaouel (2015) ⁴⁵	3012/6577	851/7764
Condon (2018) ⁴⁶	236/775	35/649
Armstrong et al (2018) ⁴⁷	1685/6481	351/8768
Tapp et al (2020) ⁴⁸	13726/60422	1934/59632
Yeboah-Korang et al (2018) ⁴⁹	5451/45188	131/10089
Yartel et al (2018; study 2) ²⁵	2757/8928	197/5547
Federman et al (2017) ⁵⁰	2995/8713	198/5438
Teply et al (2018) ⁵¹	5685/29913	482/29703
Byrne et al (2014) ⁵²	18/45	2/47
Trinh and Turner (2018) ⁵³	45/50	12/51
Konerman et al (2017) ⁵⁴	19847/27789	1705/22488
Gemelas et al (2016) ⁵⁵	593/785	47/983
Wang et al (2020) ⁵⁶	15391/18095	314/11836
Subtotal ($I^2=99.8\%$; $p<0.001$)		

Medical chart reminders

Morales-Arreaz et al (2019) ⁹⁴	139/179	264/423
Scott et al (2020) ⁹⁵	2017/2151	397/462
Konerman et al (2017) ⁵⁴	168/178	31/36
Tapp et al (2020) ⁴⁸	430/442	122/179
Subtotal ($I^2=90.4\%$; $p<0.001$)		



Testing

Linkage to care

Further actions required to simplify testing

- Identify and address barriers to adoption of reflex HCV RNA testing
- Identify strategies to improve treatment uptake following DBS testing
- Explore cost-effective HCV testing strategies in low prevalence settings
- Identify and address barriers to point-of-care testing scale-up (operator training, research requirements, quality assurance, IT/connectivity)

Further actions required to enhance patient engagement

- Need to facilitate broader implementation and expansion of peer-based support into clinical practice
- Should we expand the use of care coordinators in Australia, given success elsewhere?
- Need to identify and implement interventions to enhance post-treatment follow-up

Further actions to improve provider engagement

- Expanded use of medical chart reminders and/or clinical case audits
- Continued development of the provider workforce (particularly peers) with a focus on implementation of interventions to enhance HCV testing and treatment
- Increased funding for infrastructure to support workforce for the delivery of interventions to enhance HCV care (nursing support, peer-support, patient navigation)

Acknowledgements



Queensland Health



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