

Novel HCV Screening Strategies for Hard to Reach Populations: Are they Cost-Effective?



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Introduction

The World Health Organisation target for HCV elimination by 2030 has broadened the boundaries of the HCV debate to strategic and economic considerations. Understanding how to prioritize screening to reach infected undiagnosed individuals is therefore crucial. This is imperative in countries like the UK, where the relatively low prevalence does not justify screening the entire country population, but nearly half of the infected individuals are undiagnosed.

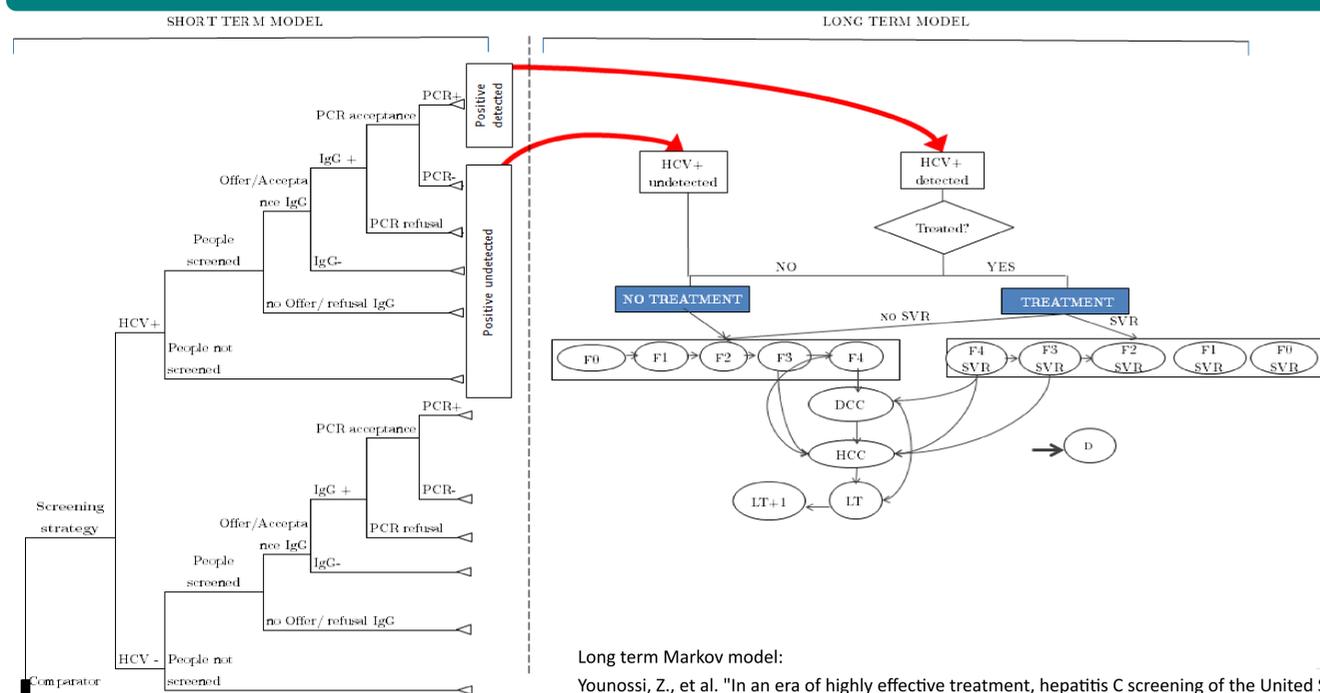
Aim & Objectives

This study aims to identify and assess the most cost-effective strategies for diagnosing HCV infection in four different macro populations. The identified populations are: 1. *recently ceased or current People Who Inject Drugs (PWID)* 2. *General Population* 3. *Immigrants from Endemic Countries* 4. *Prisoners*. Here, results focus on 1. PWID and 2. remote PWID found within the general population. These populations have the highest prevalence and incidence but low detection rates. Each strategy was compared against the standard care diagnostic pathway for the Scottish NHS perspective (a symptomatic detection during a GP consultation). Nine strategies (including the standard screening strategies) across the four populations were compared in the original study.

Strategies Compared with Standard Symptomatic Screening at GPs

Population	Strategy	Description
PWID	Substance Misuse Service	Persons on opiate substitution therapy offered to test with dried blood spot sampling at first contact with Substance Misuse Service
	Needle Exchange Services	Patients attending Needle Exchange Services offered a HCV test with dried blood spot sampling.
	Pharmacies	Offering test to clients receiving Opiate substitution therapies or injecting equipment at dispensing pharmacies
General population	GP Targeted screening: high social deprivation areas	Patients between 30-54 attending GP visits for any reason in areas with high social deprivation offered leaflet and HCV testing.
	GP Targeted screening: individuals living in high social deprivation areas with a history of PWID	Patients between 30-54 attending GP visits for any reason in areas with high social deprivation with a history of PWID offered testing.

Methods



Long term Markov model:

Younossi, Z., et al. "In an era of highly effective treatment, hepatitis C screening of the United States general population should be considered." *Liver International* 38.2 (2018) 258-265.

This is an anonymised retrospective study using routine health service data related to NHS Tayside (Scotland) and data output from published studies referring to Scotland to compare and evaluate different diagnostic strategies for HCV screening. The cost-effectiveness analyses are undertaken using both a short term and lifetime models.

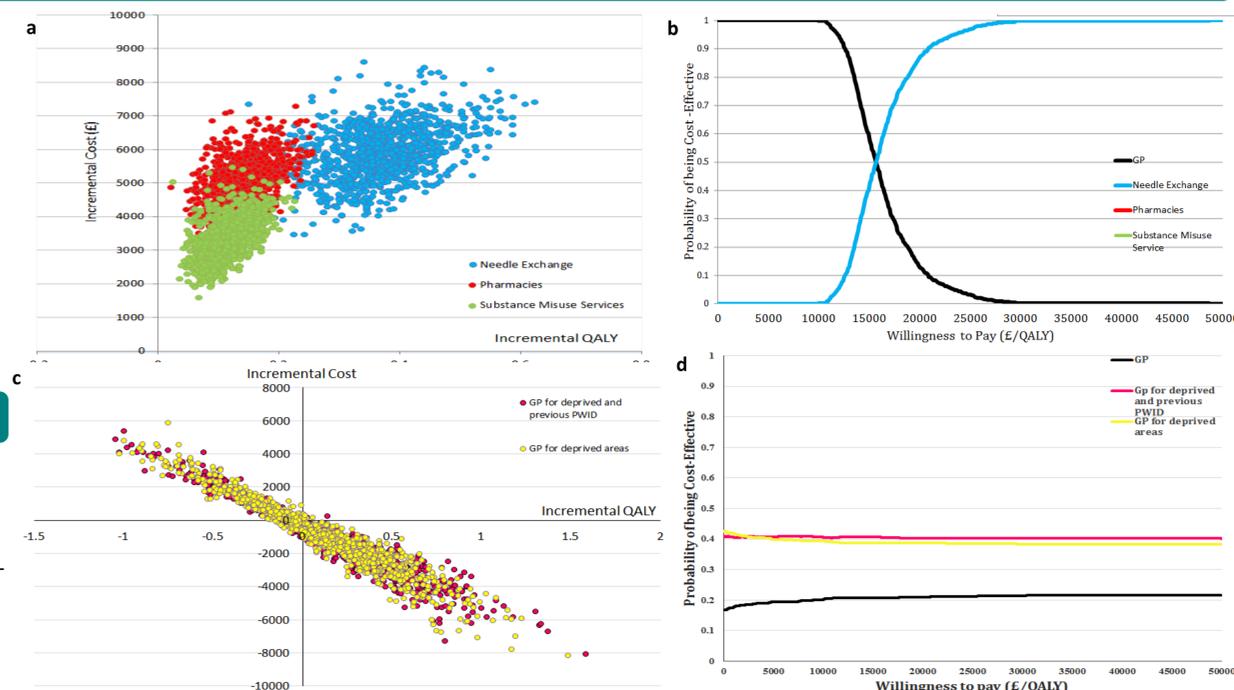
The short term analysis uses a decision tree populated with data directly from observational studies to determine the cost per additional case detected.

The long term analysis is a cohort Markov Model previously published (Younossi 2018), which extrapolates the short term results to determine the net monetary benefit and the incremental cost per additional quality adjusted life year (QALY) gained.

Short term- Results

Short term	Strategy	Expected cost per patient	% detected out of total positive in the population	Cost per positive detected
PWID	GP	£ 6	4%	£335
	Substance Misuse Services (SMS)	£15	23%	£150
	Needle Exchange Services	£19	29%	£153
	Pharmacies	£23	22%	£208
General population	GP	£1	3%	£1768
	GP targeting deprived areas	£2	5%	£4309
	GP targeting deprived and PWID	£1	6%	£1380

Long term - Results



Cost-effectiveness plane (left) and Cost-Effectiveness Acceptability Curve (right) for the screening strategies. Figures a&b refer to PWID population strategies; figures c&d refer to the general population strategies.

Conclusions

- Cost effective strategies can differ between short and long term. Results are context specific.
- Main drivers for a strategy to be cost effectiveness are:
 1. Average age of diagnosis, 2. Compliance in the cascade of care, 3. Cost of the treatment.
- The most cost-effective strategy in Tayside (Scotland) for drug users is providing HCV tests at Needle Exchange Services with a 7.5-fold increase in detecting positive individuals in respect to the reference strategy, and a NMB of £162,625 (with a £20,000 threshold) over a patient lifetime.
- Targeting specific cohorts attending GP visits is likely to be cost-effective compared to the GP symptomatic screening, yet there is high uncertainty. Further evidence is needed to confirm the findings.