

# Screening and treatment of hepatitis C in adults of general population in Spain is cost-effective

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## INTRODUCTION

- In Spain, there are still many people undiagnosed with Chronic hepatitis C<sup>1</sup>. Screening strategies need to be established for detection of this population<sup>2</sup>. However, the Spanish guidelines only recommend performing Hepatitis C Virus (HCV) screening in patients with high risk of HCV infection<sup>3</sup>.
- HCV therapies based on direct-acting antiviral agents (DAA) are fully reimbursed in Spain regardless of the degree of hepatic fibrosis making identification of these patients key for elimination of infection<sup>4</sup>.
- HCV screening of the general population would allow early diagnosis and treatment of asymptomatic patients, preventing disease progression<sup>2</sup>.

## OBJECTIVE

- To assess the efficiency (cost-utility analysis) of HCV screening and subsequent treatment of three different HCV screening strategies:
- All adults of general population
  - Adults of high-risk groups
  - Selected adult population based on the highest rate of anti-HCV prevalence
- The analysis was performed from the perspective of the Spanish National Health System.

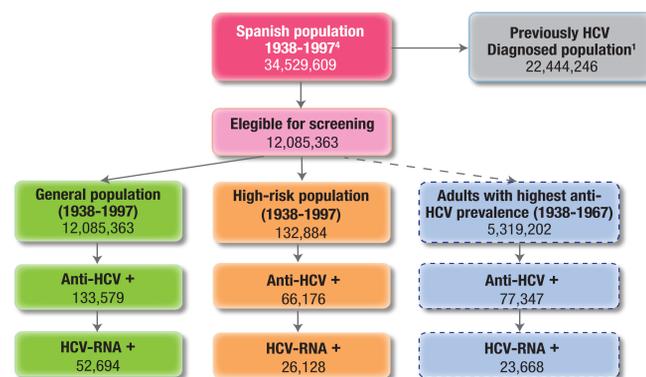
## METHODS

- An analytical decision analysis model was developed to assess the efficiency, measured as quality-adjusted life years (QALY), and total lifetime costs of the patient in three population:
  - Adult general population undiagnosed with HCV born between 1938-1997 (20-79 years).
  - The high-risk population (prisons, injecting drug users, HIV/HCV co-infected patients) born between 1938-1997 (20-79 years).
  - Adult population undiagnosed with the highest anti-HCV prevalence born between 1938-1967 (50-79 years).

### Population

- The population eligible for screening and diagnosis of chronic hepatitis C was estimated from a decision tree.
- 35 percent<sup>1</sup> of the total Spanish population<sup>4</sup> (34,529,609 individuals born 1938-1997 and 15,197,719 individuals born 1938-1967) was considered as non-diagnosed patients or had not undergone an anti-HCV antibody test (Figure 1).
- In the general population, an anti-HCV prevalence of between 0.5-1.5%<sup>1</sup> and a viral load (HCV-RNA+) rate of 31.5%<sup>1</sup> was estimated (Figure 1).
- The high-risk population screened and diagnosed with hepatitis C was estimated from several Spanish studies<sup>5-14</sup> (Figure 1).
- In the highest anti-HCV prevalence population, an anti-HCV prevalence of 1.54%<sup>1</sup> and a viral load (HCV-RNA+) rate of 30.6%<sup>1</sup> was considered (Figure 1).
- Viral screening was performed by a single anti-HCV measurement at 100% of the population undiagnosed and diagnosis of hepatitis C was made by the presence of HCV-RNA.

Figure 1. Population flow diagram



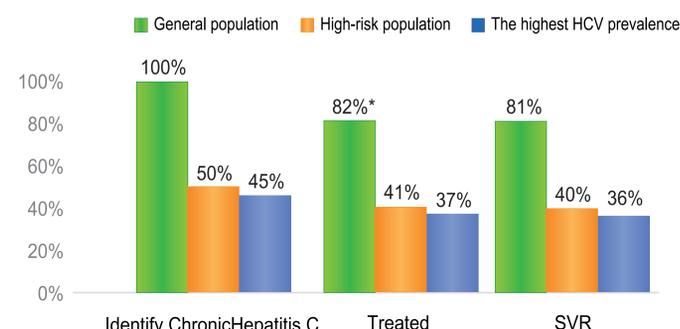
Anti-HCV, anti-HCV antibodies; HCV, hepatitis C virus

### Model

- The progression of chronic hepatitis C from diagnosis to lifetime was simulated using a previously validated Markov model<sup>15</sup>.
- It was considered that 82%<sup>16</sup> of patients with chronic hepatitis C would receive treatment with DAA, with a 98% sustained virologic response (SVR)<sup>17</sup>.
- Annual transition probabilities between health states<sup>18-24</sup> and quality of life for each health state<sup>24</sup> were obtained from the literature.
- Total cost (€, 2017) included diagnostic tests<sup>25,26</sup>, drug and monitoring during treatment<sup>27</sup> and disease management by health status<sup>24,27</sup>. The pharmacological cost was calculated from the total number of patients treated in Spain and its associated cost published by official bodies<sup>28</sup>.
- A 3% discount rate was applied<sup>29</sup> to costs and health outcomes.
- Cost-effectiveness threshold is more commonly used term €22,000 - €30,000<sup>30,31</sup> per QALY gained.

## RESULTS

Figure 2. New patients identified with Chronic hepatitis C, treated and with SVR



Population Group	Identify Chronic Hepatitis C	Treated	SVR
General population	52,694	43,209	42,691
High-risk population	26,128	21,425	21,168
The highest HCV prevalence	23,668	19,408	19,175

\* 82% of patients with chronic hepatitis C would receive treatment with DAA<sup>16</sup> SVR, sustained virological response

- Implementation of HCV screening in the general population would double or more the number of patients identified, treated, and "cure" (Figure 2).

Table 1. Results of cost-utility analysis per patient with chronic hepatitis C

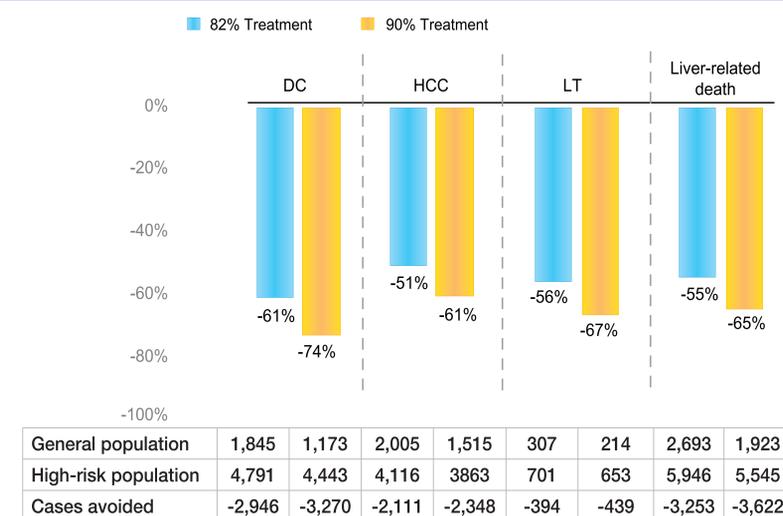
	Total cost	QALY	ICUR
<b>General population vs high-risk population</b>			
General population	€35,497	18.7	€8,914
High-risk population	€17,339	16.7	
Difference	€18,157	2.0	
<b>General population vs the highest anti-HCV prevalence</b>			
General population	€35,497	18.7	€226
The highest anti-HCV prevalence	€34,640	14.9	
Difference	€857	3.8	

ICUR, Incremental Cost-Utility Ratio

- Screening in the general population would generate better health outcomes compared to the high-risk population and to the highest HCV prevalence per patient, though with greater total costs. The Incremental Cost-Utility Ratio (ICUR) per patient with chronic hepatitis C of both comparisons are below the efficiency threshold accepted in Spain (€22,000-€30,000) (Table 1).

## RESULTS

Figure 3. General population vs high-risk population. Percentage reduction in advanced liver disease (82% vs. 90% treated patients)



DC, decompensated cirrhosis; HCC, hepatocellular carcinoma; LT, liver transplantation

- Considering 82% of treated patients, screening in the general population would result in a reduction in high disease burden compared with screening for high-risk population (Figure 3).
- An increase in treated patients (from 82% to 90%) would represent a significant increase in the number of liver complications avoided (Figure 3).

## CONCLUSIONS

Comparing the three strategies, screening and subsequent treatment for HCV in adults of the general population is cost-effective. These findings are relevant in supporting WHO recommendations for HCV elimination.

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