Resource utilization: the value of anti-HCV treatment screening

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Background

Are DDA Cost Effective?

Cost Effectiveness Analysis of The Use of Daclatasvir for the Treatment of Hepatitis C Virus (Hcv) Genotypes 3 in Cirrhotic Patients Within the Italian National Health Service.

Budget impact analysis of sofosbuvir-based regimens for the treatment of HIV/HCV-coinfected patients in northern Italy: a multicenter regional simulation.

Cost Analysis of Residual Viremia Detected by Two Real-Time Pcr Assays For Response-Guided (Dual Or Triple) Therapy of Hcv Genotype 1 Infection.

The optimal timing of hepatitis C therapy in liver transplant-eligible patients: Cost-effectiveness analysis of new opportunities.

Is early treatment an effective cost intervention?

Modeling cost-effectiveness and health gains of a "universal" versus "prioritized" hepatitis C virus treatment policy in a real-life cohort.

Health policy model: long-term predictive results associated with the management of hepatitis C virus-induced diseases in Italy.

Early Treatment in HCV: Is it a Cost-Utility Option from the Italian Perspective?
Does the investment that the NHS has made in the last few years for the purchase of the DAA provide for a return on investment?

After how long will we get acceptable economic returns?
PharmacoEconomics
https://doi.org/10.1007/s40273-018-0733-3

ORIGINAL RESEARCH ARTICLE

Economic Consequences of Investing in Anti-HCV Antiviral Treatment from the Italian NHS Perspective: A Real-World-Based Analysis of PITER Data

Andrea Marcellusi¹,²,∗ · Rafaela Viti¹ · Loreta A. Kondili³ · Stefano Rosato³ · Stefano Vella³ · Francesco Saverio Mennini¹,² on behalf of PITER Collaborating group available at www.progetto-piter.it

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The model simulated the cost incurred by the NHS for the period 2014/2015, 2016 and 2017 in terms of direct medical costs based on the stratification of fibrosis and genotypes from the largest real database of patients treated with HCV.
Method: projection

In any health state, a patient could die due to other causes.

HCV-related Death

F0 → F1 → F2 → F3 ➔ SVR from F0-F3

Compensated Cirrhosis (F4) ➔ Decompensated Cirrhosis (DC) ➔ HCC ➔ SVR from ILD states

Transplant (procedure) ➔ Transplant (following years)

F1 ➔ F3

HCC

SVR from ILD states
Results:

- Standardization for 1,000 treated patients

2014-15
Results:

- Standardization for 1,000 treated patients

2016

[Graph showing costs and avoided cases in euros and years, with labels indicating avoided HCV related cases and cost difference vs No Treatment.]
Results:

- Standardization for 1,000 treated patients

2017
Results: sensitivity analysis

- Are we doing something wrong?
Results: sensitivity analysis

![Graph showing results of sensitivity analysis over 2016.](image)
Results: sensitivity analysis

2017

€ 50,000,000
€ 30,000,000
€ 10,000,000
-€ 10,000,000
-€ 30,000,000
-€ 50,000,000
-€ 70,000,000

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

With reference to patients treated in 2016 and 2017 (years in which patients were treated in less compromised disease states), the clinical events avoided made it possible to obtain a return on the initial investments for the purchase of the DAAs estimated respectively in 6, 6 and 6.2 years.

A growing trend is evident that the estimated return on investment of the national health system in this study will continue in the future, leading to lower investments and faster returns.

(cfr. Marcellusi, Mennini et al., 2015; Lanini et al., 2018).
Screening strategies for hepatitis C virus elimination in Italy

I. Gamkrelidze¹, L. Kondili², A. Marcellusi³, S. Robbins¹, S. Blach¹, A. Craxi⁴, M. Puoti⁵, H. Razavi¹, F.S. Mennini³

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Italy in 2018 ranks among the 12 countries that have positively set out to eliminate the HCV. But to do this we have to find the "submerged" and treat them.
Elimination scenarios: 4 screening strategies vs status quo

- Universal screening
- Screening in birth cohorts 1948–77
- Screening in birth cohorts 1958–77
- Graduated birth cohorts screening

- birth years 1968–1987 beginning in 2020 to identify young populations at risk for transmitting HCV,
- expanding to 1948–1967 beginning in 2023 to identify older populations before their disease advances
### Parameters used for screening scenarios

<table>
<thead>
<tr>
<th>GHSS elimination</th>
<th>&lt;2020</th>
<th>2020-2022</th>
<th>2023-2025</th>
<th>% PWID*</th>
<th>Screening Cost (per person, €)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening Universale</td>
<td>Risk</td>
<td>Tutta la popolazione</td>
<td>Tutta la popolazione</td>
<td>6.2%</td>
<td>17</td>
</tr>
</tbody>
</table>

GHSS — Global Health Sector Strategy; PWID — Persons who inject drugs; Risk — risk-based screening assumes that those offered a test are approximately 5 times more likely to be infected than the general population. PWID prevalence – United Nations Office on Drugs and Crime.

For PWID the model considered a cost of 50 euros (5 times higher than the general population).
## Results

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Cost (€ millions), 2018–2031</th>
<th>QALYs Gained, 2018–2031</th>
<th>ICER Relative to Status Quo (€/QALY)</th>
<th>ICER relative to previous least costly scenario (€/QALY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status quo</td>
<td>5,463</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>GHSS Targets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduated Screening</td>
<td>5,974</td>
<td>144,000</td>
<td>3,552</td>
<td>3,552</td>
</tr>
<tr>
<td>Screening 1948–1977</td>
<td>6,081</td>
<td>142,000</td>
<td>4,349</td>
<td>*</td>
</tr>
<tr>
<td>Screening 1958–1977</td>
<td>6,083</td>
<td>128,000</td>
<td>4,831</td>
<td>*</td>
</tr>
<tr>
<td>Universal Screening</td>
<td>6,441</td>
<td>145,000</td>
<td>6,758</td>
<td>562,855</td>
</tr>
</tbody>
</table>

ICER — incremental cost-effectiveness ratio; QALY — quality-adjusted life year;
GHSS — Global Health Sector Strategy;
The cost-effectiveness threshold was set at €25,000
* Strongly dominated scenario (costlier and less effective than another scenario)
Graduated screening is the most cost-effective strategy, producing an ICER of € 3,552 per QALY.

Universal screening is cost-effective compared to the status quo (ICER of € 6.758 per QALY) but not compared to graduated screening.
In Italy, the implementation of a graduated screening, starting with the 1968–87 birth cohorts, to follow later with the screening of the oldest birth cohorts 1948–67 is the strategy most cost effective in achieving the elimination goals.

This screening strategy could be considered to support Italy's path towards the elimination of HCV.
DAAs could reduce the weight of HCV over the next two decades.

The break-even point analysis, discounted in terms of time, has shown that the current investment for the treatment of AADs is largely cost saving.
Final remarks

Investing means improving health but also having an economic return in the medium to long term. Statistical models are the only method for projecting future costs, but they are useless if they are not confirmed by real data. Future real-world analyzes of the total number of patients treated in Italy to date are confirming the validity of the investment.

This study can be a useful tool for public decision makers to understand how the epidemiological profiles of HCV influence the economic weight of HCV.
THANKS

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