

EPIDEMIOLOGICAL AND ECONOMIC IMPACTS OF POTENTIAL HCV SCREENING STRATEGIES FOR THE NEXT 5 YEARS IN FRANCE

Leleu H¹, Volant J², Hauvespre A³, Rodriguez I⁴, Blachier M¹, Roudot-Thoraval F⁵

CONTEXT

In France, 43% of HCV infected patients remained undiagnosed in 2004 and still 19% [5%-56%] were estimated undiagnosed in 2016. Previous studies have shown that screening strategies can be efficient, depending on treatment uptake and HCV prevalence in the targeted population. Two different strategies are usually combined: targeted screening strategies on subjects at high-risk of infection (PWID and immigrants) and General Population (GenPop) campaigns that generally target subjects of determined age and/or sex.

OBJECTIVE

TO DETERMINE THE EPIDEMIOLOGICAL AND ECONOMIC VALUE OF FIVE SCREENING STRATEGIES IN THE FRENCH CONTEXT.

METHODOLOGY

A decision tree combined with a previously published¹ Markov model was used (Figure 1). Three populations were modeled:

- Person who inject drugs (PWID) [HCV prevalence: 74.8%², PCR+: 49%, F0/F2: 88%, F3: 5%, F4: 7%]
- Immigrants [prevalence: 3.1%, PCR+: 48%³, F0/F2: 80%, F3: 10%, F4: 10%]³
- GenPop [prevalence: 0.03%-0.27% depending on age & sex, PCR+: 70%⁴, F0/F2: 68%, F3: 16%, F4: 16%]⁴

Costs were associated to treatments, screening and healthcare states based on the literature⁵. A 90%-95% SVR rate was used.

Five screening strategies were compared (table 1) including the currently observed screening rates. Results were estimated for a 5 years screening, with complications estimated over a lifetime horizon.

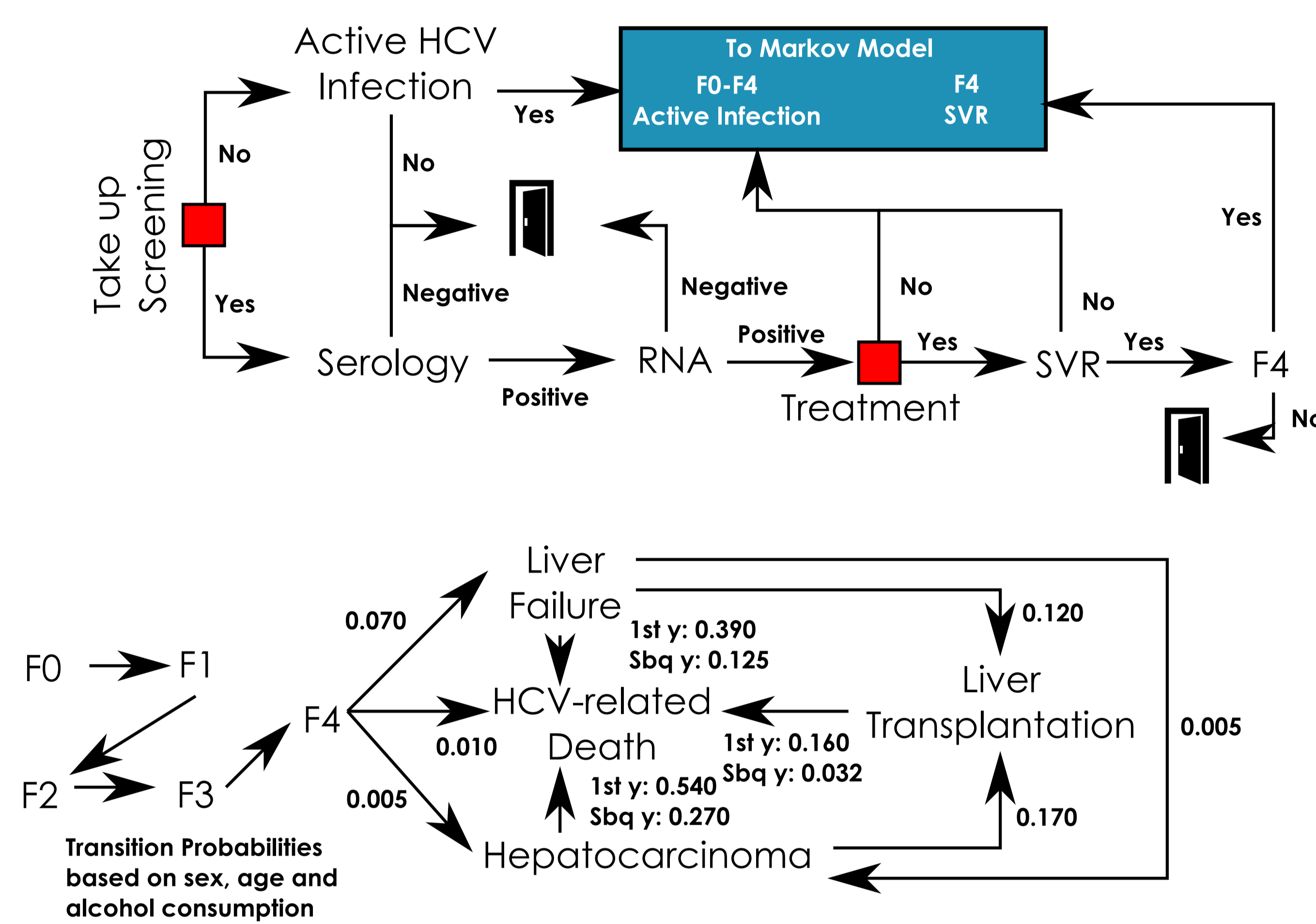


Figure 1. Decision Tree (Top) and Markov Model (Bottom) Structure, Red squares correspond to scenarios assumption (screening rate, treatment uptake)

Table 1. Scenarios compared (Screening rates / Treatment uptake)
HR: High Risk (PWIDS, Immigrants), y: years

Population	S1	S2	S3	S4	S5
GenPop	4.7% / 95%	4.7% / 95%	<60y: 18.0%, ≥60y: 4.7% / 95%	<40y: 4.7%, ≥40y: 18.0% / 95%	18.0% / 95%
PWID	19.2% / 72%	19.2% / 95%	19.2% / 95%	19.2% / 95%	19.2% / 95%
Immigrants	2.2% / 41%	18.2% / 41%	18.2% / 41%	18.2% / 41%	18.2% / 41%

CONCLUSION

GENPOP SCREENING PROGRAMS SEEM TO BE THE ONLY OPTIONS TO SIGNIFICANTLY REDUCE THE RATE OF UNDIAGNOSED HCV PATIENTS. THESE OPTIONS CAN BE COST-EFFECTIVE IF THEY ARE INTEGRATED IN THE ROUTINE CARE WITH THE INVOLVEMENT OF GENERAL PRACTITIONERS (GP).

- Results are presented in table 2. Compared to the current scenario, increased screening intensity (scenario 2 to 5) were associated with an increasing number of avoided cirrhosis (3,100 to 18,100), cirrhosis complications (2,500 to 20,500) and HCV-related death (1,700 to 7,200) for an increasing costs per new diagnosis (€2,300 to €8,300).
- Compared to current scenario, only intensified screening including the general populations aged 40-80 (S4) or 18-80 (S5) were cost-effective with ICER under a €30,000/QALY threshold.

Table 2. Epidemiological results (in thousands) (Top) & Cost-Effectiveness results (bottom).

	Cirrhosis	Comp.	Death	Scr. Costs*
S1	Ref.	Ref.	Ref.	2,200
S2	3,100	2,500	1,700	2,300
S3	11,600	12,700	4,900	6,400
S4	15,700	17,500	6,300	6,300
S5	18,100	20,500	7,200	8,300

	dQALY	C ũ (€)	ICER
S1	12.9	30,322.9	Ref.
S2	13.1	32,831.7	Ext. Dominated
S3	13.8	37,326.2	Ext. Dominated
S4	14.1	37,644.9	€ 6,352 /QALY
S5	14.3	39,712.3	€ 10,155 /QALY

* Per additional diagnosed individual

References

1. Leleu H, Blachier M, Rosa I. Cost-effectiveness of sofosbuvir in the treatment of patients with hepatitis C. Journal of viral hepatitis. 2015;22(4):376-83.
2. Weill-Barillet L, Pillonel J, Semaille C, Leon L, Le Strat Y, Pascal X, et al. Hepatitis C virus and HIV seroprevalences, sociodemographic characteristics, behaviors and access to syringes among drug users, a comparison of geographical areas in France, ANRS-Coquelicot 2011 survey. Revue d'épidémiologie et de santé publique. 2016;64(4):301-12.
3. Françoise Roudot-Thoraval IR-H, Isabelle Delacroix-Szmania. Management of precarious populations after systematic testing of hepatitis B and C in primary healthcare settings: the Precavir study 2007-2015. Journal of hepatology. 2017.
4. Brouard C, Le Strat Y, Larsen C, Jauffret-Roustide M, Lot F, Pillonel J. The undiagnosed chronically-infected HCV population in France. Implications for expanded testing recommendations in 2014. PloS one. 2015;10(5):e0126920.
5. Victor de Lédighen BH, Dominique Larrey. Caractéristiques épidémiologiques des patients pris en charge pour hépatite chronique virale C en France en 2015 : étude Émeraude. AFEF2015.
5. M. Schwarzingler SD-B, V. Mallet. LIFETIME COSTS ATTRIBUTABLE TO CHRONIC HEPATITIS C FROM THE FRENCH HEALTHCARE PERSPECTIVE (ANRS N°12188). Journal of hepatology. 2013;58.