

# Preventing liver disease with policy measures to tackle alcohol consumption and obesity: a microsimulation study – Hepahealth II

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## Introduction

- Europe has the largest burden of diagnosed liver disease globally, with almost 30 million people in the European Union alone estimated to be living with a chronic liver condition.
- Europe has high levels of alcohol consumption, which together with ultra-processed food consumption and a high prevalence of obesity, are the major drivers of liver-related morbidity and mortality.
- We need to estimate the future burden of liver disease and the potential impact of different policy interventions.

## Aim

- To estimate the impact of several policy interventions targeting alcohol and obesity on the incidence of CLD and primary liver cancer in France, the Netherlands and Romania.

## Methods

- A validated and peer-reviewed microsimulation model.
- Dynamic virtual populations of France, The Netherlands, and Romania generated based on population data from the United Nation.
- Epidemiological and cost data for liver diseases extracted from published literature and databases and applied to this virtual population.
- Outcomes: the burden of CLD and liver cancer versus an inaction scenario between 2022 and 2030.
- The policies modelled were 1€ minimum unit pricing (MUP) on alcohol; a combination of 0.7€ MUP and a sugar sweetened beverage (SSB) tax; and a combination of 0.7€ MUP, SSB tax and a volumetric tax on alcohol.

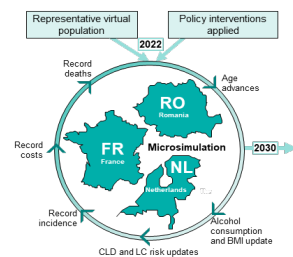


Figure 1: Methods

## Results

- All three policies had an important impact on incidence of liver disease, with reductions in annual incidence ranging from 2% to 7% by 2030.
- The 1€ MUP policy had the largest predicted impact: resulting in 11,550 fewer cases of CLD and 7,921 fewer cases of liver cancer compared with the inaction scenario in the three countries combined, by 2030 (Figure 2).
- The combined policy intervention of a 0.7€ MUP, an SSB tax, and a volumetric tax on alcohol would prevent nearly as many cases: resulting in 7,317 fewer cases of CLD and 5,390 fewer cases of liver cancer compared with the inaction scenario by 2030 in the three countries combined (Table 1).
- The combined policy intervention of a 0.7€ MUP and a volumetric tax on alcohol would result in 5,672 fewer cases of CLD and 4,241 fewer cases of liver cancer by 2030 in the three countries.
- All policies also showed large reductions in healthcare costs, in particular, the 1€ MUP would see France avoiding €612M in costs for liver cancer and the Netherlands avoiding €9M costs for CLD by 2030.

## Reduction in cumulative incident cases by 2030 if the country implemented a 1€ minimum unit price

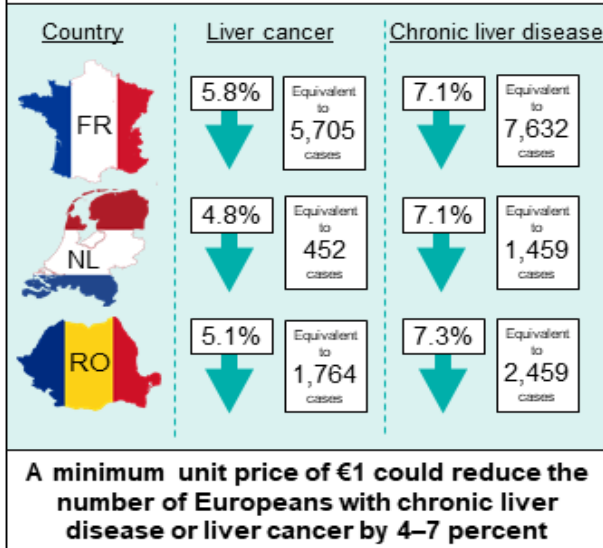


Figure 2: Visual summary of key findings for implementation of a 1€ MUP

Country	Prediction scenario	Chronic liver disease			Liver cancer		
		Total predicted reduction in number of cases by 2030 (±SD)	2030 annual incidence (per 100,000 individuals) (±SD)	Reduced cases as % of expected cases under inaction scenario	Total predicted reduction in number of cases by 2030 (±SD)	2030 Annual incidence (per 100,000 population) (±SD)	Reduced cases as % of expected cases under inaction scenario
France	Inaction	-	17.90 (±0.26)	-	-	17.34 (±0.26)	-
	0.7€ MUP & SSB tax	3,851 (±738)	17.27 (±0.26)	3.58	3,057 (±703)	16.80 (±0.25)	3.13
	0.7€ MUP, SSB tax & Volumetric tax	4,922 (±736)	17.11 (±0.26)	4.57	3,866 (±702)	16.66 (±0.25)	3.95
	1€ MUP	7,632 (±731)	16.76 (±0.25)	7.09	16.31 (±0.25)	13.9 (±0.73)	5.83
Netherlands	Inaction	-	13.04 (±0.22)	-	-	6.35 (±0.16)	-
	0.7€ MUP & SSB tax	730 (±165)	12.59 (±0.22)	3.56	264 (±112)	6.12 (±0.15)	2.81
	0.7€ MUP, SSB tax & Volumetric tax	946 (±164)	12.47 (±0.22)	4.61	332 (±112)	6.07 (±0.15)	3.53
	1€ MUP	1,459 (±163)	12.21 (±0.22)	7.12	6.01 (±0.15)	51.59 (±0.45)	4.81
Romania	Inaction	-	19.52 (±0.28)	-	-	21.51 (±0.30)	-
	0.7€ MUP & SSB tax	1,091 (±222)	18.94 (±0.28)	3.23	920 (±225)	20.89 (±0.29)	2.68
	0.7€ MUP, SSB tax & Volumetric tax	1,449 (±222)	18.75 (±0.28)	4.29	1,191 (±224)	20.72 (±0.29)	3.47
	1€ MUP	2,459 (±220)	18.28 (±0.27)	7.28	20.38 (±0.29)	17.4 (±0.82)	5.14

Table 1: Key results for the reduction of incidence of chronic liver disease and liver cancer for both combined intervention scenarios

## Conclusions

- There is an importance in targeting multiple drivers of obesity and alcohol consumption simultaneously to reduce the number of Europeans who develop CLD or liver cancer.
- The best scenarios are an increased MUP of 1€ on alcohol or introducing a set of complementary public health policies targeting an increased MUP, an SSB tax, and a volumetric tax that target both alcohol consumption and obesity.

This study has been supported by an unrestricted education grant from Bristol-Myers Squibb and Gilead. Bristol-Myers Squibb and Gilead have had no input into EASL content.