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# Reducing alcohol burden: a cost-benefit analysis of a French alcohol prevention campaign

## BACKGROUND

The French public health agency has launched in March 2019 a one-month national campaign, called *Ravages*, focusing on the long-term alcohol-related harms (cancer, hypertension, hemorrhagic stroke) and the French low-risk drinking guidelines (no more than two drinks per occasion, no more than five days per week, and no more than ten drinks per week). It aimed to improve knowledge and in turn to reduce alcohol consumption.

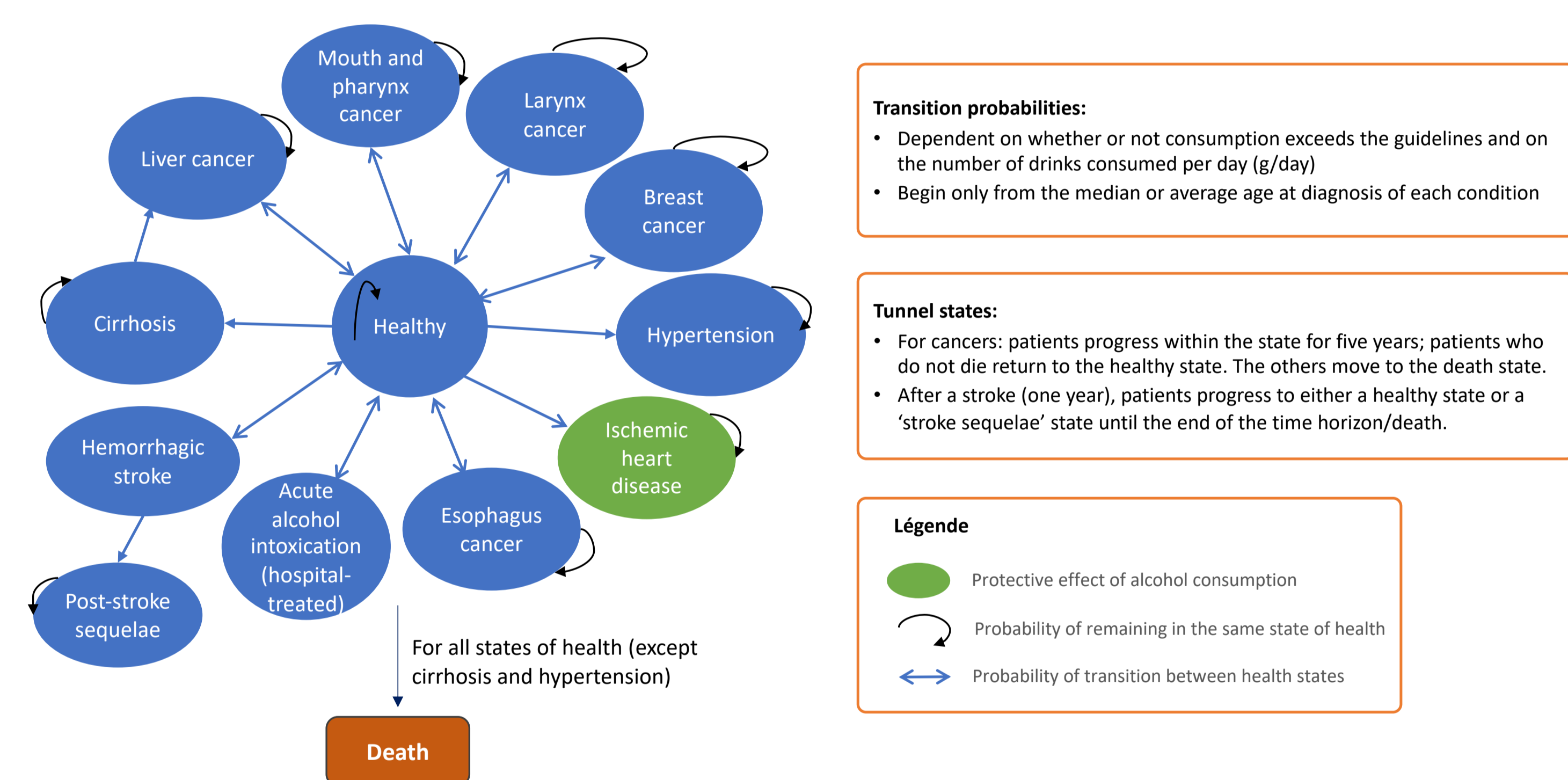
## METHODS

**Study design.** A cost-benefit analysis was conducted, with both costs and health benefits measured in monetary terms, to calculate a return on investment (ROI), corresponding to the ratio of monetized benefits (here, avoided health-care costs due to alcohol-attributable morbidity and mortality) to program costs.

The model was developed to compare the annually repeated diffusion of the campaign with no intervention in the 18-75 drinkers' population, over a 30-year period. The reference analysis adopted a health care system perspective.

**Model structure and alcohol-related risks.** A decision-tree followed by a semi-Markov model with 13 health states, based on Corrao et al (2004), Roerecke et al. (2018), Smyth et al. (2023).

Figure 1 | Semi-Markov model



**Costs.** Health system costs per patient-year were sourced from National Health Insurance and associated to each health state. The mean annual cost of the campaign was estimated at €4,020,415.

**Effectiveness of the campaign.** Effectiveness estimates were based on the 2019 longitudinal evaluation of the campaign, with measures at baseline (T0), at one-month follow up (T1), and at six months (T2). The adjusted relative risk (RR) of exceeding French low-risk drinking guidelines for exposed versus non-exposed individuals was 0.895 [95% CI: 0.804-0.997; p=0.044] at T1 and 1.05 [95% CI: 0.94-1.18; p=0.403] at T2. For each theoretical annual campaign diffusion, the effect observed at T1 was applied for the first month, followed by a linear decrease to null by month six and no effect for months seven to twelve.

Following the scientific committee's recommendations, an annual repetition effect (+1% effectiveness improvement per diffusion for 20 years, then plateau) was included, resulting in a 27% stronger effect at year 30 compared to year 1. This choice is based on previous studies that suggest an effect of advertising repetition, in particular when the involvement of the population is initially low.

**Outcomes.** To assess the uncertainty around the results, 16 scenarios analyses were conducted. One scenario is a societal perspective analysis including the valuation of years of life lost due to premature death (related to alcohol-diseases and road-traffic mortality).

## RESULTS

- **The cost-benefit analysis estimated a ROI of €7 for €1 spent for the campaign in a healthcare system perspective.**
- Hypertension contributed the largest share of savings (45%) because of the high prevalence in the French population, followed by acute alcohol intoxication (38%) because of the high cost of hospitalizations.
- **All scenarios showed positive returns.** Scenario analyses indicated that ROI of *Ravages* campaign was mainly sensitive to the time horizon, effectiveness persistence, repetition effect rate, and population exposure.
- **From a societal perspective, the ROI was found to be nearly 3 times higher than for the health care system perspective (€20 avoided for €1 invested),** and non-significantly with perceived effectiveness on thinking about own smoking (aOR = 1.4 [1.0-1.9], p = 0.06). No other significant association was observed for subsequent editions of the campaign.

## CONCLUSION

Well-designed alcohol prevention campaigns can not only modify attitudes and health-risk behaviors but also produce long-term financial savings for the health system. These results support the dissemination of efficient mass media campaigns to prevent alcohol consumption in the general population.

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Table 1 | Alternative scenarios analysis: impact on ROI compared to base case

Main Analysis	Scenario	ROI	Variation vs. Reference Analysis
<b>Structural choices</b>	Scenario 1: Limited societal perspective including cost of years of life lost (premature death and road accidents related to alcohol)	€20.27	173%
	Scenario 2: 10 years	€1.72	-77%
<b>Time horizon fixed (30 years)</b>	Scenario 3: 20 years	€4.73	-36%
	Scenario 4: 40 years	€8.88	19%
	Scenario 5: 0%	€8.66	16%
<b>Discount rate 2.5%</b>	Scenario 6: 4%	€6.74	-9%
	Scenario 7: No effect after 1 month	€2.30	-69%
<b>Effectiveness</b>	Scenario 8: Linear decay of effect to reach RR observed at T2 (RR>1)	€4.63	-38%
	Scenario 9: No repetition effect	€1.38	-81%
<b>Campaign repetition effect</b>	Scenario 10: Repetition effect at 0.5%	€4.50	-40%
	Scenario 11: Diffusion twice per year with maintained effectiveness	€6.67	-10%
<b>Campaign effect applied to 100% of consumers</b>	Scenario 12: Campaign reaches only 75% of consumers aged 18-75	€5.58	-25%
<b>Alcohol consumption levels</b>	Scenario 13: Drinks estimated on subgroup exceeding guidelines at T0 and not exceeding at T1	€6.04	-19%
<b>Health states</b>	Scenario 14: No protective effect of alcohol consumption on coronary heart disease risk	€7.50	1%
<b>Relative risks estimated from Corrao et al. 2004</b>	Scenario 15: RR estimated in GBD 2019 (IHME)	€8.33	12%
<b>Assumption of equal probability of developing modeled pathologies in general population and non-drinkers</b>	Scenario 16: Initial annual incidence from 'Healthy' state for modeled pathologies (-10%)	€7.23	-3%