

Background

- To compare the economic impact of different healthcare innovations, it is necessary to build a common methodological framework, which can be based on the identification of tangible modified monetary flows (healthcare expenditure, production, public costs) or on the monetary valuation of intangible items (life, well-being, time).
- In France, studies suggest valuing a life at over 3 million euros and a year of healthy life at over 130,000 euros, based on a meta-analysis by the OECD¹, the Quinet Commission² and a recent study by France Stratégie³.
- In view of the method used, Asterès considers that these values reflect a declarative propensity to pay and bear no relation to the monetary benefits actually generated.

Objectives

To inform public decision-makers, this study proposes a method to quantify the health and economic effects of various innovations (organizational, therapeutic, digital, public policies) in health care at a societal level.

Methods

- Six innovations were selected to represent the diversity of health advancements: the HPV vaccination campaign, lung cancer (LC) screening, early administration of highly effective therapies (HET) against multiple sclerosis (MS), continuous glucose monitoring (CGM), low emission zones (LEZ), and the "Vivons en forme" (VIF) program.
- The health effects are estimated in terms of cases and deaths avoided. A counterfactual scenario is constructed in which these innovations had been deployed early enough to reach their full potential in 2021.
- The economic impact is evaluated based on the cost of deploying the health action and an estimation of the tangible costs avoided: private and public healthcare expenses, production losses, and public disability costs.

Table 1. Data and sources used for cost-benefits analysis

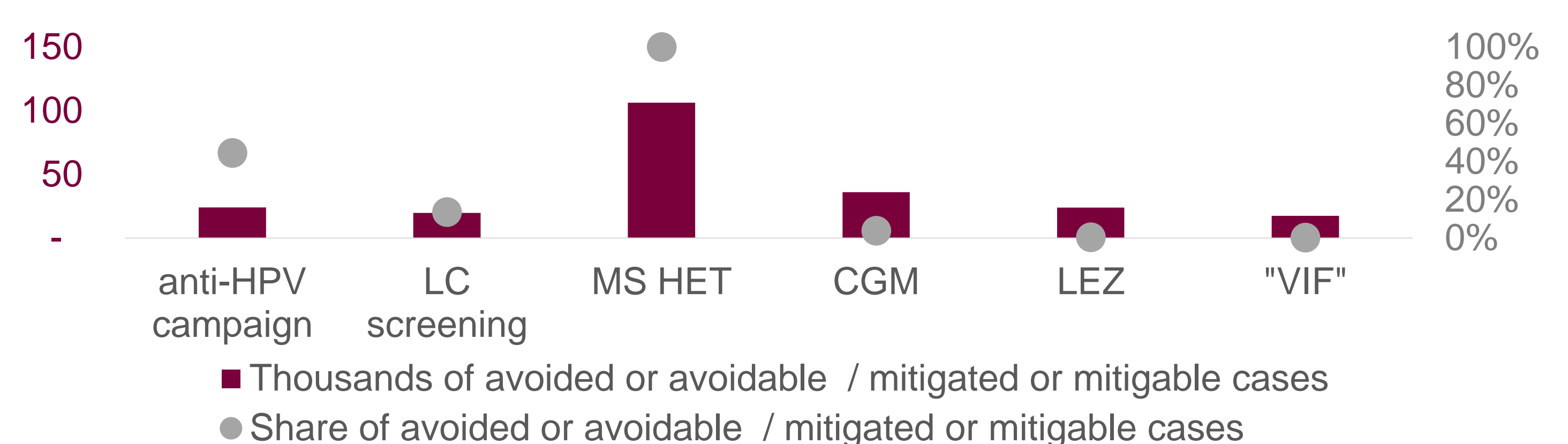
Innovation	Sources and data
Anti-HPV vaccination campaign	Current deployment is 41% and comes from the National Academy of Medicine. The target is set at 90%. Cost of deployment is estimated at 138 M€ per year, based on Rousseau <i>et al.</i> ⁴ . Avoidable outcomes are cancers attributable to HPV estimated by Marant-Micallef <i>et al.</i> ⁵ Average cost of these cancers is 11 610€ per patient per year, including cancer screening costs, according to French health insurance (Assurance Maladie) data and the Information Systems Medicalization Program (PMSI).
LC screening	Current deployment is 0% and the target is fixed by Asterès at 80% of active or past smokers who have been weaned off for less than 15 years to more than 30 pack-years, between 55 and 74 years old. Cost of deployment is 180 M€ per year, according to Gendarme <i>et al.</i> ⁶ Avoidable outcomes is late detection of lung cancer. Cost of lung cancer ranges from 15 724€ for stage I cancer to 21 395€ for last stage, according to French health insurance data and stages ratio in Buja <i>et al.</i> ⁷ Death cost is 14 340€ on average.
Early administration of HET against MS	Current deployment is zero and target fixed at 101 200 patients – total number of MS patients in France. Cost of deployment is estimated at 921 M€ based on market prices, net of substituted treatments. Avoidable outcome is negative evolution of the disease. Cost ranges from 16 750€ per patient year for EDSS 1-2 to 76 300€ for EDSS 7-9, according to Bouleau <i>et al.</i> ⁸
CGM	Current deployment is estimated at 72% based on IQVIA data and the target is fixed at 100%. Based on market prices, cost of deployment is estimated at 496 M€, net of substituted devices. Avoidable outcome is diabete complications, which costs on average 23 910€ per patient per year based on French health insurance data and PMSI.
LEZ	Current deployment is 11 LEZ and no higher objective was set. Cost of deployment includes green subsidies and is estimated at 40 M€ in the transition period. In the long-run, cost tends to zero. Avoidable outcomes are diseases caused by pollution. Cost of these diseases is estimated at 1 400€ per patient per year on average. Death cost is 7 570€ on average.
« VIF » Program	Current deployment is 238 985 beneficiaries, and no higher objective was set. Cost of deployment is estimated at 1,5 M€ based on public information available on the program. Avoidable outcome is obesity during adulthood, which costs 1 240€ per patient per year on average, according to Moukala Same <i>et al.</i> ⁹

Results

Health

These innovations would have allowed France in 2021 to avoid up to 130,000 cases of severe or chronic illnesses and save 12,000 lives, representing 2% of the cases attributable to the considered pathologies and 2% of all deaths.

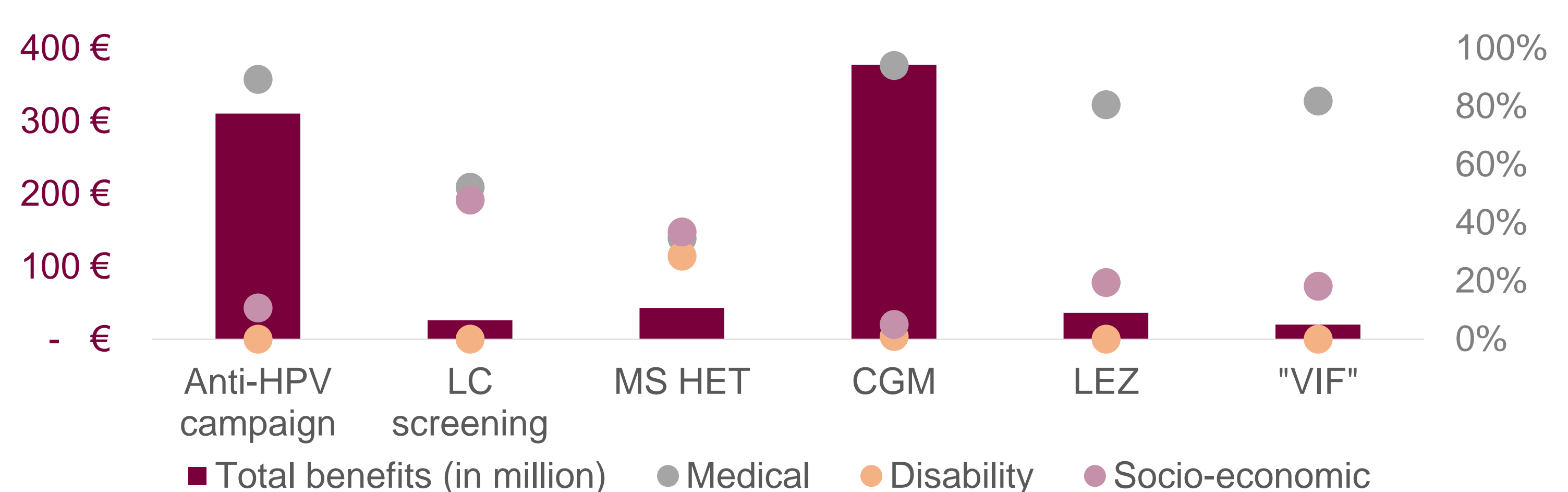
Figure 1. Health effects of innovation in thousands of cases (left axis) and percentage of cases (right axis).



Economic

- The net cost-benefit is positive to the tune of €800 million per year. On average, €1 spent by Health Insurance would generate €6.7 in tangible monetary gains for society. For each life saved, the health expenditure is €11,000, and for each pathology or aggravation avoided, it is €570.
- These amounts are significantly lower than the monetary equivalents used for the socioeconomic estimation of health effects of public investments, which in France are over €3 million per life and €130,000 per DALY.
- In detail, CGM generates €377 million per year for society, the expansion of HPV vaccination has a net positive impact amounting to €310 million per year, early generalization of HET for MS would yield a net gain of €43 million per year, LEZ would bring in €36 million per year once the transition period is over (during which the measure incurs a net cost of €4 million per year), LC screening would result in a net gain of €25 million per year, and the VIF program would generate €20 million per year.

Figure 2. Effects of each innovation in terms of cost savings (left axis) and breakdown by source (right axis).



Conclusions

It is possible to compare the prospective and tangible health and economic effects of various innovations. The tangible impact thus complements the decision-making process by providing an alternative to the monetization of intangible variables.

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Disclosures

Guillaume Moukala Same and Charles-Antoine Schwerer from Asterès were commissioned by Innovation 100T to conduct this study.