Budget Impact Analysis of the EPOCA Telemonitoring System for Elderly Patients in France

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INTRODUCTION

France's aging population faces high rates of chronic illness, multimorbidity, and avoidable hospitalizations, placing pressure on an already strained healthcare system. Nearly 40% of elderly individuals (age 80+) in France are hospitalized annually, with an average inpatient stay of about 25 days per patient; strikingly, over 30% of these hospitalizations are estimated to be avoidable, with similar proportions for emergency department visits.

Remote monitoring systems (RMS) have shown promise in improving care coordination and reducing acute care use.

OBJECTIVE

This study aims to assess the cost-effectiveness of the Vigie-Age framework including the EPOCA RMS compared to standard care, focusing on reductions in hospitalizations, emergency visits, and overall healthcare costs.

METHOD

Cost-utility model using data from the Vigie-Age Article 51 pilot study (722 participants, including 408 with long-term follow-up, Table 1).

- Time Horizon: 10 years.
- Model: Markov model with daily cycles simulating transitions across health states (at home, emergency department visits, hospitalization, death) (Figure 1).
- Perspectives: Analyses conducted from French National Health Insurance (NHI) and collective perspectives.
- Costs: Included direct medical costs (hospital, outpatient, and intervention expenses [€4,441 per year per patient]) (Table 1).
- Health Outcomes: Measured in quality-adjusted life years (QALYs).
- Sensitivity Analyzes: Deterministic and probabilistic approaches used to assess model robustness.

RESULTS

- **EPOCA reduced ED visits** by 54% and **hospitalizations** by 46%, cutting average hospital stay from 55.6 to 30.6 days (Figure 2).
- Total costs per patient were €29,200 with **EPOCA** vs. €39,900 for SOC, a **€10,700 saving** from the **societal perspective**, and a **€7,400** saving from the **NHI perspective**. EPOCA yielded **0.04 additional QALYs** and remained cost-saving even at higher program costs (Figure 3).
- Sensitivity analyses confirmed the robustness of results (Figure 4). EPOCA had a **90% probability** of being **dominant** and a **95% probability** of being **cost-effective** at a €30,000/QALY threshold.

Figure 1. Markov model structure

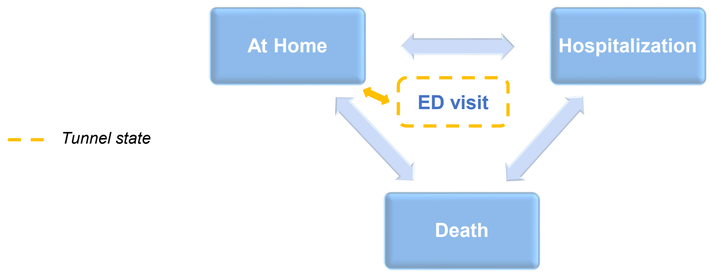


Table 1. Model Parameters

	EPOCA RMS	SOC
Inclusion during ED visit (%)	22.0	22.0
Monthly Hospitalization rate (%)	1.3	1.9
Monthly ED visit rate (%)	1.6	3.5
Probability of hospitalization after ED visit (%)	69.0	71.0
Hospitalization costs* (€, payer**)	2,924	2,971
ED visit costs (€, payer/collective)	52/166	52/166
Annual outpatient costs (€, payer***)	5,820	5,337
Hospital disutility (per hospitalization****)	-0.0095	-0,0100

** A different cost of 4,249 was used for hospitalization following inclusion through ED, ** Collective costs were assumed to be 1.27 higher: *** Collective and payer costs were assumed identical as most patients are under 100% coverage by the NHI; **** based on -0.0013 on 7.3/7.7 hospitalization days on average for EPOCA/SOC.*

Figure 2. Impact of EPOCA on the number of ED visit, hospitalization and hospitalization days

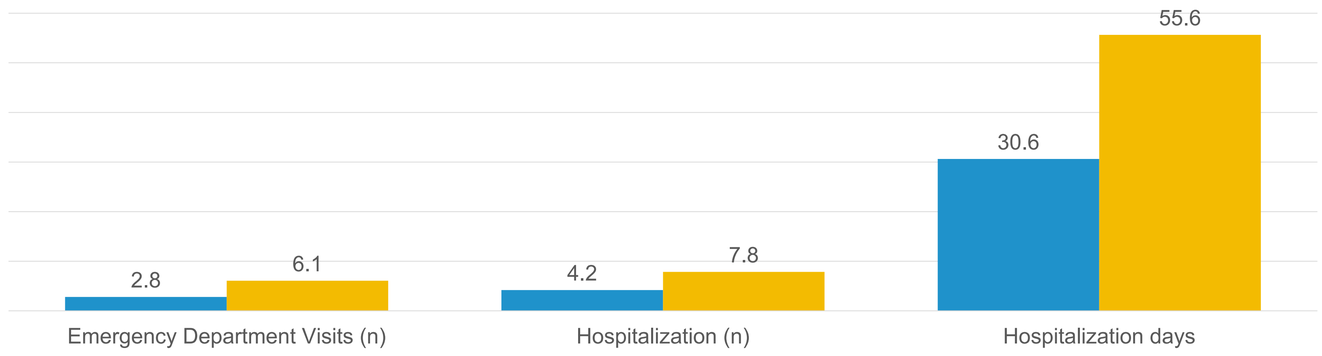


Figure 3. Total Costs over the time horizon for EPOCA vs SOC in the collective and NHI perspective

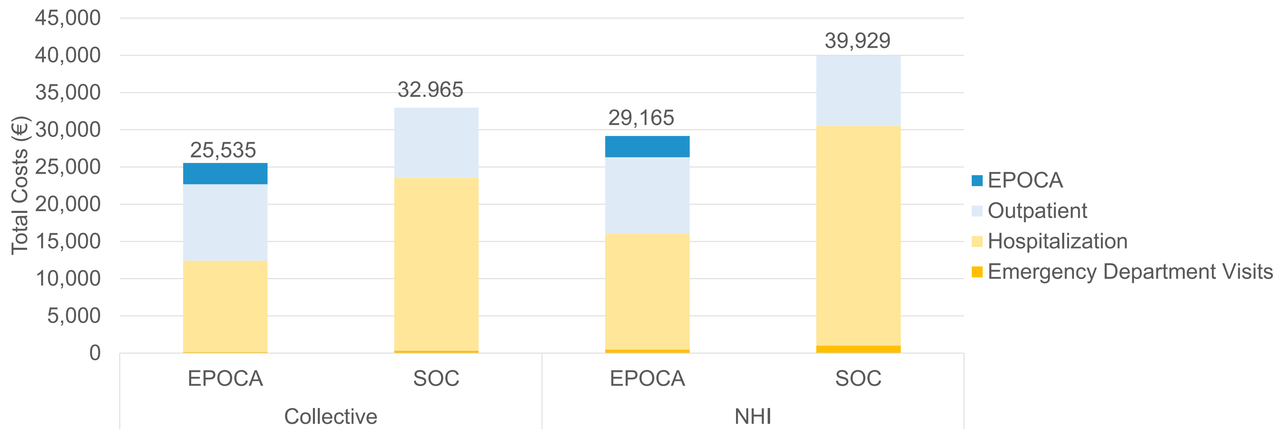
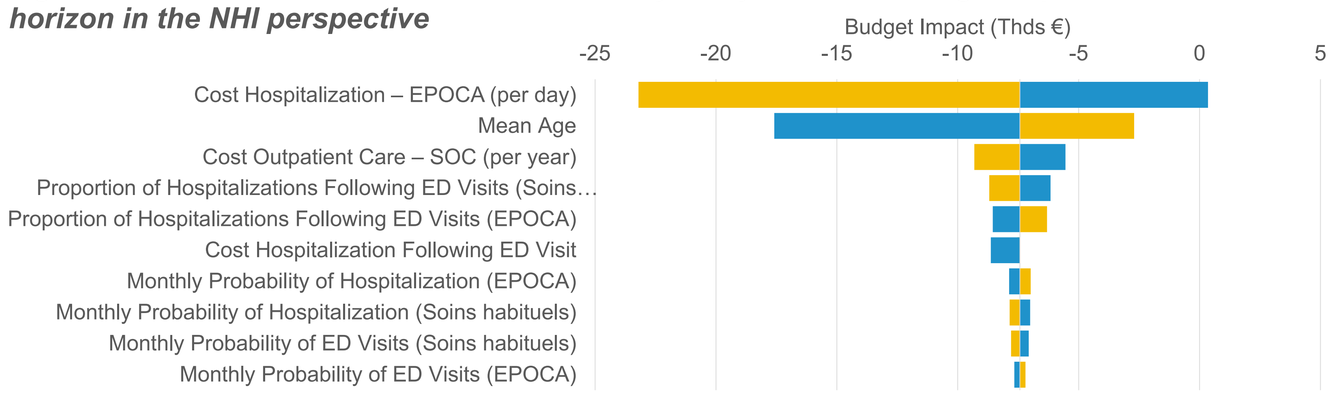


Figure 4. Results of the deterministic sensitivity analysis for the budget impact over the time horizon in the NHI perspective



CONCLUSIONS

EPOCA is a **cost-effective strategy** for elderly patients at high risk of hospitalization. It not only **reduces acute care utilization** but also **improves quality-adjusted life expectancy** and **lowers total healthcare costs.**

From both perspectives, the **budget impact is favorable**, leading to savings and a **dominant position** versus the standard of care.

Supported by real-world implementation data and consistent with international best practices, EPOCA has strong potential for national scale-up. RMS for France's elderly care could enhance care quality, reduce hospital pressure, and better address the needs of a rapidly aging population.

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