

Mobile Diagnostic Services for Stationary Care in Germany: An Economic Evaluation Model for the DIKOM Project (01NVF21101)

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OBJECTIVES

Nursing home residents are frequently hospitalized for the evaluation of health issues such as infections, falls, or cardiovascular disorders. Due to the frailty and multimorbidity of this population, hospital stays are often associated with adverse outcomes, including delirium, further falls, pressure ulcers, and depression. Improved access to timely diagnostics and medical care within nursing homes could reduce such admissions and alleviate pressure on hospital emergency departments. The DIKOM project introduces a Mobile Geriatric Unit (MGU) — a vehicle equipped with diagnostic tools including CT, X-ray, ECG, EEG, ultrasound, and laboratory facilities — to provide specialist-led diagnostics directly at the nursing home. This approach is expected to enable in-place treatment and improve care continuity.

We conduct a simulation study before the trial results are available to assess the projects impact on uncertainty estimates.

Our assessment assists to identify the most valueable estimates to collect while conducting the DIKOM trial.

- Mobile Diagnostic for Nursing Home Residents
- Simulation before Trial



METHODS

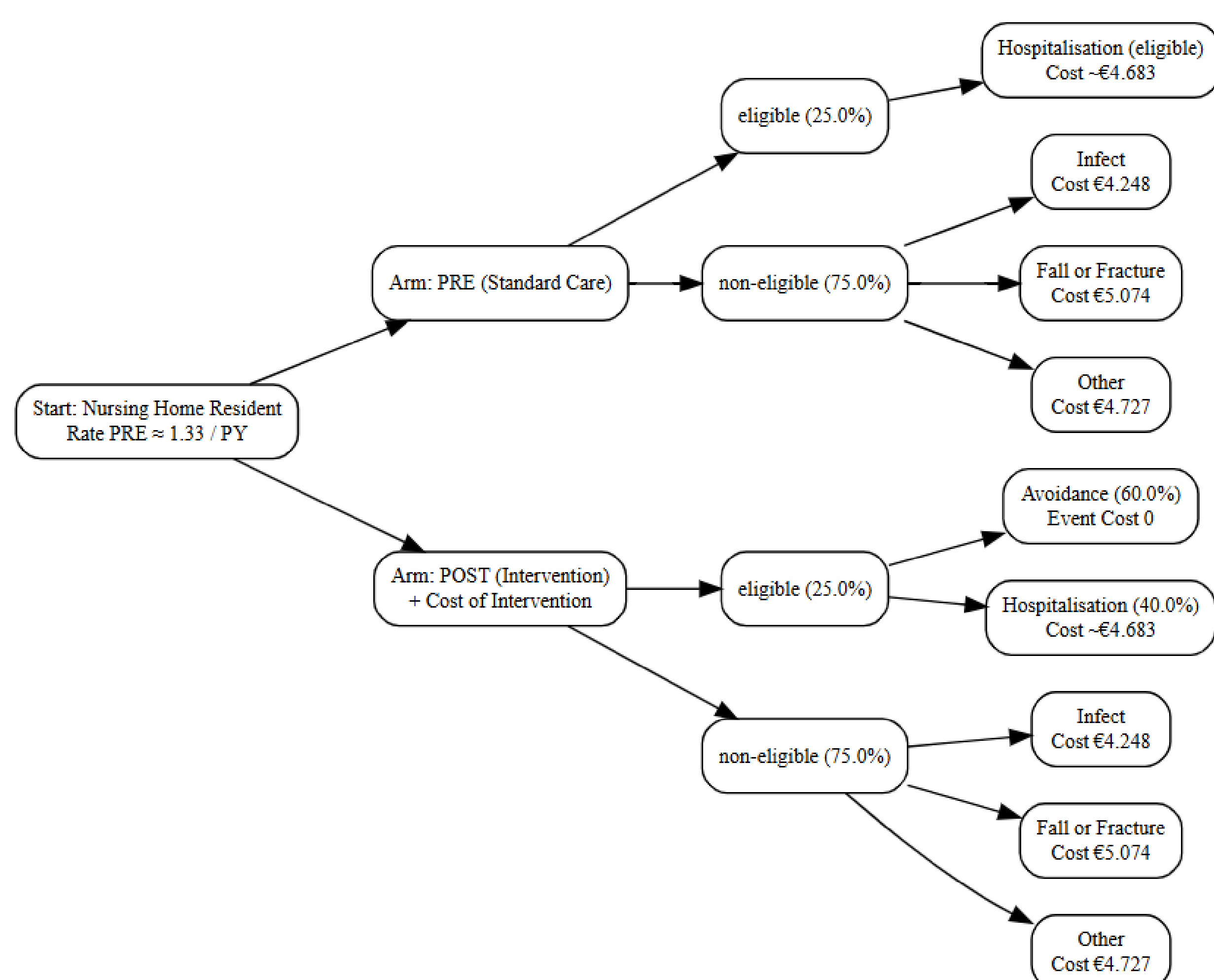
A decision analytical model was developed to assess the cost-effectiveness of the MGU intervention in the context of a cluster-randomized controlled trial. The model integrates trial design parameters, epidemiological data, and cost estimates from the literature to simulate multiple implementation scenarios.

This modeling approach follows the principles of value-of-information (VOI) analysis to inform and prioritize data collection.

- Decision-Analytical-Model
- Value-of-Information



SIMULATION MODEL

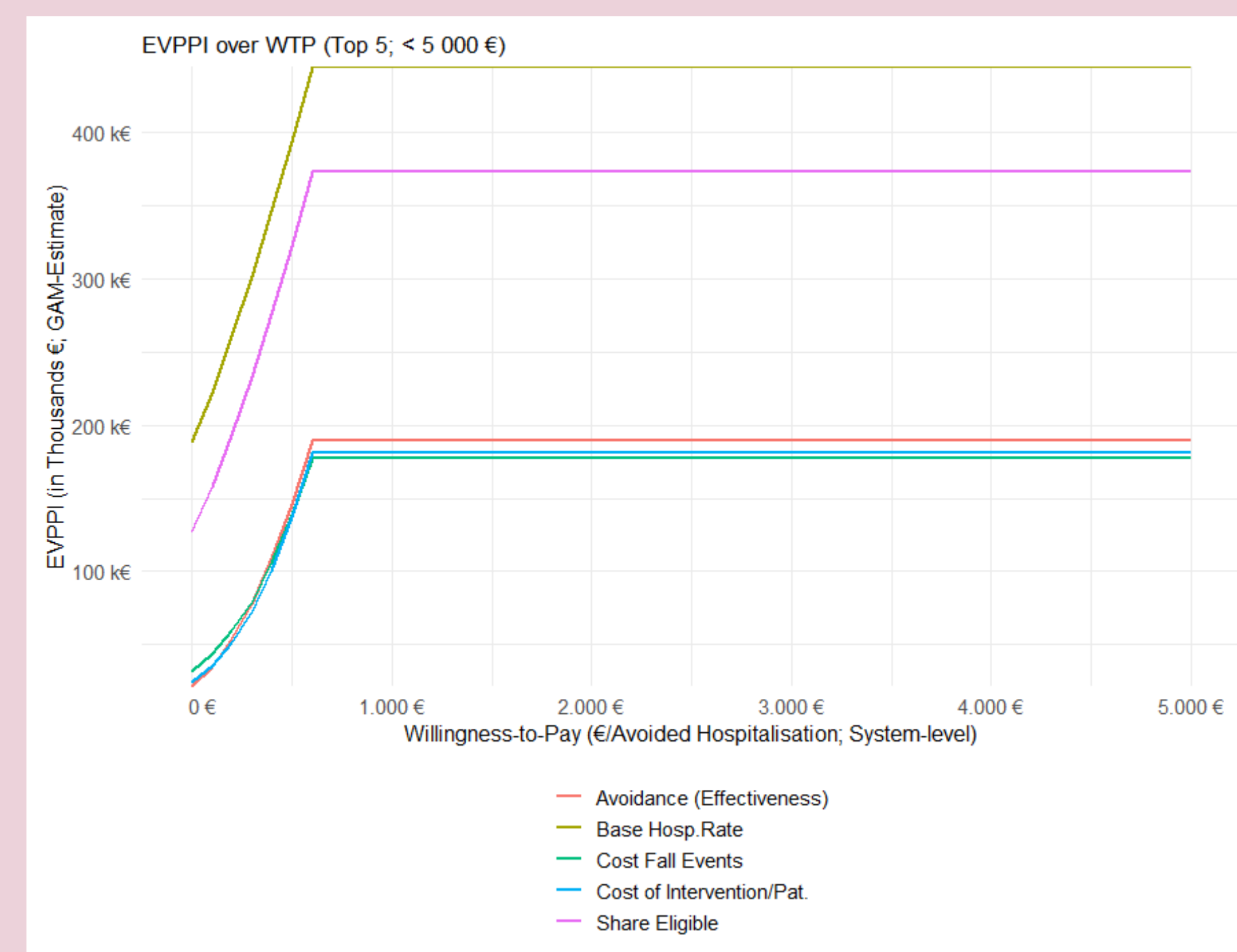
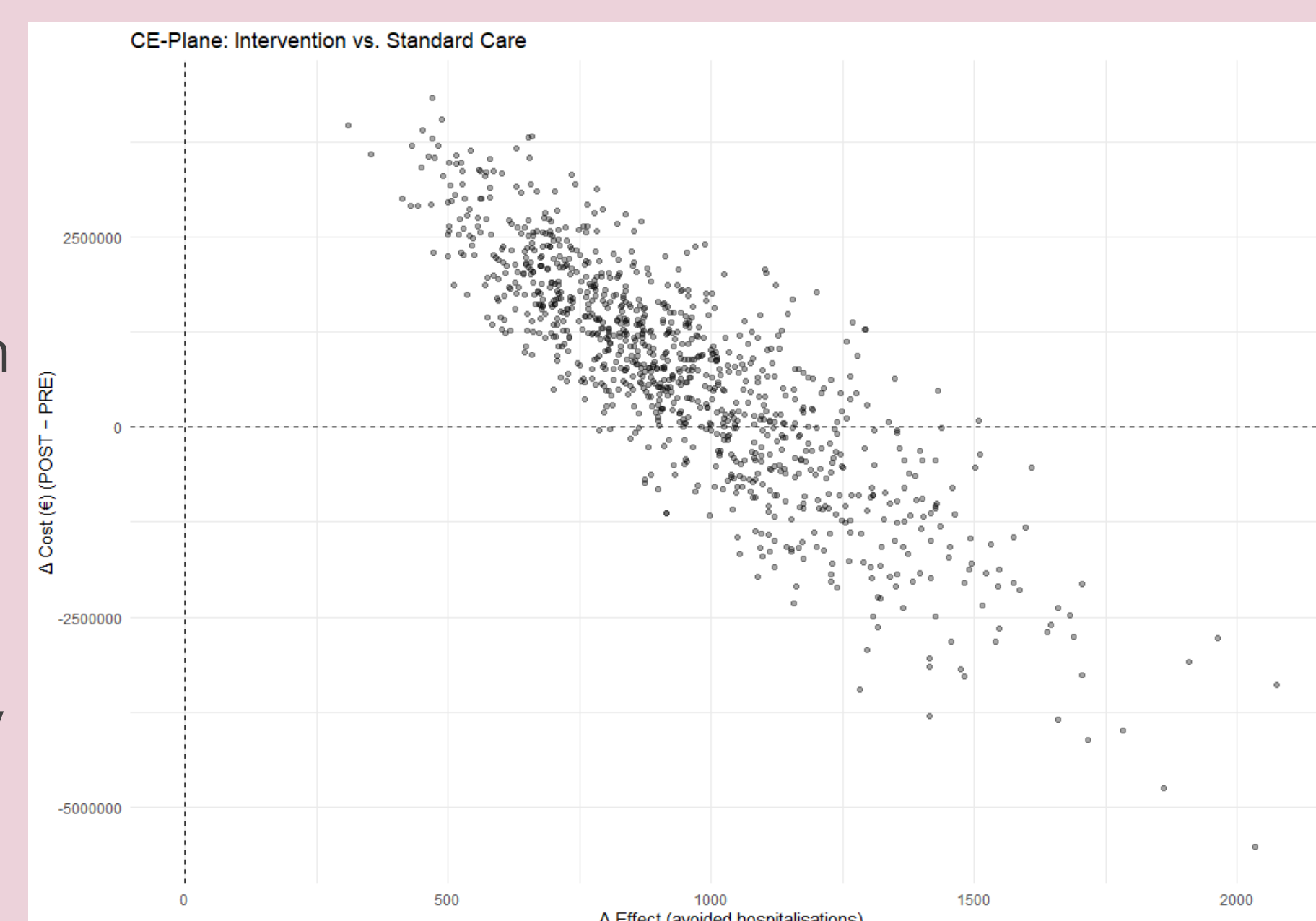


The core decision model is a simple decision tree. The main intervention effect derives from the avoidance of unnecessary hospitalization in cases where nursing home residents are sent to hospital to receive laboratory testing or imaging diagnostics.

SIMULATION APPROACH

Simulation results suggest that reductions in hospital admissions and associated complications are key drivers of the MGU's cost-effectiveness. The analysis identifies critical parameters—such as the prevalence of avoidable admissions, the base hospitalization rate, and the effectiveness of the MGU — that have the greatest influence on the expected outcomes. These insights inform the most valuable outcome measures for the trial and highlight where empirical uncertainty most strongly affects the intervention's value proposition.

Our results indicate that even at low WTP thresholds the value of information derived from reducing parameter uncertainty is substantial on system-level. Due to the high economic burden of hospitalizations in resident homes, the potential benefits gained from interventions succeeding in reducing the share of avoidable hospitalizations. Our results further highlight the importance of focusing research efforts on the aspects where uncertainty is high and the net health impact is expected to be high.



CONCLUSIONS

This study demonstrates the value of simulation-based modeling to guide the evaluation of complex health service interventions. In the case of DIKOM, early economic modeling helps to clarify the potential impact

- Simulation should accompany trials
- Not all uncertainty is equal. Some is more important than others.

of a Mobile Geriatric Unit on care quality and resource use in nursing homes. It also supports decision-making by identifying the most policy-relevant outcomes.

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