Early Health Technology Assessment and Cost-Effectiveness of the National Cardiovascular Disease Prevention Program in Greece

HTA118

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INTRODUCTION

- Cardiovascular disease (CVD) remains the leading cause of mortality in Greece, accounting for approximately 40% of annual deaths and an estimated economic burden of €4.3 billion (Figure 1).[1,2,3]
- In response, the PROLAMVANO National Cardiovascular Disease Prevention Programme (NCVPP) was launched by the Hellenic Ministry of Health, targeting 5.5 million adults aged 30-70 years without known CVD. The programme is the largest prevention initiative **ever implemented in Greece** and has been **recognised within the EU as a best practice** for its scale, integration, and alignment with public health priorities.
- Effective prevention through **early detection, risk factor management, and treatment optimisation** is essential to reduce cardiovascular mortality and the associated healthcare and societal burden in Greece and across Europe. [3]

OBJECTIVE

- To conduct an early health technology assessment (HTA) of the National Cardiovascular Disease Prevention Programme (NCVPP) to evaluate its clinical outcomes, cost implications, and cost-effectiveness, thereby supporting evidence-based policy decisions on its implementation, optimisation, and potential scale-up or extension across Greece.

METHOD

- A **Discrete Event Simulation** (DES) model was developed in SIMUL8 (SIMUL8 Corporation, Boston, MA, USA), following ISPOR–SMDM Good Modeling Practices.[4]
- This analysis represents the **second use case of the newly developed DES framework** for evaluating the clinical and economic impact of NPP/CG revisions (abstract *MSR3*).
- **The model simulated the implementation of the NCVPP / PROLAMVANO over five years (2024–2029)** from the EOPYY payer perspective. It captured transitions across four CVD risk categories and modeled screening, LLT initiation and uptitration, monitoring, and management of major cardiovascular events.

Program and Baseline Assumptions

- Target population: ~5.5 million adults (30–70 years) without known CVD.
- Program budget: €100.6 million (MoH).
- Based on EMENO study, ~4.5 million Greeks have dyslipidemia, yet only 2–3 million received LLTs in the past year.[5]
- Baseline distribution and risk transition were informed by ATTICA and EMENO studies.[5,6]

Model

- 5-year time horizon (2024-2029)
- Perspective: third-party payer (EOPYY)

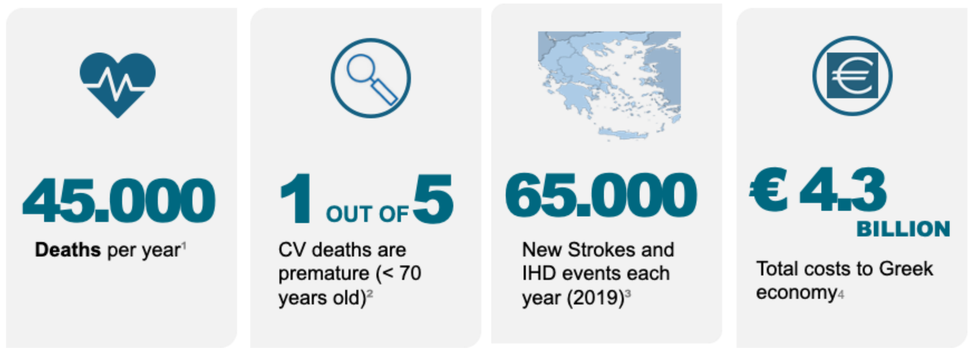

Figure 1. The burden of cardiovascular diseases in Greece

- Model structure, assumptions, and transition probabilities were validated by clinical experts and other stakeholders for relevance and alignment with the PROLAMVANO program.

Scenario Design

- A conservative scenario assumed: 40% reduction in undiagnosed dyslipidemia and 20% increase in adequately treated high- and very high-risk patients.
- No change in low-risk patients.
- Untreated and undertreated patients were expected to decline by ~20%, corresponding to proportional increases in treatment per the revised NPP.
- Effects on smoking cessation and blood pressure control were not modeled.

Data Inputs and Outputs

- Data sources: *ATTICA*, *EMENO*, *MoH DRGs*, 2024 medicine bulletins.
- Effectiveness: *CTTC* meta-analyses and major LLT RCTs.[7-11]
- Outputs: major CVD events prevented, incremental cost, and ICER per event avoided.

RESULTS

- Under these conservative assumptions, the NCVPP is projected to prevent 13,700 major CVD events, 10,100 non-fatal and 3,600 fatal (Figure 2) over a 5-year period (2024-2029).

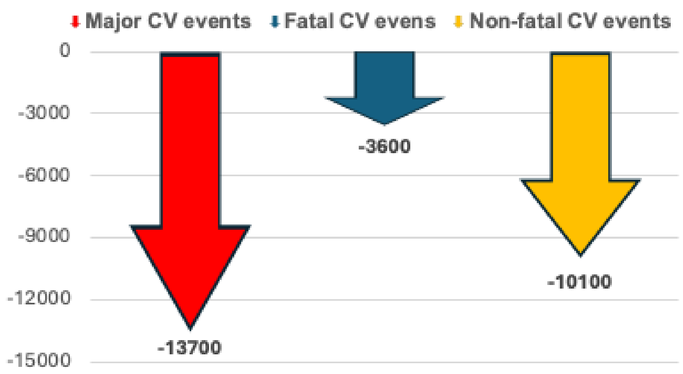

Figure 2. Projected 5-year clinical impact of NCVPP / PROLAMVANO under conservative assumptions

- The incremental program cost is €144 million, driven by expanded screening and treatment uptake, partially offset by reductions in CVD event-related costs (Table 1).

	Without NCVPP	NCVPP	Difference
NCVPP / Prolamvano Budget	0	100,626,000	**100,626,000**
Medicines	777,176,225	818,626,510	**41,450,285**
Clin/Lab Follow-up	1,838,632,090	1,866,690,806	**28,058,716**
CV events/ Admissions	848,933,100	822,784,200	**-26,148,900**
TOTAL (€)	**3,464,741,415**	**3,608,727,516**	**143,986,101**

Table 1. The 5-year economic impact of the NCVPP

- The incremental cost-effectiveness ratio (ICER) was €10,510 per major CVD event avoided, well below typical willingness-to-pay thresholds (Table 2).
- The analysis did not consider the potential impact of smoking cessation, better control of blood pressure or better management of the low and moderate-risk population.

	Without NCVPP	NCVPP	Difference	ICER
Cost	3.464.741.415	3.608.727.516	**143.986.101**	
Major CV events (stroke, myocardial infarction or CV death)	527.100	513.400	**-13.700**	**-10.510**

Table 2. Cost-effectiveness analysis of the NCVPP

CONCLUSIONS

- The **NCVPP/PROLAMVANO appears highly cost-effective under conservative assumptions**, confirming its potential to deliver significant health and economic benefits to the Greek population.
- The model deliberately excluded effects related to smoking cessation, improved blood pressure control, and interventions in moderate- and low-risk populations. Therefore, **the actual real-world impact of the program is likely to be even greater than projected.**
- **Future iterations** of the DES model will **incorporate real-world outcomes (RWD), quality-adjusted life years (QALYs), and additional preventive interventions**, allowing for a more comprehensive assessment of the program's full potential, scalability, and transferability.
- **The DES framework provides a robust foundation for early HTA of large-scale public health initiatives**, offering decision-makers evidence-based insights on effectiveness, efficiency, and resource allocation.
- **Sustained collaboration between the Ministry of Health and all stakeholders**, including patients, academy, industry and the private sector will be critical **to maximize the long-term benefits of PROLAMVANO - the largest prevention program ever implemented in Greece, and one of the most ambitious in Europe.**

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FUNDING

This study was sponsored by ELPEN Pharmaceutical S.A., Athens, Greece. The sponsor had no influence on study design, model development, or interpretation of results.

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