# Population-Level Impact Assessment of the Revised Dyslipidemia Prescription Protocol in Greece Using Simulation Modelling

HSD89

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## INTRODUCTION

- Dyslipidemia (DSL) affects about 50% of Greek adults and remains a significant, modifiable risk factor for cardiovascular disease (CVD), the leading cause of death in Greece and across Europe.[1,2]
- Despite the widespread availability and use of LLTs, real-world evidence indicates that treatment intensity is often inadequate and LDL-C targets are frequently not met.[3,4]
- To improve these inefficiencies, the National Prescription Protocol (NPP) for dyslipidemia was updated in 2024 to ensure consistency with current ESC/EAS and Hellenic Atherosclerosis Society clinical guidelines (CG).
- Evaluating the potential clinical and economic impacts of this policy change necessitates a quantitative, adaptable approach. Discrete-Event Simulation (DES) allows decision-makers to explore different strategies in a virtual setting, evaluating their impact on outcomes and costs prior to real-world application.[5,6]

## OBJECTIVE

- To assess the 5-year clinical and economic impact of the recently revised NPP for dyslipidemia using a discrete-event simulation (DES) model.
- To support the efforts of the scientific community and healthcare decision-makers in improving dyslipidemia management and promoting a more efficient allocation of limited healthcare resources.

## METHOD

- This study applied a DES approach and represents the first use case of a newly developed framework designed to assess the clinical and economic impact of NPP/CG revisions (presented separately in this congress as abstract MSR3).
- The starting point was the revised 2024 NPP for dyslipidemia, reflecting contemporary clinical practice in Greece.
- The DES model was developed in SIMUL8 software (SIMUL8 Corporation, Boston, MA, USA).

**Model structure**

- The conceptual model (Figure 1) simulates the Greek adult population across four cardiovascular (CV) risk categories (low, moderate, high, very high) and six treatment states (including untreated). Each simulated patient may transition between risk or treatment categories, experience a major CV event (CVE), or die from CV or non-CV causes (Figure 2).

**Transition probabilities and data sources**

- Epidemiological, clinical, and cost inputs were derived from national studies, including ATTICA study, real-world registries, randomized controlled trials (RCTs), and official statistics, including ELSTAT, EOPYY, and the Hellenic Atherosclerosis Society.[7-12]
- Relative risk reductions were drawn from the Cholesterol Treatment Trialists' Collaboration (CTTC) and major LLT trials.

**Validation and alignment**

- Model assumptions were reviewed and confirmed by clinical experts and other stakeholders to ensure consistency with the NPP/CG. Internal calibration and face validation were performed by KOLs in this field. Model structure, assumptions, and results were iteratively refined based on expert feedback, and final outputs were presented to stakeholders for review and dissemination.

**Analytical framework**

- The analysis was conducted from the third-party payer perspective (EOPYY) over a 5-year time horizon without discounting, consistent with short-term policy evaluation practice. Outcomes included major cardiovascular events (CVEs), CV mortality, and direct medical costs.
- Model design followed the ISPOR-SMDM Good Modeling Practices and the STRESS reporting guidelines, ensuring transparency, traceability, and reproducibility of results.[13-14]

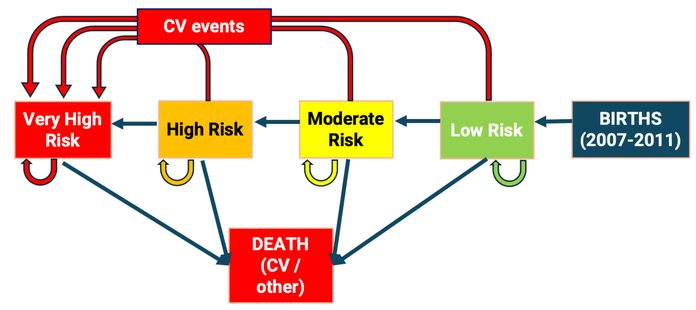


*Figure 1. Conceptual model of adult population flow across cardiovascular risk categories*

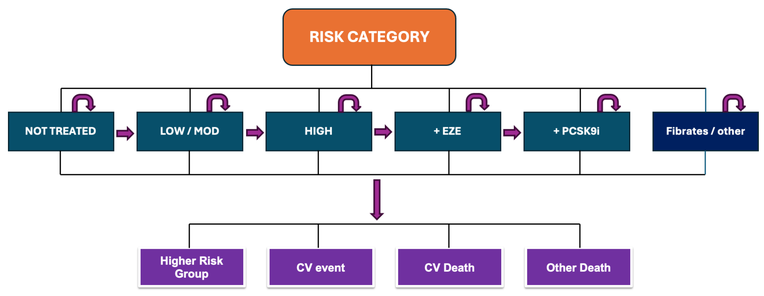


*Figure 2. Simulating of dyslipidemia management pathways and cardiovascular events by risk group*

## RESULTS

- Over a 5-year period (2024–2029), and assuming no significant changes in dyslipidemia management approaches, the percentage of adults in Greece diagnosed and on LLT is expected to exceed 39% of the total population (Figure 3).

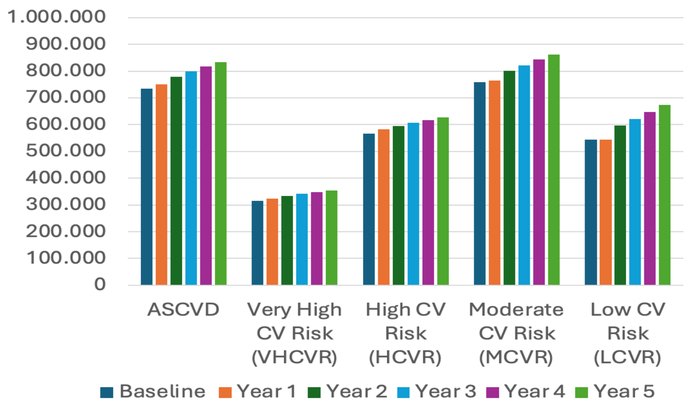


*Figure 3. Rising LLT use in all cardiovascular risk groups*

- Despite the growing use of LLTs, residual cardiovascular risk remains substantial. An estimated 527,100 major cardiovascular events are likely to occur nationwide, with 63% concentrated among high- and very-high-risk groups (Figure 4).

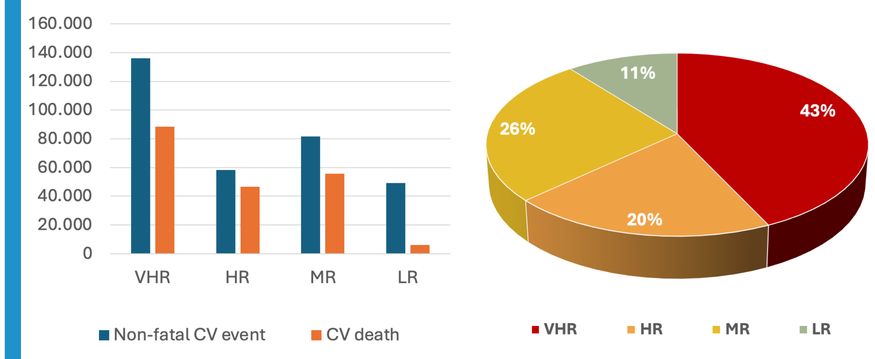


*Figure 4. Projected number of major cardiovascular events by risk group (2025-2029)*

- The cumulative 5-year economic burden related to the diagnosis and treatment of dyslipidemia and its cardiovascular complications is forecast to surpass €3 billion, of which only 22% relates to pharmaceutical expenditure (Figure 5).

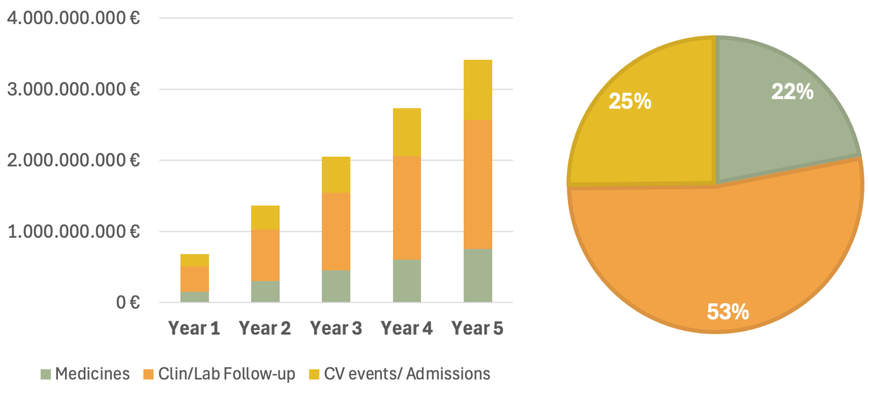


*Figure 5. The cumulative 5-year economic burden of dyslipidaemia*

## CONCLUSIONS

- This study represents the **first practical application of the newly developed DES framework for assessing the impact of NPP/CG revisions.** It confirms **technical feasibility** and **robust multi-level validation**, covering design, conceptual modelling, transition probabilities, and outcomes, in accordance with ISPOR-SMDM guidelines for model **transparency and credibility**.
- Model results show a **progressive increase in treated patients**, aligning with risk stratification principles: the higher the estimated cardiovascular risk, the greater the likelihood of treatment. Over a 5-year period, **the proportion of adults receiving LLTs is projected to exceed one-third of the Greek population.**
- Despite wider treatment coverage and enhanced therapeutic intensity, **approximately 527,100 major cardiovascular events are expected to occur in Greece by 2029** - nearly half among very-high-risk patients (15% of the population), highlighting the persistent unmet need for efficient and comprehensive prevention strategies.
- Overall, **the DES framework provides a validated, transparent, and adaptable tool to support evidence-based policy decisions** in cardiovascular prevention and resource allocation.

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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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