

# Budget Impact Analysis of Cenobamate for Epilepsy Patients with Drug-Resistant Focal Onset Seizures in the Netherlands

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## INTRODUCTION & OBJECTIVES

Epilepsy is one of the **most** prevalent chronic and severe neurological conditions, focal onset seizures (FOS) constitute the **most** common seizure type, representing up to 61% of the epilepsy population<sup>1</sup>.

**120 thousand** people has epilepsy  
**6 thousand** people are diagnosed per year



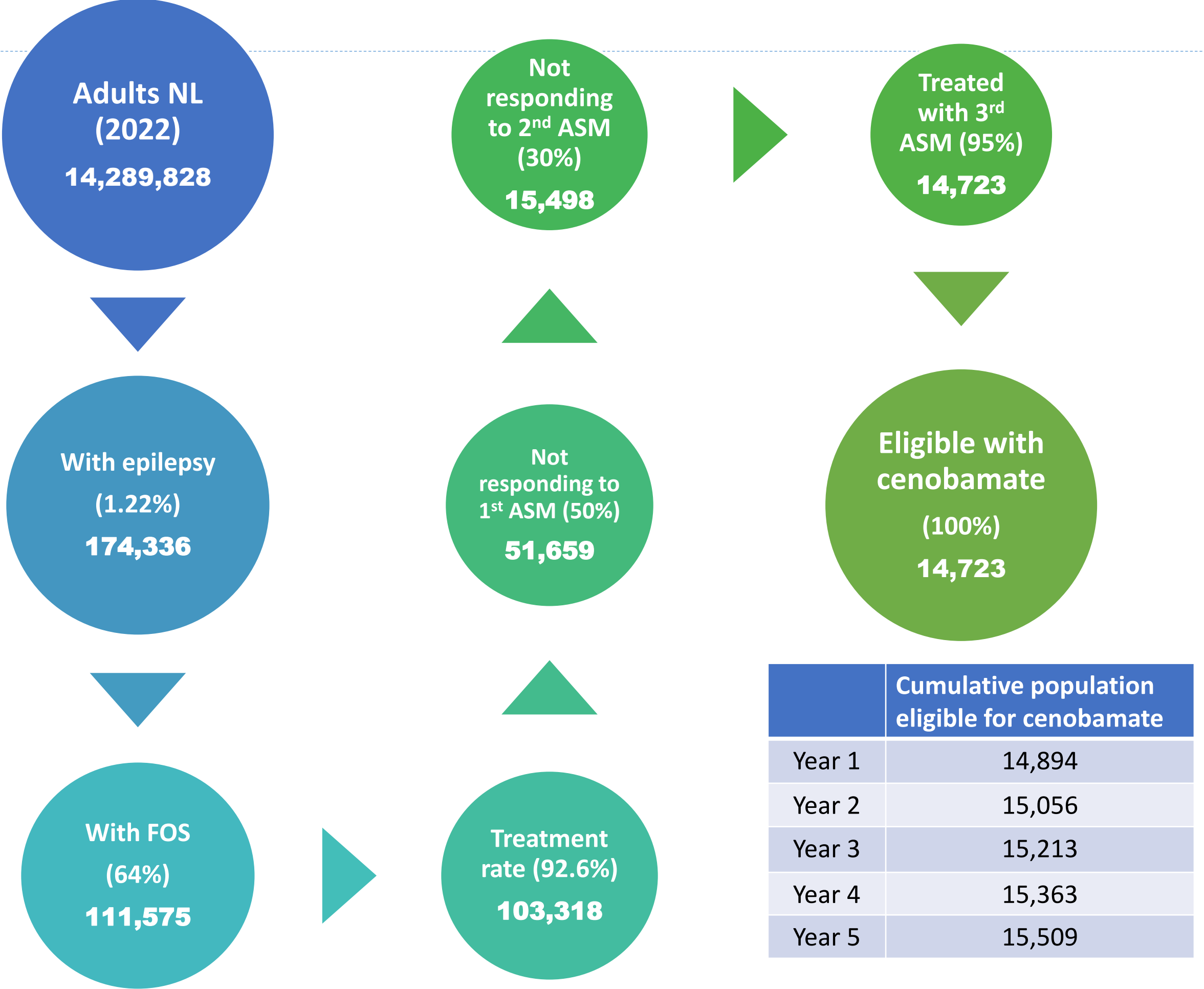
Several anti-seizure medications (ASM) have been developed for epilepsy treatment, however, **40%** of patients with epilepsy are **drug-resistant**<sup>2</sup>. The 3<sup>rd</sup> generation drugs were therefore launched.

Cenobamate as a **novel therapy** was approved by the EMA in 2021 as **adjunctive treatment** of FOS with/without secondary generalization in adult epilepsy patients inadequately controlled despite a history of treatment with  $\geq 2$  ASMs.

The clinical efficacy of cenobamate is well reported. The objective of this study was to explore the **financial consequences** of adopting cenobamate as a treatment alternative from a societal perspective in the Netherlands.

## METHODS

A **prevalence-based budget impact model**<sup>3</sup> was adapted to the Dutch setting with a **5-year** time horizon.



	Cumulative population eligible for cenobamate
Year 1	14,894
Year 2	15,056
Year 3	15,213
Year 4	15,363
Year 5	15,509

The model accounts for the eligible population, **real-world** market shares (from Kempenhaeghe & Maastricht UMC+), treatment effectiveness and resource use in two scenarios: cenobamate with **constant** market share versus cenobamate with **linearly increased** market share up to 20%.

Scenario 1: Constant market share of cenobamate							
Year	Current allocation of management treatments for epileptic patients with FOS						
	Cenobamate	Perampanel	Brivaracetam	Lacosamide	Resection	VNS	DBS
Year 0	6.63%	8.71%	37.31%	41.38%	2.37%	3.55%	0.05%
Year 1	6.63%	8.71%	37.31%	41.38%	2.37%	3.55%	0.05%
Year 2	6.63%	8.71%	37.31%	41.38%	2.37%	3.55%	0.05%
Year 3	6.63%	8.71%	37.31%	41.38%	2.37%	3.55%	0.05%
Year 4	6.63%	8.71%	37.31%	41.38%	2.37%	3.55%	0.05%
Year 5	6.63%	8.71%	37.31%	41.38%	2.37%	3.55%	0.05%
Scenario 2: Linear increase in market share of cenobamate							
Year	Proposed allocation of management treatments for epileptic patients with FOS						
	Cenobamate	Perampanel	Brivaracetam	Lacosamide	Resection	VNS	DBS
Year 0	6.63%	8.71%	37.31%	41.38%	2.37%	3.55%	0.05%
Year 1	9.30%	8.45%	36.17%	40.12%	2.37%	3.55%	0.05%
Year 2	11.98%	8.18%	35.03%	38.85%	2.37%	3.55%	0.05%
Year 3	14.65%	7.91%	33.89%	37.58%	2.37%	3.55%	0.05%
Year 4	17.33%	7.65%	32.74%	36.32%	2.37%	3.55%	0.05%
Year 5	20.00%	7.38%	31.60%	35.05%	2.37%	3.55%	0.05%

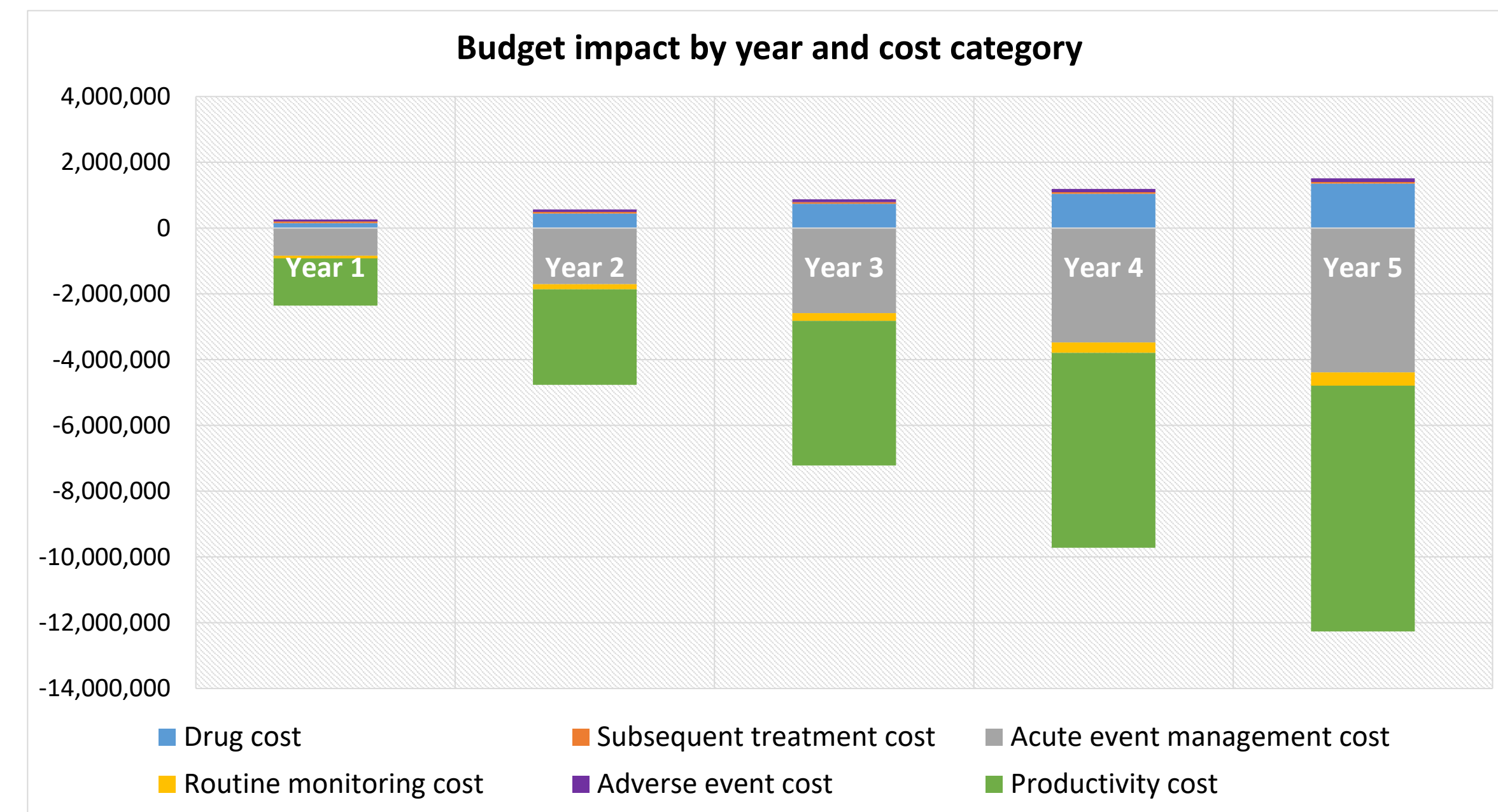
Clinical inputs, such as treatment response, seizure reduction, and adverse events, were obtained from clinical trials. Costs for drugs, medical, and non-medical expenses were sourced from national databases, MUMC+, and literature.

Drug	Medical	Non-medical
<ul style="list-style-type: none"><li>Cenobamate</li><li>Perampanel</li><li>Brivaracetam</li><li>Lacosamide</li></ul>	<ul style="list-style-type: none"><li>Subsequent treatment</li><li>Monitoring</li><li>Seizure events</li><li>Adverse events</li></ul>	<ul style="list-style-type: none"><li>Productivity loss</li></ul>

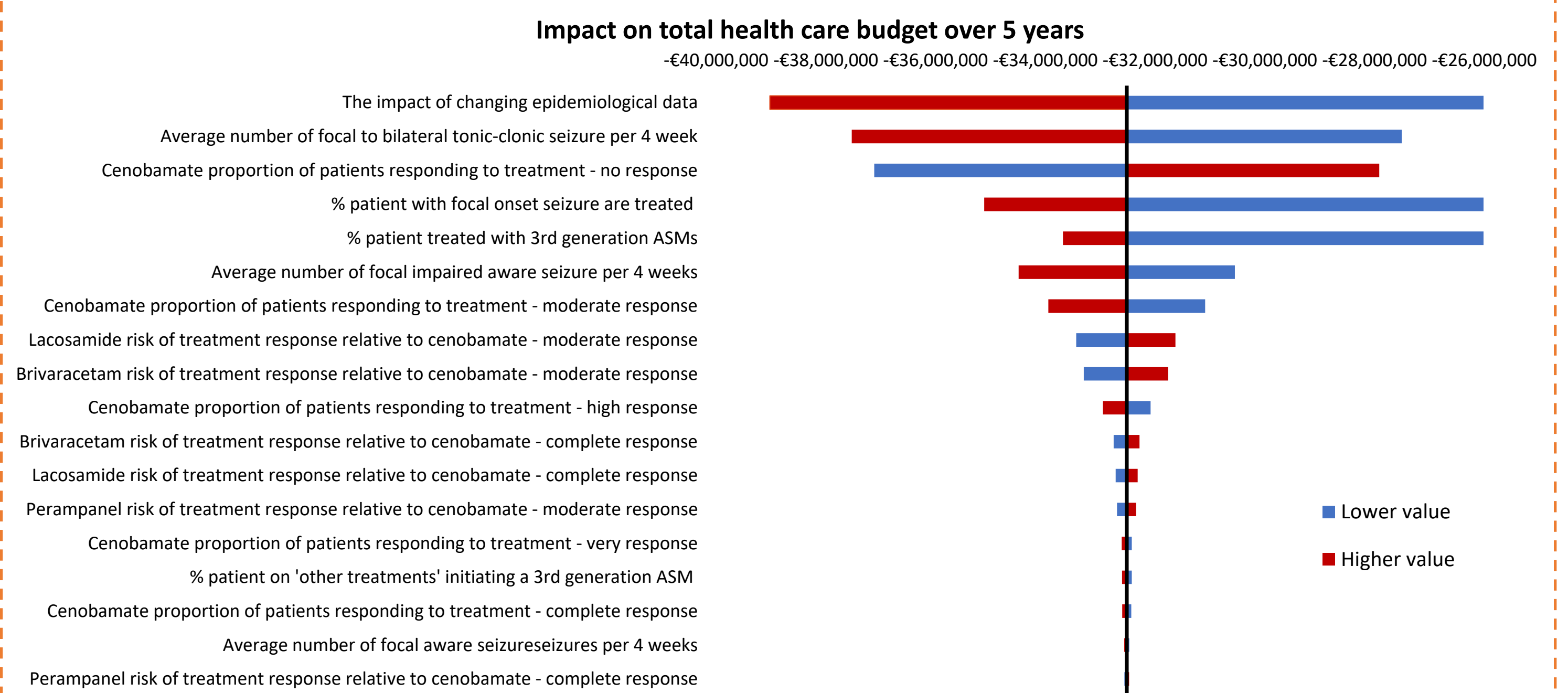
## RESULTS

Category	Year 1	Year 2	Year 3	Year 4	Year 5	Total 5 years
Cenobamate cost	€ 733,039	€ 1,617,608	€ 2,520,196	€ 3,439,818	€ 4,375,646	€ 12,686,307
Incremental drug cost	€ 151,697	€ 442,206	€ 738,784	€ 1,041,085	€ 1,348,824	€ 3,722,596
Subsequent treatment cost	€ 47,261	€ 48,748	€ 50,182	€ 51,574	€ 52,931	€ 250,697
Event management cost	-€ 843,257	-€ 1,704,945	-€ 2,583,956	-€ 3,479,358	-€ 4,390,374	-€ 13,001,890
Routine monitoring cost	-€ 76,754	-€ 155,185	-€ 235,193	-€ 316,693	-€ 399,614	-€ 1,183,439
Adverse event cost	€ 65,741	€ 76,238	€ 86,882	€ 97,671	€ 108,603	€ 435,135
Productivity cost	-€ 1,436,185	-€ 2,903,762	-€ 4,400,842	-€ 5,925,838	-€ 7,477,427	-€ 22,144,054
TOTAL cost	-€ 2,214,206	-€ 4,196,701	-€ 6,344,143	-€ 8,531,558	-€ 10,757,058	-€ 31,920,955

- Although cenobamate adds a gross budget impact of €12,686,30, the displacement of other drugs yields a total impact on the drug budget of €3,722,596 over 5 years;
- Adopting cenobamate resulted in a medical cost savings of €13,499,498 due to less resource use. Non-medical cost savings of €22,144,054 was associated with reductions in productivity due to focal epilepsy;
- Overall, savings generated at medical and non-medical cost level offset the gross drug budget impact of cenobamate, resulting in a saving of €31,920,955 over 5 years.



The budget saving caused by the increase in market share of cenobamate was increasing overtime. Productivity and seizure event management costs are the top two contributors to the overall budget saving.



The one-way sensitivity analysis confirms the robustness of our results.

## CONCLUSION

Treatment with cenobamate is associated with both medical and non-medical cost savings, which offset the increase in drug budget and result in a significant potential budget saving of €32 million over 5 years in the Netherlands.

### Limitation

- Not feasible to retrospectively obtain some resource use data, relevant estimations were based on Dutch expert opinion
- We conservatively assumed four neurologist visits per year for non-responders and two for responders, and additional three visits for treatment-related adverse event management
- Complex scenarios such as stopping and switching treatment, and the costs of pre-surgical evaluation were not taken into account
- The long-term efficacy and safety of cenobamate and its comparators remains uncertain
- In the real-life setting, most medically refractory patients are on polypharmacy which makes it difficult to start cenobamate, and also some patients suffer far more comorbidities and are treated with multiple medications, all of these factors could interact with the safety and side effects of cenobamate which in our study is underestimated

1. Ioannou P, et al. Brain Behav. 2022;12(9):1–11.  
2. Chen Z, et al. JAMA Neurol. 2018;75(3):279–86.  
3. Vonck K, et al. Value in Health [Internet]. 2022;25(12):S151.