

The Economic Impact of Empagliflozin in Adult Patients with Chronic Heart Failure in Spain

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BACKGROUND

- Heart failure (HF) is a clinical syndrome, in most cases chronic, caused by an abnormality which has consequently reduced cardiac output and/or elevated intracardiac pressures¹⁻³.
- Most HF patients endure multimorbidity, such as chronic kidney disease or diabetes, with an average of 7.8 chronic diseases per patient, which is associated with an increase between 45 and 74% in 3-year mortality⁴⁻⁷.
- HF is classified into three phenotypes based on left ventricular ejection fraction (LVEF): preserved (HFpEF; LVEF ≥50%), mildly reduced (HFmrEF; LVEF 41-49%), and reduced (HFrEF; LVEF ≤40%)^{3,8}.
- It is estimated that 1.89% of the adult population in Spain suffers from HF⁹.
- Empagliflozin is the only treatment indicated for adult patients with symptomatic chronic heart failure (CHF), regardless of left ventricular ejection fraction¹⁰.
- The efficacy and safety of empagliflozin, added to optimized standard of care (SoC) therapy, has been demonstrated in two randomized, double-blinded clinical trials: EMPEROR-Reduced in adult patients with symptomatic CHF with reduced LVEF, and EMPEROR-Preserved with LVEF>40%¹¹⁻¹².

OBJECTIVE

To evaluate the direct health costs associated to CHF patients after the introduction of empagliflozin in Spain.

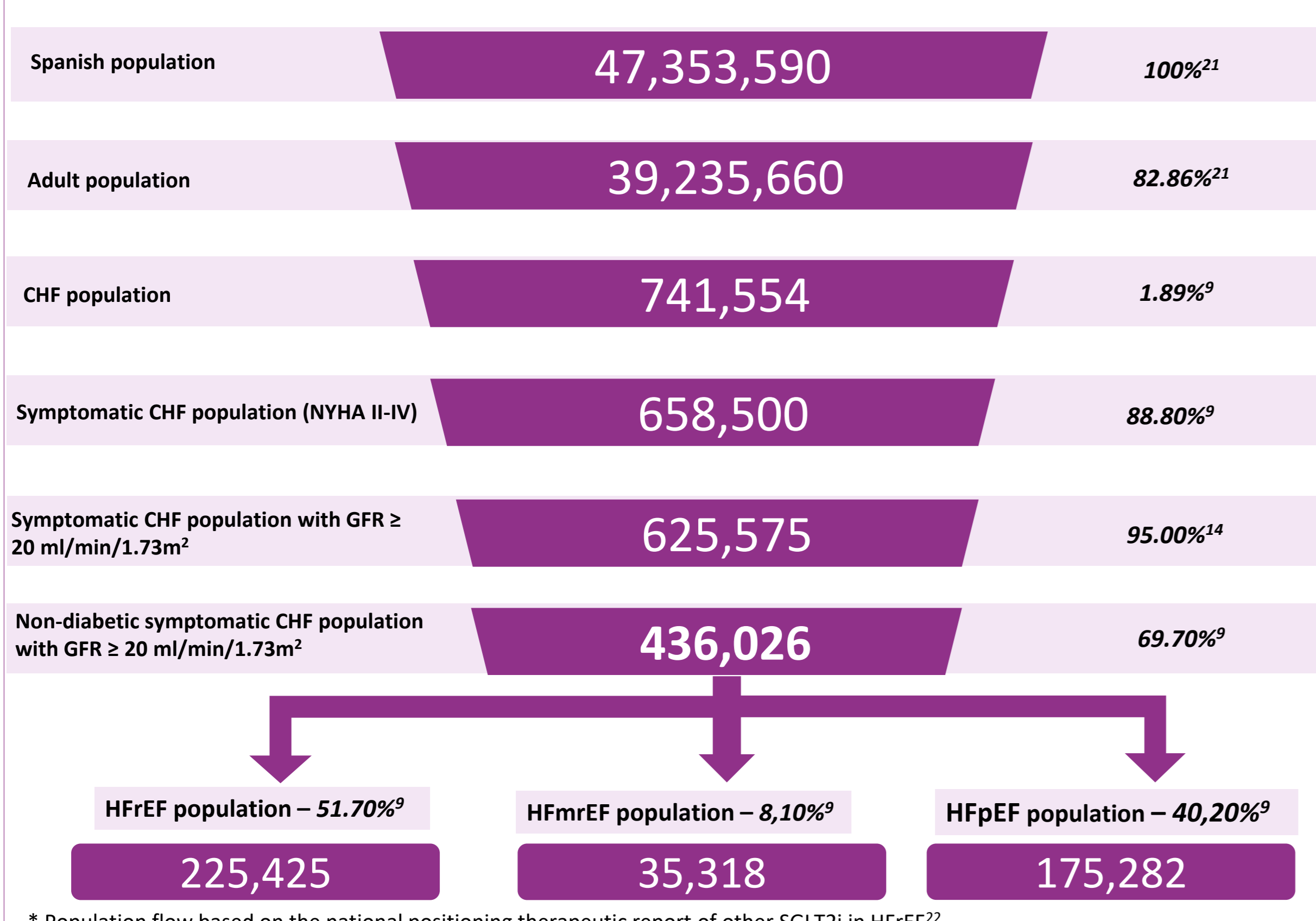
METHODS

- A model was developed to study the management, treatment and its associated costs of adult patients with non-diabetic CHF, between the current scenario and the potential scenario where empagliflozin is introduced.
- The Spanish National Health System (NHS) perspective and a time horizon of three years were considered.
- Clinical events, adverse events and disease management were obtained from the empagliflozin studies and literature¹¹⁻¹⁴. Unit costs were obtained from literature¹⁵⁻¹⁸ and updated to €2022¹⁹. Drug costs were based on manufacture prices after applying the deductions^{15,20}.
- The non-diabetic CHF population and market shares were estimated according to the type of CHF and literature^{9,13,21-22} (Figure 1; Table 1).
- Mortality was reflected on the estimation of patients that begin treatment each year.
- Results were obtained in clinical terms as well as economical terms.
- Sensitivity analysis (SA) were carried out in which the pharmacological cost of empagliflozin was lessened.
- Additionally, two more sub-analysis were taken into consideration: a territorial analysis, where results were displayed for every autonomous community (AC) and a 1,000-patients analysis, in which a hypothetical cohort of 1,000 HF patients was distributed among the three main HF phenotypes

RESULTS

- According to the model, more than 436,000 symptomatic non-diabetic CHF people per year were estimated in Spain (Figure 1).
- Over the 3-year period, more than 3,500 heart failure hospitalizations and more than 700 cardiovascular deaths would be avoided because of empagliflozin plus SoC (Figure 2). On average, in the 3-year period covered, treatment acquisition costs would correspond to 17.3% of the total cost in the current scenario. The introduction of empagliflozin would only increase total treatment acquisition costs by 0.5% (Figure 3).
- In addition, in the base case analysis, empagliflozin would save the Spanish NHS around €2.4 million, €4.6 million and €5.9 million each year, respectively (Figure 4), including additional acquisition cost for empagliflozin.
- In the AC sub-analysis, the introduction of empagliflozin in the Spanish NHS would signify savings for all ACs (Figure 5).
- SAs showed that a reduction of 3%, 5% and 7% of the empagliflozin price would imply an increase in total national savings (TNS) by 10%, 18% and 26%, respectively, in relation to TNS from the base case (Figure 6).
- Considering the 1,000-patients analysis alongside the SA, the introduction of empagliflozin in the Spanish NHS would generate savings between €29,541 and €37,076 (Figure 7).

Figure 1. Spanish population flow (year 1 of the analysis)*



CHF, chronic heart failure; GFR, glomerular filtration rate; HFmrEF, heart failure with mildly reduced ejection fraction; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; NYHA, New York Heart Association functional classification; SGLT2i, sodium-dependent glucose co-transporter 2 inhibitor.

Table 1. Market shares according to the type of chronic heart failure

	Year 1		Year 2		Year 3	
	Current scenario	Potential scenario	Current scenario	Potential scenario	Current scenario	Potential scenario
HFrEF population						
SoC	83.0%	81.9%	77.1%	75.3%	69.5%	67.0%
SoC + S/V	12.9%	9.8%	15.4%	9.9%	20.5%	13.0%
SoC + empagliflozin	0.0%	3.6%	0.0%	6.2%	0.0%	7.7%
SoC + S/V + empagliflozin	0.0%	0.6%	0.0%	1.2%	0.0%	2.3%
SoC + SGLT2i (+/-S/V)*	4.2%	4.2%	7.4%	7.4%	10.0%	10.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
HFmrEF population						
SoC	100.0%	88.0%	100.0%	88.8%	100.0%	90.0%
SoC + empagliflozin	0.0%	12.0%	0.0%	11.2%	0.0%	10.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
HFpEF population						
SoC	100.0%	92.5%	100.0%	86.7%	100.0%	84.5%
SoC + empagliflozin	0.0%	7.5%	0.0%	13.3%	0.0%	15.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The pharmacological treatments distribution within the SoC was based on the EMPEROR-Reduced and EMPEROR-Preserved studies¹¹⁻¹².
* Patients already treated with a sodium-dependent glucose co-transporter 2 inhibitor (SGLT2i) were excluded in the analysis.

CHF, chronic heart failure; HFmrEF, heart failure with mildly reduced ejection fraction; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; SGLT2i, sodium-dependent glucose co-transporter 2 inhibitor; SoC, standard of care; S/V: sacubitril/valsartan.

Figure 2. Estimated clinical events (HHF and CV deaths) over the 3-year period (base case analysis)



Figure 3. Estimated average cost over the 3-year period by type of cost (base case analysis)

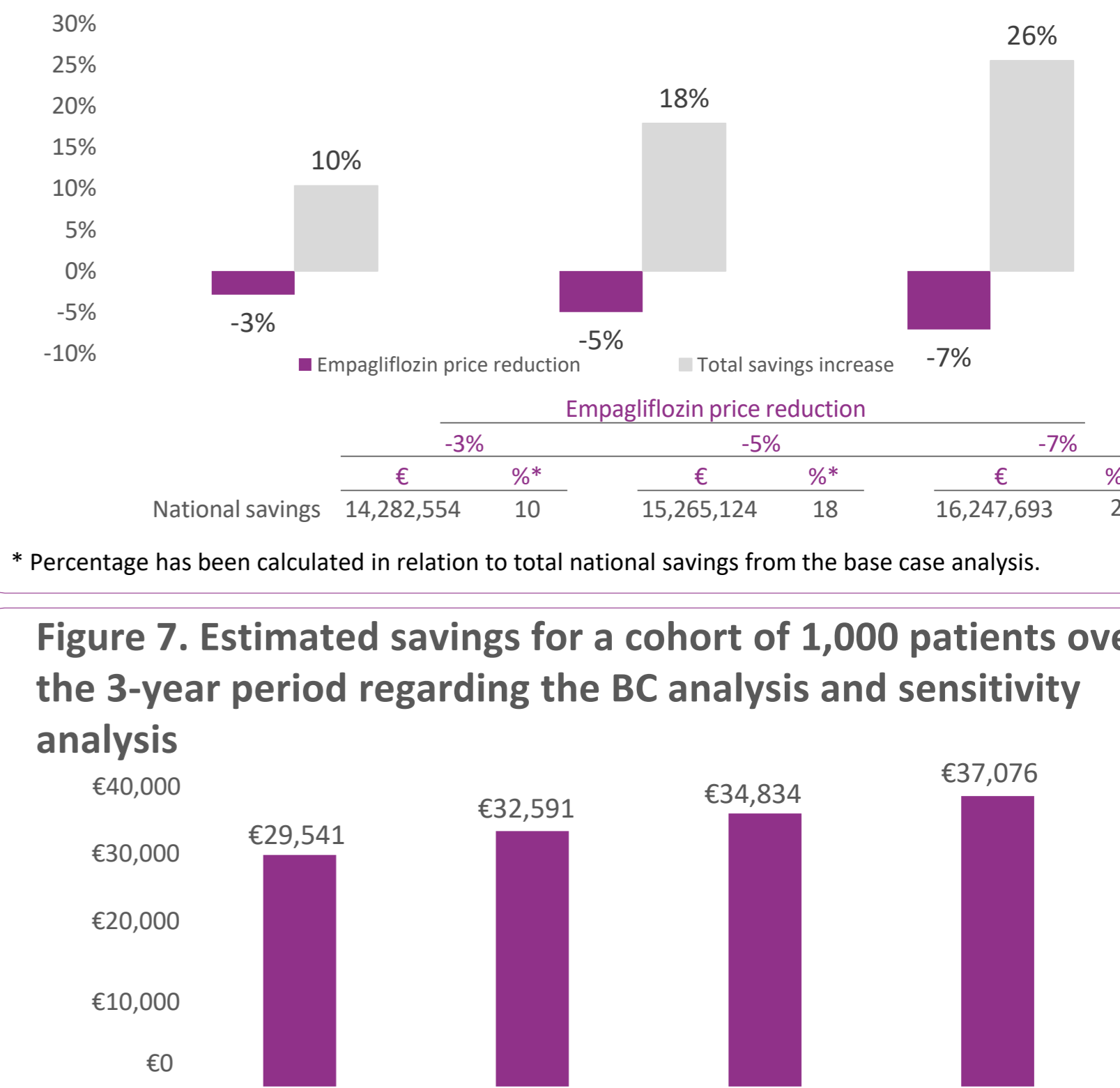


Figure 4. Estimated total costs (€) and savings for every year (base case analysis)

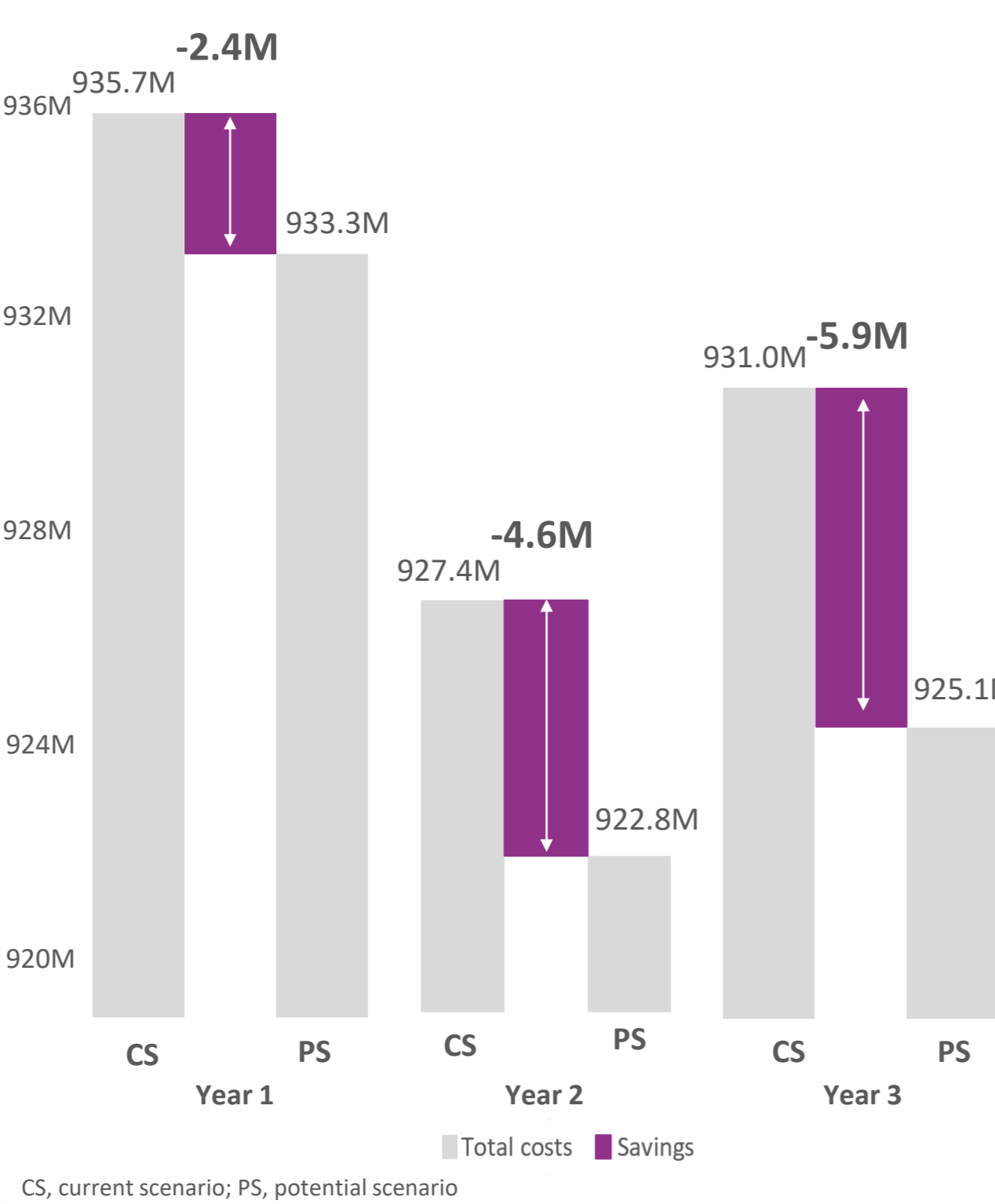


Figure 5. Estimated total savings per autonomous community over the 3 years*

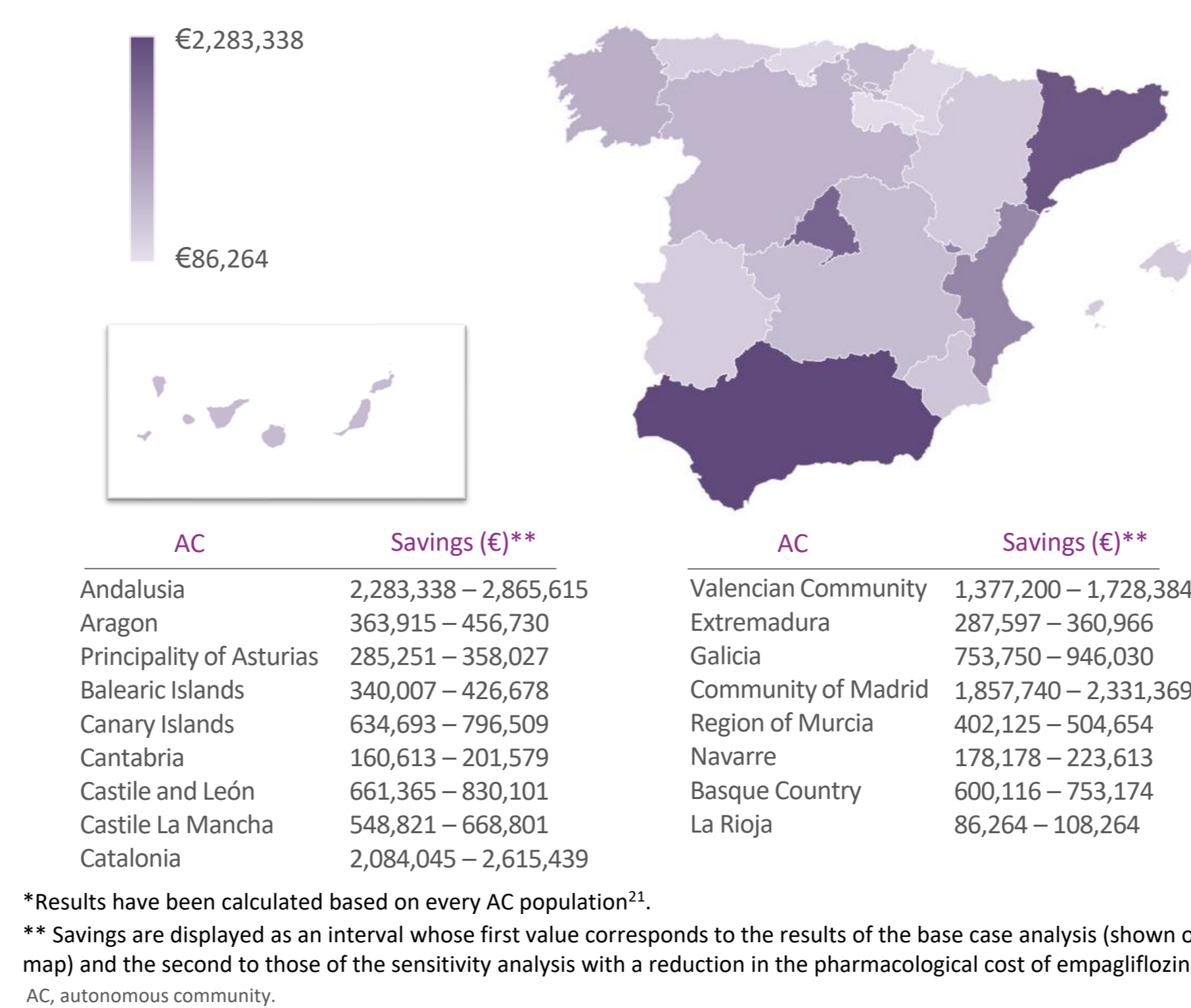
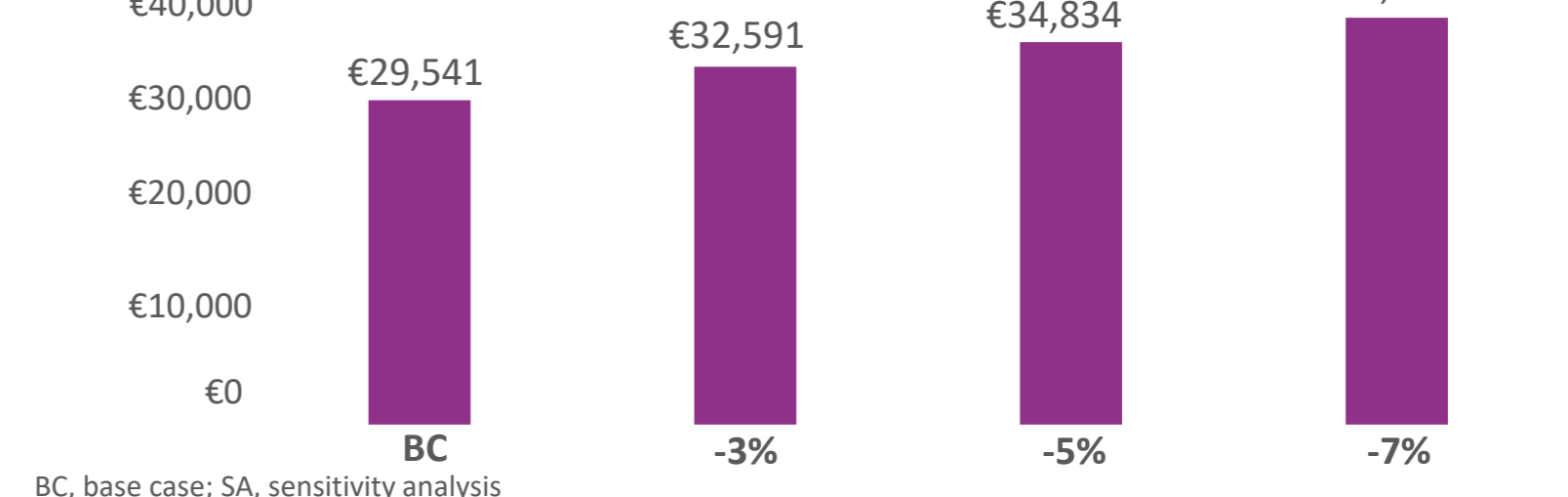


Figure 6. Sensitivity analysis over the 3-year period



Figure 7. Estimated savings for a cohort of 1,000 patients over the 3-year period regarding the BC analysis and sensitivity analysis



CONCLUSIONS

Empagliflozin would result in clinical benefit to adult patients with non-diabetic CHF regardless of the LVEF, providing substantial cost-savings for the Spanish NHS, not only at a national level but also at regional level. In turn, it would mean a reduction of the burden of care.

Acknowledgments

The authors thank IQVIA for the development of the initial models that have been used for this analysis.

Disclosures

The study was supported and funded by BI. The authors meet criteria for authorship as recommended by the International Committee of Medical Journal Editors (ICMJE). Alexandra Solé Angelats is an employee of Boehringer Ingelheim which is the developer of the study. Miquel Sastre Belío and Jaume Costa Samarra are employees of Pharmalex Spain, an independent research entity that received consultancy fees from Boehringer Ingelheim to conduct his research.

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