An Economic Evaluation of Introducing Ferric Carboxymaltose for the Treatment of Iron Deficiency in Patients with Heart Failure from the Perspective of Healthcare Payers in France, Germany, Poland, Spain and Sweden

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INTRODUCTION

- Heart failure (HF) affects 1-2% of the adult population in developed countries[1], with an estimated 15 million people in Europe living with the condition.[2] HF consumes 1-2% of total healthcare budgets through costs of hospitalisations, drugs and interventions.[3]
- Iron deficiency (ID) presents in ~50% of HF patients and increases alongside severity of the condition.[4] ID independently predicts recurrent hospitalisations and mortality, reduces exercise capacity in patients, and generally worsens quality of life (QoL).[3,1,5]
- Ferric carboxymaltose (FCM), a high dose intravenous (IV) iron therapy[6], has proven to be safe and effective in treating ID in the AFFIRM-AHF clinical trial.[7]
- European Society of Cardiology (ESC) 2021 guidelines recommend FCM to treat ID at discharge in patients hospitalised after an episode of acute HF (AHF) with left ventricular ejection fraction (LVEF) <50%.[1]

OBJECTIVES

- This study estimates the cost-effectiveness and budget impact of introducing FCM for the treatment of ID from the perspective of healthcare payers in 5 European countries; France, Germany, Poland, Spain and Sweden.

METHODS

- AFFIRM-AHF clinical trial data informed both the cost-effectiveness and budget impact analyses. Eligible population for each country setting was aligned with the ESC 2021 HF guidelines[1] and the AFFIRM-AHF trial[7] and was determined by a targeted literature review.
- **Cost-effectiveness analysis** utilised a lifetime cohort state-transition Markov model.[8]
- Adaptation of the model to each country setting utilised country-specific life tables to extract cardiovascular death proportions from overall mortality curves and country-specific event costs and adverse events (AEs) costs were also applied.
- No data were identified to inform healthcare resource use stratified by KCCQ-CSS quartile, therefore a country-specific background HF management cost was applied equally across health states.
- FCM acquisition costs were sourced from published literature or supplied by CSL Vifor. SoC was assumed to have no associated costs.
- Country-specific annual discount rates were applied: Germany, Spain, and Sweden, 3%; France, 4% for the first 30 years and 2% thereafter; and Poland, 5% (costs) and 3.5% (benefits).
- **Budget impact analysis** of introducing FCM was estimated across a 5-year time horizon and compared total accumulated costs between a world with FCM treatment versus world without FCM treatment (SoC).
- Country-specific costs were calculated as the aggregate total costs of drug acquisition, hospitalisation events, AEs and cardiovascular deaths over the period.
- Market share growth proportions were implemented to replicate predicted annual uptake of FCM treatment.

RESULTS

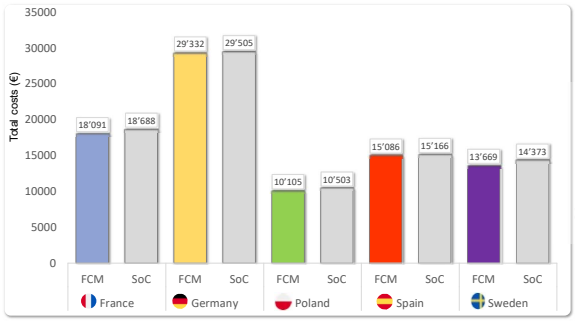
- Across 5 European countries, the estimated total eligible population for FCM treatment was 392,298, accounting for 55% of the total estimated population hospitalised for AHF. (**Table 1**).
- Cost-effectiveness analysis showed that FCM was dominant compared to SoC in all country settings. FCM treatment was associated with a QALY gain and cost savings of 0.430 and €597 in France; 0.444 and €173 in Germany; 0.419 and €485 in Poland; 0.448 and €80 in Spain; and 0.430 and €703 in Sweden (**Figure 1**, **Figure 2** and **Table 2**).
- The net budget impact of introducing FCM versus SoC in France, Germany, Poland, Spain, Sweden resulted in cost savings of €49.767M, €81.319M, €4.49M, €2.011M and €2.347M, respectively (**Figure 3**).

Event	Proportion	France	Germany	Poland	Spain	Sweden	Total
Hospitalised for AHF	100%	130,333	359,415	132,071	81,470	9,115	712,404
With LVEF < 50%	73.13%	95,313	262,840	96,583	59,579	6,666	497,438
With ID	75.30%	98,141	270,640	99,449	61,347	6,863	536,440
Eligible population	55.07%	71,770	197,919	72,727	44,863	5,019	392,298

Table 1. Eligible population calculation for each country

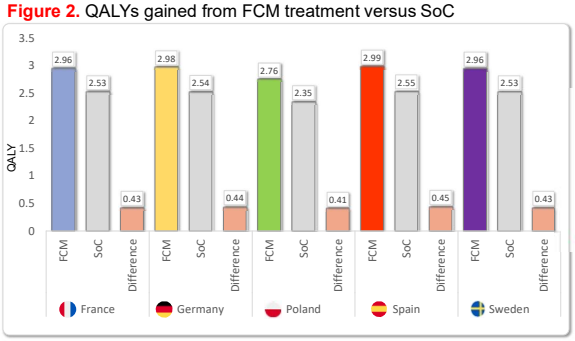
AHF: acute heart failure; LVEF: left ventricular ejection fraction; ID: iron deficiency

Figure 1. Total costs associated with FCM treatment versus SoC



FCM: ferric carboxymaltose; SoC: standard of care

Figure 2. QALYs gained from FCM treatment versus SoC



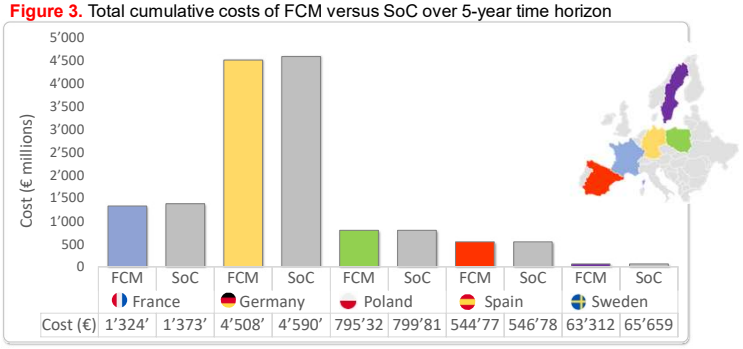
FCM: ferric carboxymaltose; SoC: standard of care; QALY: quality-adjusted life year

	France			Germany			Poland			Spain			Sweden		
	FCM	SoC	Δ	FCM	SoC	Δ	FCM	SoC	Δ	FCM	SoC	Δ	FCM	SoC	Δ
Costs (€)	18,091	18,688	-597	29,332	29,505	-173	10.443	10,928	-485	15,086	15,166	-80	13,669	14,373	-703
LYs	4.238	3.755	0.483	4.266	3.764	0.502	4.165	3.695	0.470	4.284	3.776	0.508	4.235	3.753	0.482
QALYs	2.962	2.531	0.430	2.981	2.537	0.444	2.910	2.491	0.419	2.994	2.545	0.448	2.959	2.530	0.430
ICER (cost/LY gained)	Dominant			Dominant			Dominant			Dominant			Dominant		
ICER (cost/QALY gained)	Dominant			Dominant			Dominant			Dominant			Dominant		

Table 2. Base-case analysis of cost-effectiveness output

FCM: ferric carboxymaltose; ICER: incremental cost-effectiveness ratio; LY: life year; QALY: quality-adjusted life year; SoC: standard of care

Figure 3. Total cumulative costs of FCM versus SoC over 5-year time horizon



FCM: ferric carboxymaltose; SoC: standard of care

CONCLUSIONS

- FCM treatment is projected to be highly cost effective and provide net savings to healthcare budgets, across all 5 European countries.
- This pharmaco-evaluation of FCM highlights the potential cost benefits associated with implementing the ESC 2021 HF guidelines for the treatment of ID at discharge in patients hospitalised after an episode of AHF with LVEF <50%.

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DISCLOSURES. **This study was supported by CSL Vifor**

Acknowledgments. **Medical writing support was provided by HEOR Ltd., funded by CSL Vifor**

Poster presented at ISPOR Europe 2022, 6th-9th November 2022, Vienna, Austria