

Budget Impact Analysis of Including Sacubitril/Valsartan in the National Formulary for the Treatment of Heart Failure with Reduced Ejection Fraction (HFrEF) in Thailand

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OBJECTIVES

This study aimed to estimate the budget impact of introducing sacubitril/valsartan to the national reimbursement for subpopulations of patients with HFrEF from the Thai payer's perspective.

METHODS

Model Overview

- A Microsoft Excel-based budget impact model was developed to project the potential impact of including sacubitril/valsartan in the national drug list for selected HFrEF patient populations with high unmet medical needs over a 5-year time horizon.
- The model compared 2 scenarios which are
 - Reference Scenario: Current situation in which sacubitril/valsartan is not included in the national drug list
 - New Scenario: Sacubitril/valsartan is included in the national drug list for either 1.) patients who remain symptomatic despite treatment with angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB); or 2.) patients with rehospitalization.
- All costs were converted into USD using exchange rate of 1 USD = 31 THB.

Model Inputs

- The model included the following categories of inputs: population and epidemiologic estimates, drug utilization, and direct medical costs comprising of drug acquisition, hospitalization, and mortality costs.
- The treatment effects, which included mortality and hospitalization rates, were derived from the PARADIGM-HF trial¹. The efficacy of ARBs was assumed to be equivalent to ACE inhibitors.
- The numbers of target populations were calculated based on the epidemiological data in Thailand and published literature²⁻⁵.
- The treatment utilization rates were based on market research and analogue analysis of other cardiovascular drugs.
- Sacubitril/valsartan's price expected for national formulary listing was used, and other drug prices were those published by Ministry of Public Health, Thailand⁶. Hospitalization and mortality costs were obtained from published literature⁷⁻⁸.

Sensitivity Analysis

A series of sensitivity analyses was performed to assess the impact on budget when the key model inputs were varied.

RESULTS

- The inclusion of sacubitril/valsartan in the national drug list resulted in 5-year cumulative cost savings of USD 2.96M and 1.46M in patients with symptomatic HFrEF and patients with rehospitalization, respectively (Table 1).
- Comparing with ACE inhibitor/ARB, sacubitril/valsartan yielded 4.9% and 1.4% reductions in the annual probabilities of hospitalization and mortality, respectively, which translated into 1,709 hospitalizations avoided and 488 lives saved in patients with symptomatic HFrEF, and 843 hospitalizations avoided and 241 lives saved in patients with rehospitalization over 5 years (Figure 1).
- The one-way sensitivity and scenario analyses (Figure 2) showed that the acquisition cost of sacubitril/valsartan had the highest impact on the cumulative 5-year budget.
- Other important factors were the proportion of patients who meet the expected reimbursement criteria and the uptake rate of sacubitril/valsartan.

Table 1: Total costs and budget impact in the base case analysis

For patients who remain symptomatic despite guideline-directed medical therapy with ACE inhibitor or ARB

Parameter	Reference Scenario					New Scenario				
	Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5
Annual no. of HFrEF patients who remain symptomatic despite treatment with ACE inhibitor/ARB	35,342	35,150	34,960	34,770	34,581	35,342	35,150	34,960	34,770	34,581
Uptake rate of sacubitril/valsartan	5%	5%	5%	5%	5%	15%	20%	25%	30%	35%
Annual no. of patients treated with sacubitril/valsartan	1,767	1,758	1,748	1,739	1,729	5,303	7,030	8,739	10,432	12,104
Total annual costs (mUSD)	24.42	24.29	24.16	24.03	23.90	27.05	28.21	29.35	30.49	31.60
Net budget impact vs. Reference Scenario (mUSD)	-	-	-	-	-	2.63	3.92	5.19	6.46	7.71
Incremental drug costs per year (mUSD)	-	-	-	-	-	2.93	4.36	5.79	7.20	8.59
Annual budgetary savings from reduction in hospitalization (mUSD)	-	-	-	-	-	-0.10	-0.15	-0.21	-0.26	-0.30
Annual budgetary savings from reduction in mortality (mUSD)	-	-	-	-	-	-0.20	-0.29	-0.39	-0.48	-0.58
Net budget impact per patient per year (USD)	-	-	-	-	-	74.31	111.43	148.56	185.75	222.87

Table 1: Total costs and budget impact in the base case analysis (cont.)

For patients who are hospitalized more than once with HF

Parameter	Reference Scenario					New Scenario				
	Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5
Annual no. of HFrEF patients who are hospitalized more than once with HF	17,442	17,348	17,254	17,160	17,067	17,442	17,348	17,254	17,160	17,067
Uptake rate of sacubitril/valsartan	5%	5%	5%	5%	5%	15%	20%	25%	30%	35%
Annual no. of patients treated with sacubitril/valsartan	872	867	863	858	853	2,617	3,470	4,313	5,149	5,974
Total annual costs (mUSD)	12.05	11.99	11.92	11.86	11.79	13.35	13.92	14.49	15.05	15.60
Net budget impact vs. Reference Scenario (mUSD)	-	-	-	-	-	1.30	1.93	2.56	3.19	3.80
Incremental drug costs per year (mUSD)	-	-	-	-	-	1.44	2.15	2.86	3.55	4.24
Annual budgetary savings from reduction in hospitalization (mUSD)	-	-	-	-	-	-0.05	-0.08	-0.10	-0.13	-0.15
Annual budgetary savings from reduction in mortality (mUSD)	-	-	-	-	-	-0.10	-0.14	-0.19	-0.24	-0.28
Net budget impact per patient per year (USD)	-	-	-	-	-	74.31	111.43	148.56	185.75	222.87

Figure 1: Cumulative numbers of lives saved and hospitalizations avoided over 5 years

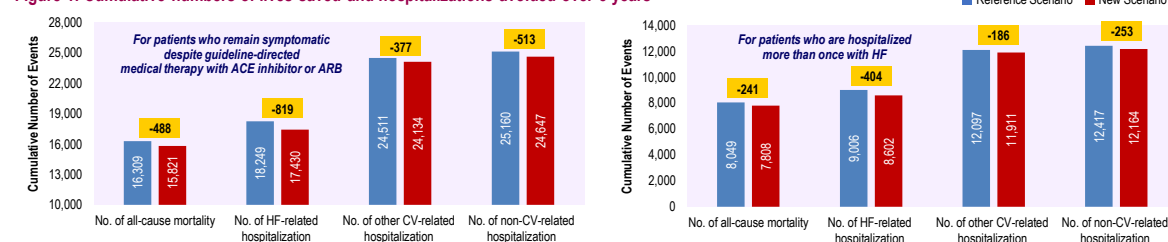
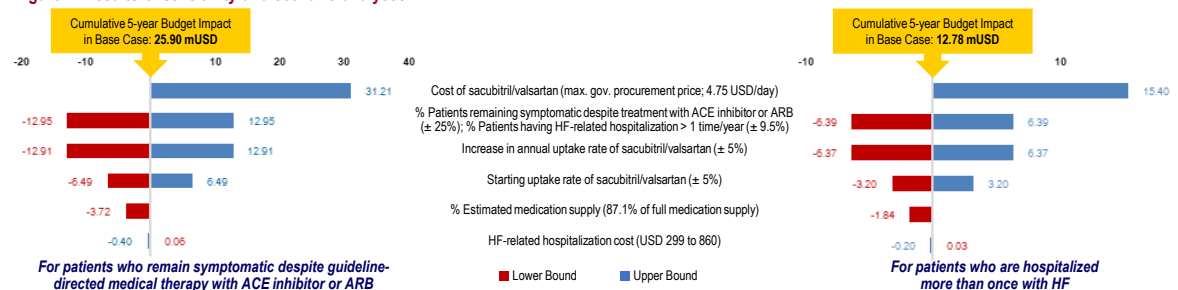


Figure 2: Results of sensitivity and scenario analyses



CONCLUSIONS

- The inclusion of sacubitril/valsartan in the national drug list has the potential to reduce hospitalization, increase lives saved, and save costs associated with hospitalization and mortality.
- The results can be used to support decision-making process to add sacubitril/valsartan to the national reimbursement in Thailand.

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