COST-UTILITY AND BUDGET IMPACT ANALYSES OF INFLIXIMAB AND ITS BIOSIMILAR IN THAI PATIENTS WITH REFRACTORY MODERATE-TO-SEVERE CROHN'S DISEASE

Phisalprapa P[1], Kositamongkol C[1], Chaiyakunapruk N[2]

[1]Mahidol University, Bangkok, Thailand, [2]University of Utah, Salt Lake City, UT, USA

OBJECTIVES:

Infliximab biosimilar was launched with promises of equivalence efficacy in the moderate-to-severe Crohn's disease (CD) treatment with lower cost. This study aimed to conduct cost-utility analysis of infliximab and its biosimilar compared to conventional therapy in refractory moderate-to-severe CD treatment in Thailand.

METHODS:

Markov model was used to estimate lifetime costs and health benefits of infliximab and its biosimilar using a societal perspective. Our analyses consisted of three choices of treatment (conventional therapy, infliximab originator, and infliximab biosimilar) and three treatment patterns (infliximab 2 years and then 3 years if relapse; infliximab 2 years and then lifelong if relapse; and infliximab lifelong). The input parameters were obtained from CD registry at Thai tertiary care hospitals, Thai health care costs, and systematic literature review. The results were reported as incremental cost-effectiveness ratios (ICERs) in 2017 US Dollars (USD) per quality-adjusted life year (QALY) gained. Sensitivity analyses were performed to assess the influence of parameter uncertainty. Threshold sensitivity analyses were carried out to determine the optimal drug prices. Finally, budget impact analyses were conducted.

RESULTS:

None of the scenarios was cost-effective at Thai willingness-to-pay threshold (4,706 USD/QALY gained). The lowest ICERs of 30,121 USD/QALY gained was reported in the scenario that included only standard dose of infliximab biosimilar with 5-year longest duration of treatment. The product prices need to be reduced by 72% and 83% of current prices to allow infliximab biosimilar and originator for being cost-effective choices of treatment, respectively. The 5-year budget impact was only 708,867 USD and 213,453 USD for full and reduced product prices, respectively.

Table 1 *Result of base-case analysis*

Regimen	Cost (USD)	Effectiveness (QALYs)	Incremental cost (ΔUSD)	Incremental effectiveness (ΔQALYs)	ICER (ΔUSD/ ΔQALYs)
CT	37,605.88	11.73			
IFX originator allowing high dose	67,376.54	12.23	29,770.66	0.50	59,786.06
IFX biosimilar allowing high dose	54,343.52	12.23	16,737.64	0.50	33,650.64
IFX originator	63,725.86	12.21	26,119.98	0.49	53,751.46
IFX biosimilar	52,226.06	12.21	14,620.18	0.49	30,121.03

CT, conventional treatment; IFX, infliximab; QALY, quality-adjusted life year; USD, United State dollars

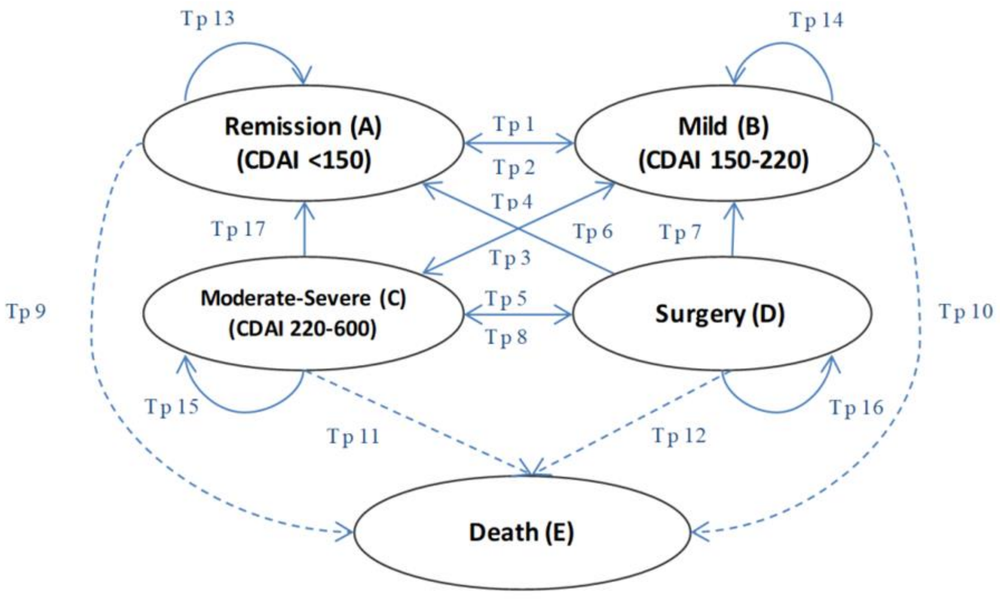

Figure 1 *Markov model*

Table 2 *Results of threshold analysis*

	Originator allowing high dose	Biosimilar allowing high dose	Originator	Biosimilar
IFX price (USD/vial)	549.81	330.35	549.81	330.35
IFX 2 years and 3 years if relapse				
% Cost reduction	84.6%	74.2%	83.2%	72.0%
New price (USD/vial)	84.88	85.14	92.17	92.43
IFX 2 years and lifelong if relapse				
% Cost reduction	87.8%	79.6%	86.6%	77.6%
New price (USD/vial)	66.98	67.32	73.70	74.05
IFX lifelong				
% Cost reduction	95.0%	91.6%	94.4%	90.6%
New price (USD/vial)	27.64	27.81	30.83	30.97

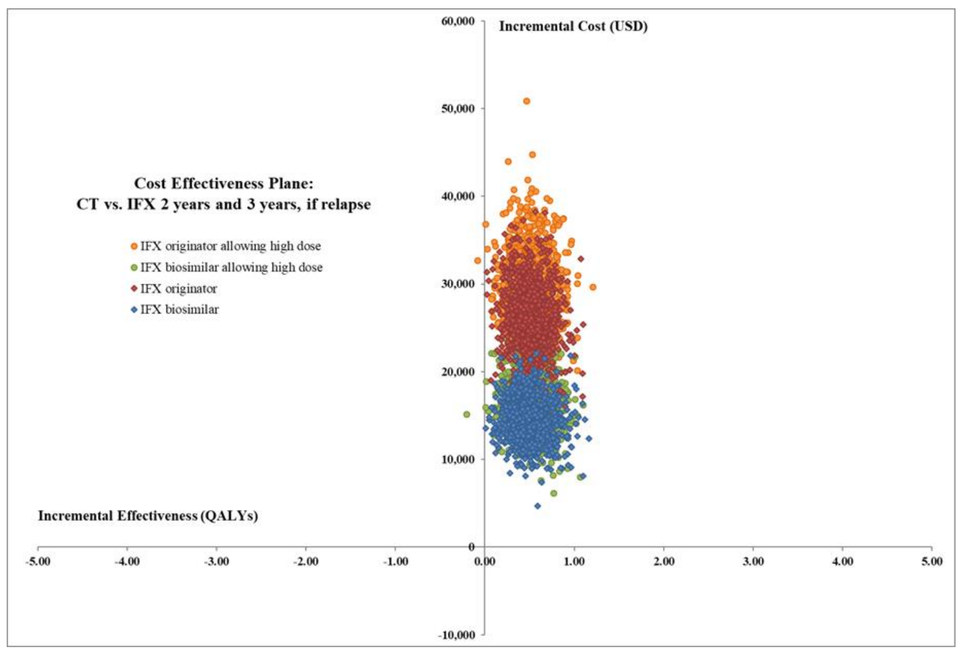

Figure 2 *Cost effectiveness plane of treatments with infliximab biosimilar compared with conventional therapy (base-case scenario)*

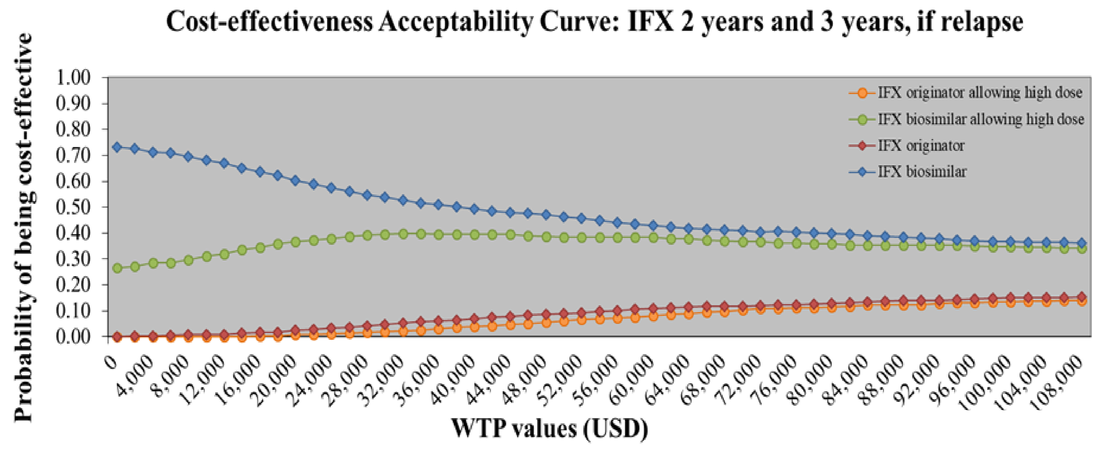

Figure 3 *Cost-effectiveness acceptability curve comparing among four IFX regimens (base-case scenario)*

CONCLUSIONS:

Infliximab and its biosimilar were not cost-effective for CD treatment in Thailand. This treatment option would be cost-effective if the product prices were significantly decreased. The best value for money treatment strategy was infliximab biosimilar with a restricted duration of treatment.