

COST-EFFECTIVENESS ANALYSIS FOR THE USE OF DUPILUMAB IN PATIENTS WITH SEVERE ASTHMA IN COLOMBIA

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Objective

- Evaluate the cost-effectiveness of dupilumab vs other biologics for the treatment of adult patients with severe asthma in Colombia from the healthcare system perspective.

Methods

- Cost-effectiveness analysis using a Markov model to estimate the costs, QALYs and exacerbations associated with the use of biologics, comparing dupilumab 200mg versus mepolizumab 100mg, benralizumab 30mg and omalizumab 300mg, 450mg and 600mg dosing as add-on therapy to the standard of care over a 5-year horizon period.
- Clinical data for responses, transition probabilities, exacerbations rates and discontinuation rates for the alternatives were obtained from published literature^{1,2,3,4}. Utility values for health states and events were taken from QUEST study post-hoc analysis and from QUEST study post-hoc analysis for Dupilumab (relates to clinical data for responses, TPs, exacerbation rates and discontinuation rates)⁵.
- Costs included treatment acquisition, treatment administration and exacerbation events management. Sources were taken from national public databases and literature (Table 1).
- One-way and probabilistic sensitivity analysis was performed for clinical and cost input parameters.

Table 1. Costs Summary

Costs	Value* (\$USD)	Units Year 1	Units Year 2+	Source
Omalizumab (150mg)	\$ 253	26 (150 mg) 39 (300 mg) 52 (450 mg)	26 (150 mg) 39 (300 mg) 52 (450 mg)	National Drug Price information system (SISMED)
Mepolizumab (100mg)	\$ 839	13	13	
Benralizumab (30mg)	\$ 1.822	8	6	
Dupilumab (200mg)	\$ 385	27	26	
Administration	\$ 35,71	-	-	National Healthcare tariff manuals
Severe exacerbation	\$ 706.33	-	-	

*per syringe/vial

1 \$USD = 3800 \$COP

Results

- Dupilumab 200mg versus mepolizumab 100mg, benralizumab 30mg and omalizumab 450mg and 600mg, has greater QALYs, lower costs and a resulting ICER of -\$4,244 USD, -\$35,553 USD, -\$177,708 USD, and -\$847,094 USD respectively (Table 2).
- Versus omalizumab 300mg, dupilumab has greater QALYs and costs, with an ICER of \$156,986, above the Willingness-to-pay threshold of 3x GDP per capita (~16,500 USD).
- Sensitivity analysis are consistent with base case results.

Table 2. Cost Effectiveness Results

Alternatives	Total costs (\$USD)	QALYs	ICER (\$USD/QALY)	# of Moderate Exacerbations	# of Severe Exacerbations
Dupilumab 200mg vs omalizumab 300mg					
Dupilumab + SoC	\$32.162	3,62	—	8,18	4,42
Omalizumab + SoC	\$28.400	3,60	\$156.986	8,12	5,09
Dupilumab 200mg vs omalizumab 450mg					
Dupilumab + SoC	\$32.162	3,62	—	8,18	4,42
Omalizumab + SoC	\$36.420	3,60	-\$177.708	8,12	5,09
Dupilumab 200mg vs omalizumab 600mg					
Dupilumab + SoC	\$32.162	3,62	—	8,18	4,42
Omalizumab + SoC	\$52.458	3,60	-\$847.094	8,12	5,09
Dupilumab 200mg vs mepolizumab 100mg					
Dupilumab + SoC	\$37.709	3,66	—	7,46	4,85
Mepolizumab + SoC	\$37.892	3,62	-\$4.244	7,63	6,13
Dupilumab 200mg vs benralizumab 30mg					
Dupilumab + SoC	\$38.956	3,73	—	7,98	4,85
Benralizumab + SoC	\$42.205	3,64	-\$35.553	8,17	7,85

1 \$USD = 3800 \$COP

Conclusion

- Dupilumab 200mg is cost-effective versus mepolizumab 100mg, benralizumab 30mg and omalizumab 450mg and 600mg. Compared to omalizumab 300mg, dupilumab is deemed as not cost-effective.
- Dupilumab 200mg can be expected to be cost-effective when it is globally compared to omalizumab, since the average dose for a usual cohort is 450mg or above.
- This analysis based on indirect comparisons is useful for decision making process to choose biologic therapies for the treatment of patients with severe asthma.

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