

Modeling early versus late intervention strategies: the case of dupilumab in children with severe atopic dermatitis

Poster Number: EE584

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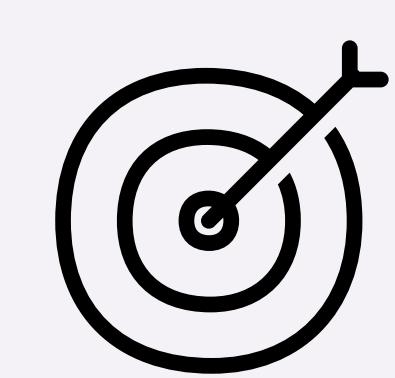
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INTRODUCTION

Atopic dermatitis (AD) is a chronic, relapsing inflammatory skin disease characterized by intense pruritus and barrier dysfunction. It often begins early in life and affects up to 17% of French children and adolescents.¹

Dupilumab is the first biologic approved in France for severe AD in children aged 6–11 years² and for moderate-to-severe AD in adolescents³ and adults⁴. Early intervention may improve long-term disease control and quality of life (QoL)⁵.

OBJECTIVE



This study used a modeling approach to evaluate the cost-effectiveness of initiating dupilumab at age 6 versus age 12 in severe pediatric AD patients, comparing health and economic outcomes over 12-year horizon between early and delayed treatment strategies.

METHODS

- A cost-effectiveness model previously submitted and accepted by several Health Technology Assessment bodies, including the French Haute Autorité de Santé (HAS)^{6,7}, was adapted (see Figure 1) and methodologically extended to allow comparison of two strategies:
 - (1) dupilumab 6-year strategy: dupilumab initiated at age 6 with best supportive care (BSC), and
 - (2) dupilumab 12-year strategy: dupilumab initiated at age 12 after BSC alone in children aged 6 to 11.
- Modeling assumptions validated in previous HAS-reviewed submissions for adolescents and adults were retained where relevant. Clinical inputs were sourced from Phase 3 trials in children and adolescents (R668-AD-1652 and R668-AD-1526 studies)^{8,9}.
- Health-related quality of life inputs and resource utilization were derived from real-world studies (ECLAJUNIOR and ECLADO).

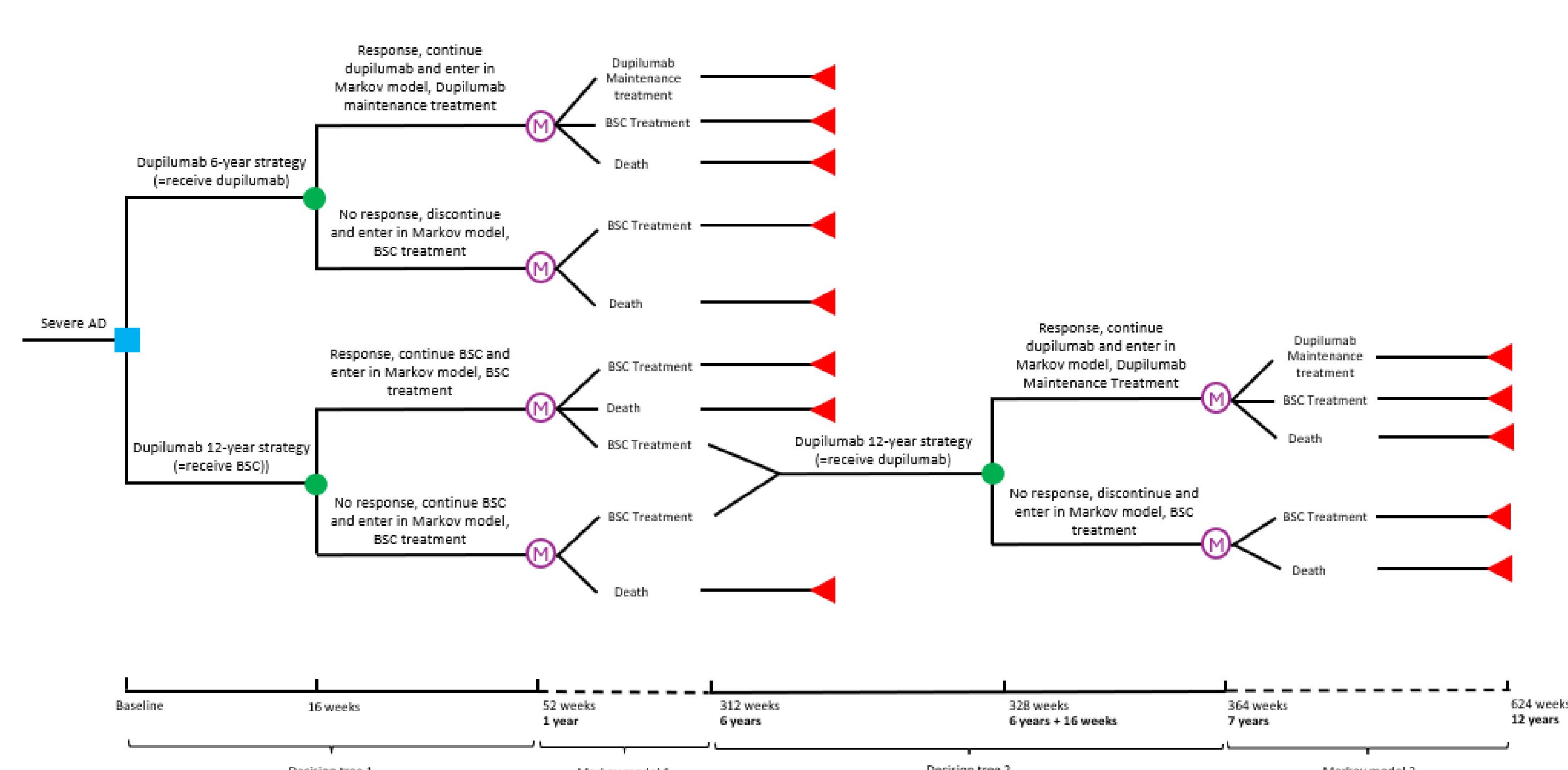


Figure 1. Model structure

RESULTS

Base case results

Early initiation of dupilumab compared to delayed treatment resulted in:

+€24,475
 1.26
Incremental Cost **QALY gained** **ICER**
€19,482 /QALY

Table 1. Main results

Outcome	dupilumab 6-year strategy	dupilumab 12-year strategy	Increment	ICER
Total costs	€81,796	€57,322	€24,475	-
Total QALYs	6.98	5.73	1.26	19,482 €/QALY
EASI-75 Responder years	5.87	3.80	2.07	11,798 €/EASI-75 responder year

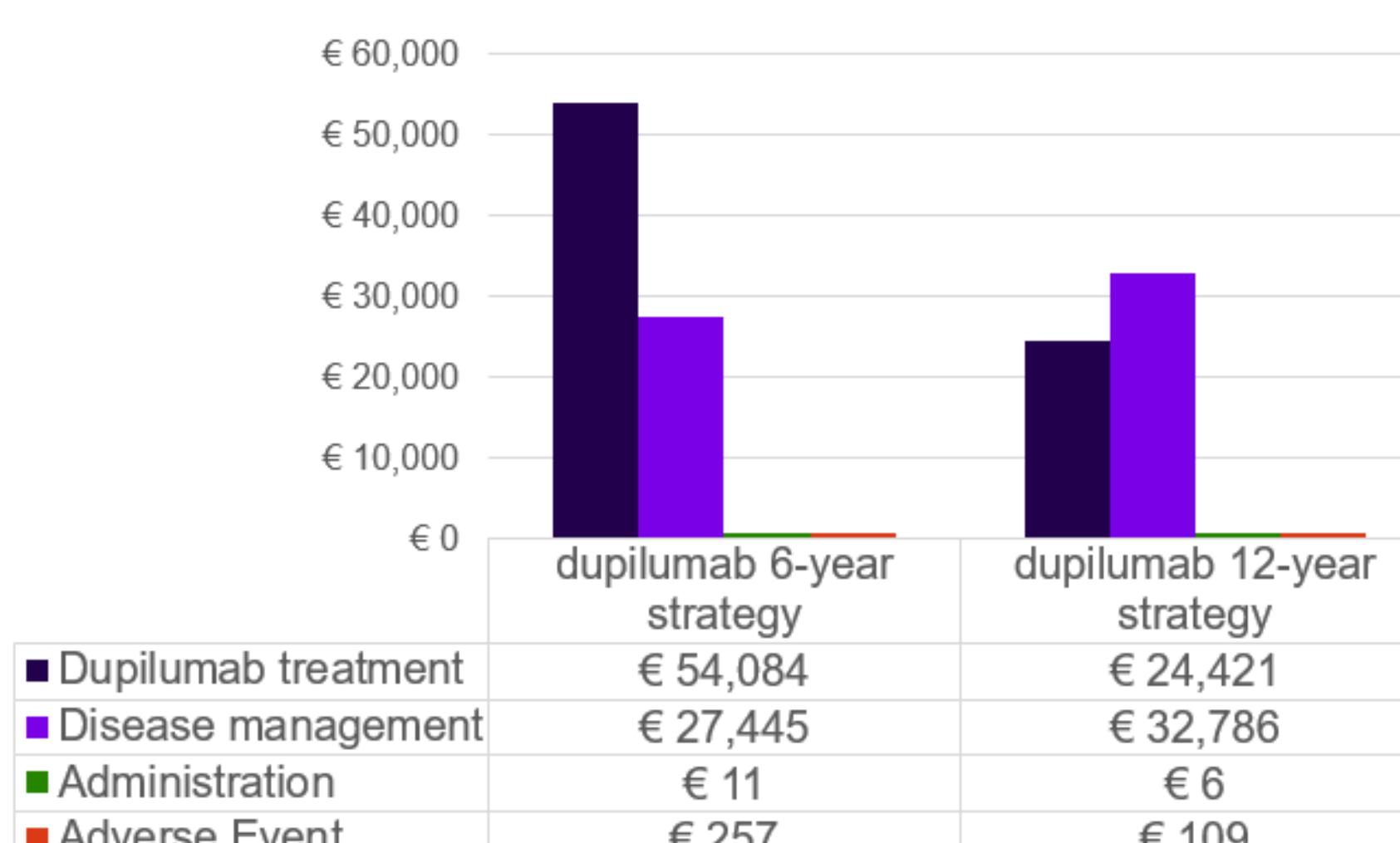


Figure 2. Disaggregated costs according to the strategy



+€29,663 for treatment cost



-€5,340 for disease management

Deterministic & probabilistic analyses

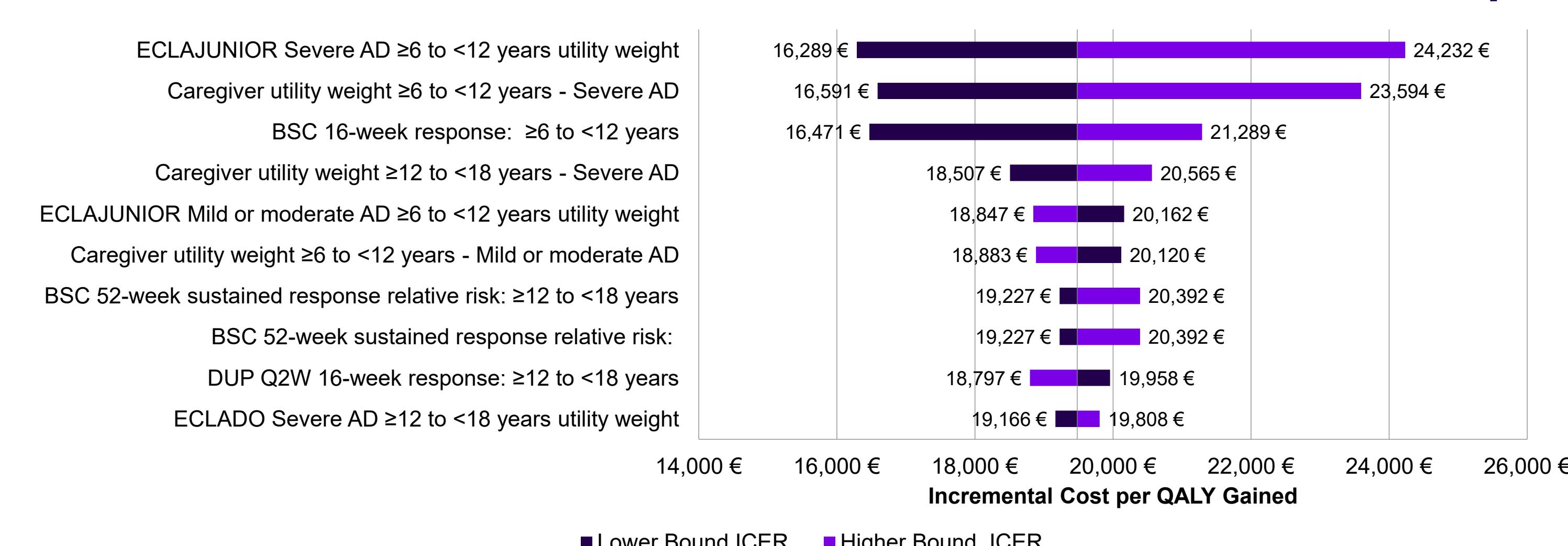


Figure 3. Tornado diagram

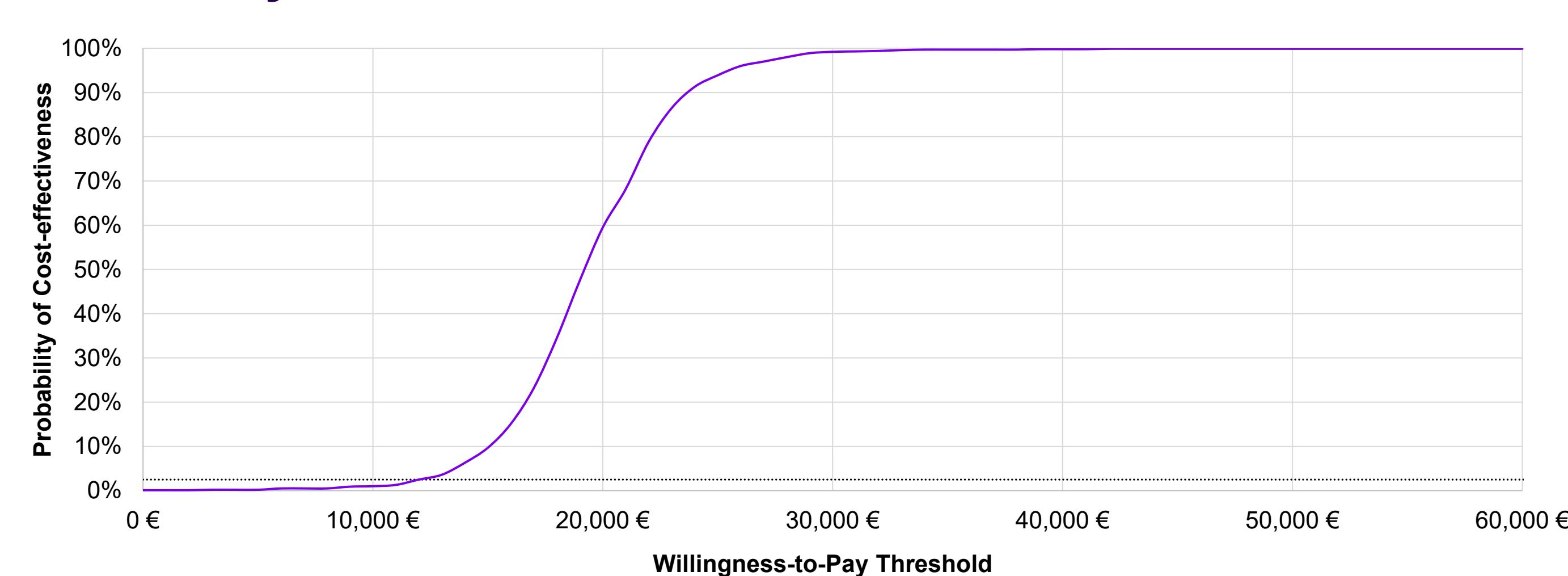
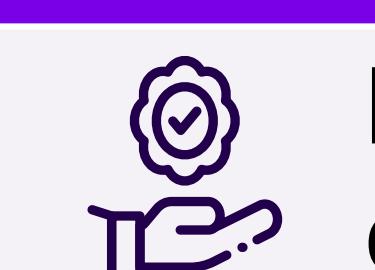


Figure 4. Cost Effectiveness Acceptability Curve

Deterministic sensitivity analysis showed the ICER was most sensitive to utility parameters for children and caregivers. Probabilistic sensitivity analysis confirmed robustness, with a >99% probability of cost-effectiveness at a €30,000/QALY willingness-to-pay threshold

CONCLUSIONS



Early initiation of dupilumab at age 6 is a cost-effective strategy for children with severe AD in France, delivering superior clinical and economic outcomes compared to delayed treatment.

References. ¹Silverberg JI. Atopic dermatitis in the pediatric population. Ann Allergy Asthma Immunol 2021. ²HAS. CT opinion - DUPIXENT - Children - Atopic Dermatitis [Internet] 2021. ³HAS. CT opinion - DUPIXENT - Adolescent - Atopic Dermatitis [Internet] 2020. ⁴HAS. CT opinion - DUPIXENT - Adult - Atopic Dermatitis [Internet] 2018. ⁵Vakirlis E et al. Insights into Early Systemic Treatment in Atopic Dermatitis: Scientific Facts and Practical Considerations. Dermatol Ther (Heidelberg). 2024 Mar;14(3):563-568. ⁶HAS. CEESP opinion - DUPIXENT - Children - Atopic Dermatitis [Internet] 2021. ⁷HAS. CEESP opinion - DUPIXENT - Adolescent - Atopic Dermatitis. 2020. ⁸Paller AS, Siegfried EC, Thaci D, et al. Efficacy and safety of dupilumab with concomitant topical corticosteroids in children 6 to 11 years old with severe atopic dermatitis: A randomized, double-blind, placebo-controlled phase 3 trial. J Am Acad Dermatol. 2020 Nov;83(5):1282-1293. ⁹Simpson EL, Paller AS, Siegfried EC, et al. Efficacy and Safety of Dupilumab in Adolescents With Uncontrolled Moderate to Severe Atopic Dermatitis: A Phase 3 Randomized Clinical Trial. JAMA Dermatol. 2020;156(1):44-56.

ICER: Incremental Cost-Effectiveness Ratio; **QALY:** Quality-Adjusted Life Year

CONFLICTS OF INTEREST

Jules TAVI, Noémie ALLALI, Kerry NOONAN and Anne-Lise VATAIRE are Sanofi employees and may hold stock and/or stock options in the company. Marine SIVIGNON and Olfa DOGHRI are Putnam employees.

This study was funded by Sanofi.