EE112

Budget impact analysis of bimekizumab for the treatment of active psoriatic arthritis (PsA) in Greece

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Objectives

To assess the budgetary impact of introducing bimekizumab, as a treatment option for adult patients with active psoriatic arthritis (PsA), previously treated with conventional synthetic disease-modifying antirheumatic drugs (csDMARDs) in Greece, alongside currently available biologic therapies, Janus kinase (JAK) inhibitors and apremilast.

Background

- PsA is included in the group of peripheral spondyloarthritis (SpA) diseases and it is a chronic immune-mediated inflammatory disease, usually seronegative for rheumatoid factor, involving both the skin and musculoskeletal system[1,2].
- Current PsA treatments with European authorization include csDMARDs such as methotrexate, various biological (b)DMARDs targeting different cytokines, such as tumor necrosis factor-alpha (TNFa), interleukin (IL)-12/23 and IL-17A, and targeted synthetic (ts)DMARDs that inhibit phosphodiesterase-4 (PDE4) or JAKs.
- The suboptimal management of PsA, marked by inadequate response, frequent switching, and significant patient burden, highlights the need for new therapeutic options to improve outcomes[3,4,5].
- Bimekizumab is a humanized immunoglobulin G1 (IgG1) monoclonal antibody that selectively inhibits IL-17F in addition to IL-17A and has shown sustained clinical efficacy and tolerability for up to two years in patients with PsA[6].
- European Union has granted authorization in bimekizumab for the treatment of patients with active PsA on the April 26th, 2023.

Methods

Budget Impact Model Structure

- A budget impact model was adapted from a public-payer perspective to project the financial implications of including bimekizumab in the PsA treatment landscape over five-years (2025-2029).
- The target population was estimated using a top-down approach beginning with the total adult general population of Greece (Figure 1).
- Distribution of patients between comparators was based on local market share information.
- Treatment efficacy is considered in the analysis as it drives time on treatment and therefore influences drug costs.
- Direct reimbursement costs of each treatment (including drug acquisition, administration, monitoring, disease management and adverse events) were included in the analysis (Table 1).
- A constant annual discontinuation probability of 16.5% was applied and represented discontinuation due to any cause, including loss of efficacy and safety concerns[7,8].
- The model outcome was the financial impact of bimekizumab defining its incremental cost and its total budget impact.

Model Inputs

- A population of adult patients with active PsA previously treated with cDMARDs was defined as the eligible population, using a set of demographic (e.g., general population estimates, annual population growth, annual population mortality), and clinical and epidemiologic parameters (e.g., prevalence and incidence of PsA) (Table 2).
- Apremilast, JAKs and all biologics (original/biosimilars) that are currently marketed and recommended for active PsA in Greece, were included.
- Local market share estimates with and without bimekizumab were based on market insights of UCB and a recent market research in Greece (Greek Physician Market Research 2023) (Table 3).
- Efficacy inputs of treatment response measured by American College of Rheumatology (ACR50) and surrogate data for Health assessment questionnaire disability index (HAQ-DI) changes, were based on BE-COMPLETE and BE-OPTIMAL trials[9,10], and a published network meta-analysis[11] of published clinical trials (excluding HAQ-DI data).
- Unit cost of each treatment was calculated based on ex-factory prices published in the latest drug price bulletin issued by the Greek ministry of health[12], after applying the relevant discounts provided in the corresponding legislation (official government gazette, law 115/7.8.2017).

Sensitivity Analysis

- Deterministic sensitivity analysis (DSA) was conducted by varying several parameters from the original estimates to test the robustness of base case results.
- Scenario analyses were also conducted, excluding monitoring and adverse event costs from the analysis, and changing the time horizon from 1 to 4 years (base case = 5 years).

Results

Base-Case Analysis

- The eligible population ranged from 7,858 in the first year to 8,242 patients in the fifth year. The number of patients treated with bimekizumab in the new market scenario was estimated to increase from 51 in 2025 to 597 in 2029.
- Adding bimekizumab in the PsA market, resulted in an average cost per patient of €169.
- Over the five-year horizon, the inclusion of bimekizumab led to an increase in public expenditure, with an average annual total budget impact of €1,372,979 (Figure 2).

Scenario and Sensitivity Analyses

Sensitivity analyses showed no major deviations from the base case analysis.

Conclusions

Based on this budget impact analysis, the introduction of bimekizumab to the PsA market in Greece is expected to have a minimal budgetary impact.

Summary

Analysis Population:
Greek adults with active psoriatic arthritis

Analysis Comparator:
Biologic therapies, Janus kinase inhibitors (JAKs), and apremilast, currently available in the Greek market

Analysis year:
2023

Analysis results:
An average total budget impact of €1,372,979 per year

Figure 1 PsA population derivation

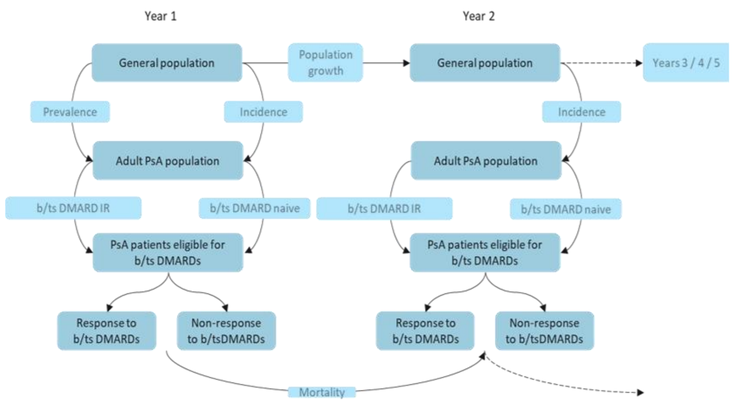

Figure 2 Total annual incremental costs and cumulative costs (5-years period)

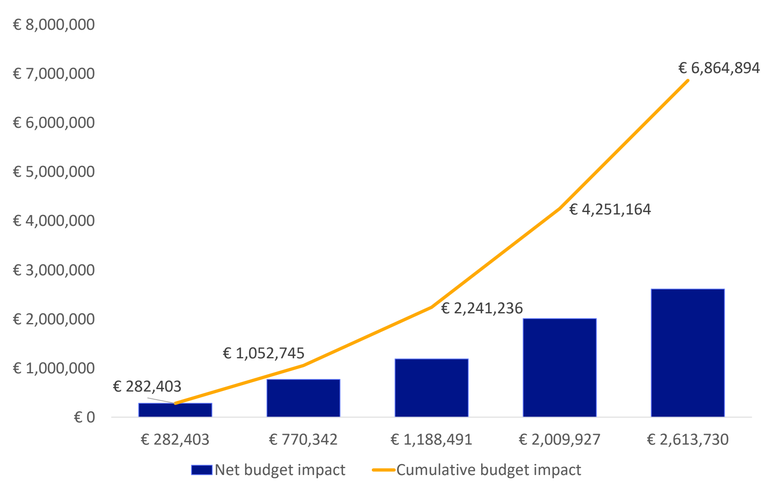

Table 1 Costs used in the analysis

Drug acquisition costs for the different treatments[1]

Treatment	Pack size	Dose (mg) per vial/ syringe/ tablet	Cost per pack (Ex-Factory price)
Bimekizumab	2	160	€ 2,147.55
Adalimumab	1	40	€ 252.83
Adalimumab (Biosimilar)	2	40	€ 300.15
Apremilast	56	30	€ 455.30
Certolizumab pegol	2	200	€ 566.06
Etanercept	4	50	€ 471.77
Etanercept (Biosimilar)	4	50	€ 420.55
Golimumab	50	1	€ 609.32
Guselkumab	1	100	€ 1,605.69
Infliximab IV	1	100	€ 265.95
Infliximab (Biosimilar) SC	2	120	€ 689.69
Ixekizumab	2	80	€ 1,701.87
Risankizumab	2	75	€ 2,530.70
Secukinumab 150mg	1	150	€ 429.28
Secukinumab 300mg	2	150	€ 852.15
Tofacitinib	56	5	€ 583.31
Ustekinumab	1	45	€ 2,000.09
Upadacitinib	28	15	€ 673.82

Treatment monitoring[2] Service	Unit cost per service
Antinuclear antibody (ANA)	€ 7.35
DNA binding (dsDNA)	€ 12.75
Erythrocyte Sedimentation Rate	€ 1.00
Full blood count	€ 1.69
Liver Function Test	€ 5.92
Tuberculosis Blood Test	€ 1.50
Urea and Electrolytes Test	€ 4.30
Chest Radiograph	€ 3.44

Disease Management costs[3]	Mean
Baseline disease management cost	€242
Cost per 1 unit HAQ change	€107

Adverse event costs[4]	Cost per event
Serious infection	€1,563

Sources: [1] Latest drug price bulletin issued by the Greek ministry of health[12]; [2] Unit costs derived from Government Gazette (FEK 1181B'/8-5-2014) and EOPYY official website[19]; [3] Buchanan V. et al.[20], inflated to 2023 GBP (£) values and converted to Greek euros (€) based on economic database of Organization for Economic Co-operation and Development[21] (using the latest available Purchasing Power Parities [PPP] ratio in US dollars for health indicator: US$ = €0.528 for Greece and US$ = £0.664 for UK); [4] Local clinical experts' estimation.

Table 2 Overview of eligible PsA patient population inputs

Population inputs	Greek Patients[a]	Source
Prevalence of PsA (0.17%)	15,206	Andrianakos. A., et al. 2003[13]; Trontzas et al. 2005[14]; Tzanetakos C., et al. 2014[15]; Local clinical experts' estimates
Incidence of PsA (0.003%)	277	Kousoulakos H., et al. 2014[16]; Alamanos Y., et al. 2003[17]; Local clinical experts' estimates
Percentage of patients with PsA eligible to receive treatment with b/tsDMARDs (51%)	7,858	Bournia VK., et al. 2020[18]; Greek Physician Market Research Oct-Nov 2022; Local clinical experts' estimates

Note: [a] Data apply to each year (2025-2029)

Table 3 Market shares in the world without & with bimekizumab in PsA

	Current scenario (current treatment mix)					Future scenario (New treatment mix)				
Treatment	**2025**	**2026**	**2027**	**2028**	**2029**	**2025**	**2026**	**2027**	**2028**	**2029**
Bimekizumab	0%	0%	0%	0%	0%	1.80%	2.40%	4.60%	6.70%	8.20%
Adalimumab	10.00%	9.00%	8.40%	8.00%	8.00%	10.00%	9.00%	8.00%	8.00%	8.00%
Adalimumab (Biosimilar)	15.00%	14.20%	14.00%	14.00%	14.00%	15.00%	14.20%	14.00%	14.00%	14.00%
Apremilast	8.00%	8.00%	7.00%	6.00%	6.00%	8.00%	8.00%	7.00%	6.00%	5.40%
Certolizumab pegol	6.00%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.00%
Etanercept	7.00%	6.50%	6.50%	6.00%	5.50%	7.00%	6.30%	6.00%	6.00%	5.00%
Etanercept (Biosimilar)	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	2.00%	2.00%
Golimumab	5.00%	5.00%	4.50%	4.50%	4.00%	5.00%	5.00%	4.50%	4.50%	4.30%
Infliximab	4.00%	5.00%	6.00%	6.00%	7.00%	4.00%	5.00%	6.00%	6.00%	6.30%
Infliximab (Biosimilar)	2.50%	2.30%	2.50%	2.50%	2.50%	2.50%	2.30%	2.50%	2.50%	2.50%
Ixekizumab	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%	3.10%
Risankizumab	3.20%	4.00%	4.00%	5.00%	5.00%	3.00%	3.80%	3.80%	4.00%	4.50%
Secukinumab 150mg	4.00%	5.00%	6.00%	6.00%	7.00%	4.00%	5.00%	5.00%	5.00%	5.00%
Secukinumab 300mg	12.00%	11.00%	11.00%	11.00%	10.00%	11.50%	11.00%	10.00%	10.00%	10.00%
Tofacitinib	3.30%	3.50%	3.00%	3.00%	3.00%	3.20%	3.00%	2.50%	2.20%	2.00%
Ustekinumab	1.90%	2.40%	2.50%	3.00%	3.00%	1.90%	2.20%	2.60%	2.60%	2.80%
Upadacitinib	5.00%	5.00%	5.00%	5.00%	5.00%	5.50%	5.00%	5.00%	5.00%	5.00%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

ACR: American College of Rheumatology; b/tsDMARDs: biologic/targeted synthetic disease-modifying antirheumatic drugs; cDMARDs: conventional disease-modifying antirheumatic drugs; DSA: deterministic sensitivity analyses; HAQ-DI: Health Assessment Questionnaire Disability Index; IgG1: immunoglobulin G1; IL: Interleukin; JAKs: Janus kinase inhibitors; NMA: network meta-analysis; PASI: Psoriasis Area and Severity Index; PsA: psoriatic arthritis; SpA: spondyloarthritis; TNFi: tumor necrosis factor-alpha inhibitors

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Available at: http://www.oecd.org/. **Author Contributions:** Substantial contributions to study conception/design, or acquisition/analysis/interpretation of data: **KM, RS, KV, FM**; Drafting of the publication, or revising it critically for important intellectual content: **KM, RS, DD, DT, PC, SP, KV, FM, KG, LN, WD**; Medical writing: **RS**; Final approval of the publication: **DD, DT, PC, SP, KV, FM, KG, WD**. **Author Disclosures: MK, RS:** employees of ECONCARE LP which had contracts with UCB, Abbvie, Leo, BMS. **DT:** no conflict of interest. **SP:** Research grants and/or consultant's fees from Abbvie, Boehringer, Pfizer, UCB, Eli-Lilly, BIANEΣ, ELPEN, Genesis, Sobi, Demo, Yansen. **VK, FM**: employee of UCB, Greece. **GK:** Payments from Aristotle University, Thessaloniki. Contract with Pfizer via University of the Peloponnese. Contracts with UCB, Abbvie, Leo, BMS via consulting firm. **LN:** employee of UCB, UK. **DW**: employee of UCB, Belgium. **Acknowledgements:** This study was funded by UCB. The authors acknowledge Frederik Fierensand, Sergei Kalynych and Martina Hazlingerova, UCB for publication coordination and Charlotte Frall, Costello Medical, Bristol, UK and Shimaila Siddiqui, Costello Medical, Manchester, UK for editorial assistance. All costs associated with development of this poster were funded by UCB.

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Poster ID: EE112

Link expiration: November 20, 2024