Budget impact analysis of bimekizumab for the treatment of moderate-to-severe plaque psoriasis in Greece

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Objective

To investigate the budgetary impact from the introduction of bimekizumab as a treatment option for patients with moderate-to-severe plaque psoriasis in Greece alongside currently available biologic therapies or apremilast.

Introduction

- Psoriasis is a chronic, immune-mediated disease, resulting in the rapid buildup of the cells on the surface of the skin [1].
- Individuals with moderate-to-severe plaque psoriasis are at an increased risk of developing other chronic and serious health diseases (psoriatic arthritis, metabolic syndrome or components of the syndrome, cardiovascular disorders, anxiety and depression, non-alcoholic fatty liver disease, Crohn's disease, and lymphoma [1-5]).
- Despite the number of currently available therapies (biologic systemic therapies and oral small molecules), there remains an unmet need in the psoriasis treatment landscape for therapeutic agents that can provide more meaningful improvement in the extent and severity of plaque psoriasis for the vast majority of patients.
- Bimekizumab is a humanized immunoglobulin G1 (IgG1) monoclonal antibody, approved by the EMA (European Medicines Agency) [6, 7].
- Bimekizumab selectively binds with high affinity to IL-17A, IL-17F and IL-17AF cytokines, blocking their interaction with the IL-17RA/IL-17RC receptor complex [6], thus offering an advantageous and unique approach to psoriasis management.

Methods

Budget Impact Model Structure

- A budget impact model was adapted, from a public payer perspective, to depict the financial implications of bimekizumab's inclusion in the currently marketed psoriasis treatments, over the next 5 years (2023–2027).
- The model (**Figure 1**) determined:
  - Patient population based on epidemiological data of Greek psoriatic patients (**Table 1**),
  - Patients' distribution between comparators based on local market share information,
  - Direct reimbursement costs of each treatment (including drug acquisition, administration, monitoring and adverse events [**Table 2**]).
- A constant annual discontinuation probability was applied annually and represented discontinuation due to any cause, including loss of efficacy and safety concerns [8, 9].
- The number of patients that discontinued per treatment per year, could initiate a new treatment the following year based on predefined treatment sequences (**Table 2**).
- The model outcome was the financial impact, measured as incremental cost and total budget impact, of bimekizumab (**Figure 2**).

Model Inputs

- The estimated population was adults with moderate-to-severe plaque psoriasis eligible for treatment with biological agents or apremilast (**Table 1**).
- Apremilast and all biologics (original/biosimilars) that were marketed and recommended for moderate-to-severe plaque psoriasis in Greece, at the time of the analysis, were included.
- Local market share estimates with and without bimekizumab were based on UCB market forecast estimates (**Table 3**).
- Unit cost of each treatment was based on the ex-factory price as it was published in the drug price bulletin issued by the Greek Ministry of Health [10] (**Table 2**), after applying the relevant discounts provided in the corresponding legislation (official government gazette, law 115/07.08.2017 law 4274/22.11.2019).
- Frequency of administration were based on the SmPCs accessed by the EMA/EU Community Register.
- A mean patient weight of 89.6 kg was used to calculate total dosing requirements for weight-based dosing drugs and drug wastage arising from the partial use of a vial was assumed, based on clinical experts' input.

Sensitivity Analyses

- One-way sensitivity analyses were conducted by varying the proportion of patients eligible for biologic therapy (±10% of the original estimate), discontinuation rate (±25% of the original estimates), monitoring and adverse event costs (excluded them from the analysis), and time horizon (1–4 years, base case=5 years).

Results

Base-Case Analysis

- The number of patients treated with bimekizumab in the new market scenario was estimated to increase from 316 in 2023 to 738 patients in 2027.
- Adding bimekizumab to the Greek psoriasis market, resulted in an average total budget of €2,597,056 per year.
- Through the years, the inclusion of bimekizumab in the market, resulted in a limited increase in the public expenditure for psoriasis biologic and apremilast treatment, with a total and per patient net budget impact of €12,985,280 (+3% compared to scenario without bimekizumab) and €1,231, respectively, over a 5-year time horizon (**Figure 2**).

Sensitivity Analyses

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

Conclusion

This budget impact analysis suggests that the induction of bimekizumab in the market of moderate-to-severe plaque psoriasis in Greece, would have a limited budgetary impact considering its promising clinical benefits.

Summary

Objective: To estimate the budgetary impact of adding Bimekizumab in Greece for the treatment of moderate-to-severe plaque psoriasis, from a public payer perspective.

Greek adults with moderate-to-severe plaque psoriasis eligible for treatment with biological agents or apremilast

Calculations were based on drug acquisition, administration, monitoring and AE costs

Annual and cumulative data for a 5-year time horizonnalysis year

Limited increase in the public expenditure: **+3% increment of net budget impact**

An average total budget of €2,597,056 per year

Main Conclusion: The inclusion of bimekizumab for the treatment of moderate-to-severe plaque psoriasis was predicted to have a limited budgetary impact considering its promising clinical benefits in Greece.

Table 1 Greek epidemiological data

Data	Greek Patients[a]	Source
Prevalence of psoriasis (2%)	183,821	Gourzoulidis et al. (2019)[11]/ Clinical experts
Patients with plaque psoriasis (85%)	156,248	Rigopoulos et al. (2010)[12]/ Clinical experts
Treated patients with moderate-to-severe plaque psoriasis (27%)	42,187	Gourzoulidis et al. (2019)[11]/ Clinical experts
Patients treated with biological agents/ apremilast (25%)	10,547	Gourzoulidis et al. (2019)[11]/ Clinical experts

[a] Data apply to each year 2023-2027

Figure 1 Budget impact model structure

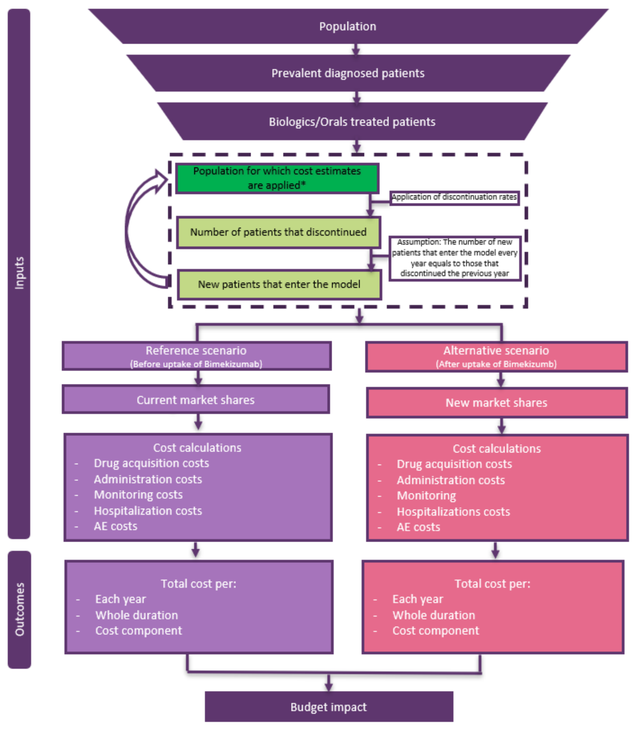

Figure 2 Total annual incremental costs and cumulative costs (5-years period)

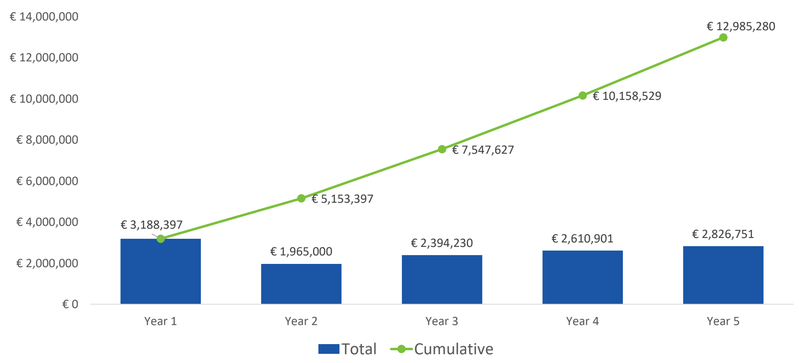

Table 2 Costs, treatment doses and discontinuation probabilities used in the analysis

Drug acquisition costs	Pack size	Dose (mg) per vial/ syringe/ tablet	Pack cost (Ex-factory price in €)[d]	Annual discontinuation probabilities [8, 9]
Bimekizumab	2	160	€2,483	7%
Adalimumab	1	40	€292	15%
Adalimumab (biosimilar)	2	40	€431	15%
Apremilast	56	30	€491	15%
Brodalumab	2	210	€981	7%
Certolizumab pegol 200mg[a]	2	200	€592	15%
Certolizumab pegol 400mg[a]	2	200	€592	15%
Etanercept	4	50	€545	15%
Etanercept (biosimilar)	4	50	€469	15%
Guselkumab	1	100	€1,656	7%
Infliximab[b]	1	100	€307	15%
Infliximab (biosimilar)[b]	1	100	€248	15%
Ixekizumab	2	80	€1,801	7%
Risankizumab	2	75	€2,598	7%
Secukinumab	2	150	€877	7%
Ustekinumab 45mg[c]	1	45	€2,043	7%
Ustekinumab 90mg[c]	1	90	€2,068	7%

Monitoring & Adverse event costs

Type of therapy	Initial Period (€)[e]	Maintenance Period (€)[e]
SC	43	84
IV	62	125
Adverse event costs	**Unit cost (€)[f]**	**Source**
Serious Infection	1,351	Tzanetakos et al. 2016 [13]

[a]90% of patients were assumed to receive the 200 mg regimen and 10% to receive the 400 mg treatment [11]. [b]Based on a patient weight of 89.6 kg and including the cost of wastage. [c]80% of patients were assumed to receive the 45mg regimen and 20% to receive the 90mg, based on clinical experts. [d]Unit cost of each treatment was based on the ex-factory price, after also applying the relevant discounts provided in the corresponding legislation (official government gazette, law 115/07.08.2017 law 4274/22.11.2019. [e]Costs and frequency of resources used in the analysis were retrieved from EOPYY official website and Government Gazette. FEK 1181B', 08-05-2014 and clinical experts' opinion. [f]Costs were inflation-adjusted from the original reporting year to current values using the health component of the consumer price index from the National Statistical Service, EL.STAT [14].

Table 3 Market share scenarios with and without bimekizumab

	World without bimekizumab					World with bimekizumab				
Technology	2023	2024	2025	2026	2027	2023	2024	2025	2026	2027
Bimekizumab	-	-	-	-	-	3.00%	5.00%	6.00%	6.50%	7.00%
Adalimumab	5.00%	4.00%	3.00%	3.00%	3.00%	5.00%	4.00%	3.00%	3.00%	3.00%
Adalimumab (biosimilar)	2.00%	1.00%	1.00%	1.00%	1.00%	2.00%	1.00%	1.00%	1.00%	1.00%
Apremilast	19.00%	18.00%	18.00%	17.00%	17.00%	19.00%	18.00%	18.00%	17.00%	17.00%
Brodalumab	8.00%	8.00%	7.00%	7.00%	7.00%	6.50%	5.70%	4.30%	4.10%	4.00%
Certolizumab pegol 200mg	4.50%	4.50%	4.50%	4.50%	3.60%	4.50%	4.50%	4.50%	4.50%	3.60%
Certolizumab pegol 400mg	0.50%	0.50%	0.50%	0.50%	0.40%	0.50%	0.50%	0.50%	0.50%	0.40%
Etanercept	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Etanercept (biosimilar)	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Guselkumab	7.00%	10.00%	12.00%	14.00%	15.00%	6.90%	9.90%	11.90%	13.90%	14.90%
Infliximab	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Infliximab (biosimilar)	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Ixekizumab	6.00%	8.00%	10.00%	10.00%	10.00%	5.00%	6.00%	7.50%	7.30%	7.10%
Risankizumab	10.00%	13.00%	15.00%	17.00%	17.00%	9.80%	12.60%	14.50%	16.40%	16.20%
Secukinumab	19.00%	17.00%	15.00%	14.00%	14.00%	18.90%	16.90%	14.90%	13.90%	13.90%
Ustekinumab 45mg	12.00%	9.60%	8.00%	6.40%	6.40%	11.95%	9.55%	7.95%	6.35%	6.35%
Ustekinumab 90mg	3.00%	2.40%	2.00%	1.60%	1.60%	2.95%	2.35%	1.95%	1.55%	1.55%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

SC: subcutaneous; **IV:** Intravenous

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