Cost per Responder of Brodalumab Versus Other IL-17 Inhibitors in Patients With Moderate-to-Severe Plaque Psoriasis and High Body Weight: A Decision-Tree Analysis From the Italian NHS Perspective

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Background

- Up to 60–78% of people with psoriasis live with overweight or obesity [1], and higher body weight is associated with lower PASI 90 response to biologics, especially IL-17 inhibitors [2].
- In heavier patients, the secukinumab SmPC allows intensified dosing (300 mg every 2 weeks for ≥90 kg), which raises acquisition costs. **Brodalumab is dosed at a fixed 210 mg Q2W regardless of body weight.**
- Weight-specific economic evidence to guide biologic choice in the Italian NHS is limited.

Objective

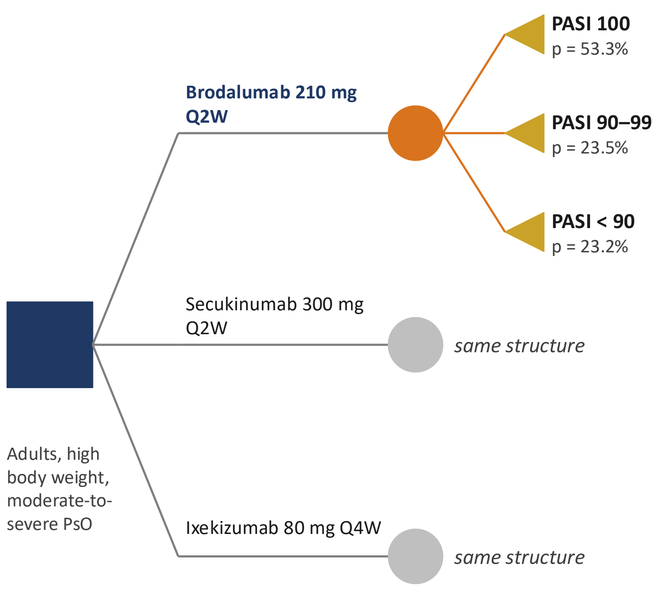
To estimate the 1-year expected direct cost and the cost per PASI 90 and PASI 100 responder of brodalumab versus secukinumab and ixekizumab in adults with moderate-to-severe plaque psoriasis and high body weight, from the Italian NHS perspective.

Methods

- **Model:** cost-per-responder model in MS Excel, adapted from Nyholm et al. [3]; Italian NHS perspective, 52-week horizon, no discounting.
- **Population & dosing:** adults with moderate-to-severe plaque psoriasis and high body weight; SmPC regimens for heavier patients (doses at weeks 0–51).
- **Efficacy:** PASI 90/100 from weight-specific subgroups (≥90 to ≥100 kg), week 52 where available; brodalumab vs secukinumab adjusted via unanchored MAIC [4,5].
- **Costs:** drug at AIFA ex-factory prices net of legal reductions [6] + management by response state (visits, labs, topicals) [7].
- **Outcomes:** cost per PASI 90 responder (primary) and per PASI 100 responder; year-1 vs year-2 drug cost (induction effect).

How cost per responder is calculated

One branch per comparator; the brodalumab branch is shown in full.



Expected cost per patient = drug cost + Σ p × management cost (responder €110; PASI <90 €281 per year). Cost per responder = drug cost ÷ proportion of responders at week 52 (brodalumab: €14,175 ÷ 76.8% = €18,457 per PASI 90 responder).

Key inputs

Comparator	Units / yr	€ / unit*	PASI 90	PASI 100	Evidence (weight, week)
Brodalumab	27	525.00	76.8%	53.3%	≥90 kg, wk 52, MAIC [5]
Secukinumab	28	947.63	66.0%	40.6%	≥90 kg, wk 52 [4]
Ixekizumab	17	962.07	70.5%	45.6%	≥100 kg, wk 12† [8]

**AIFA ex-factory price net of legal reductions. †Assumed maintained to week 52 (no weight-specific long-term data).*

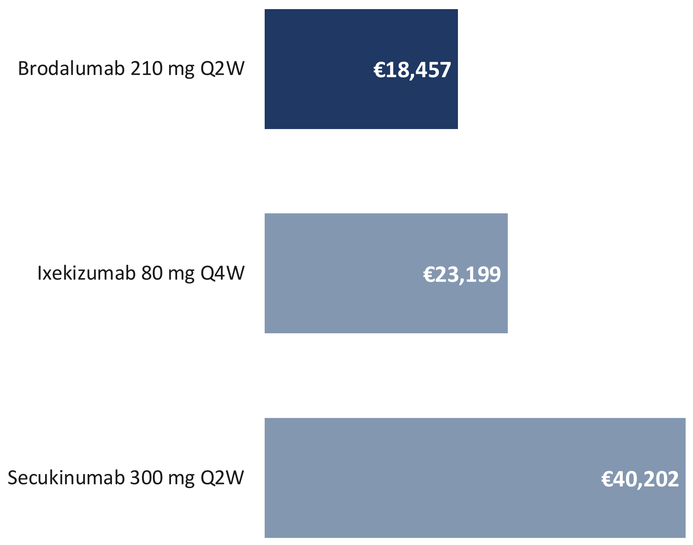
Results

€18,457
lowest cost per PASI 90 responder (brodalumab)

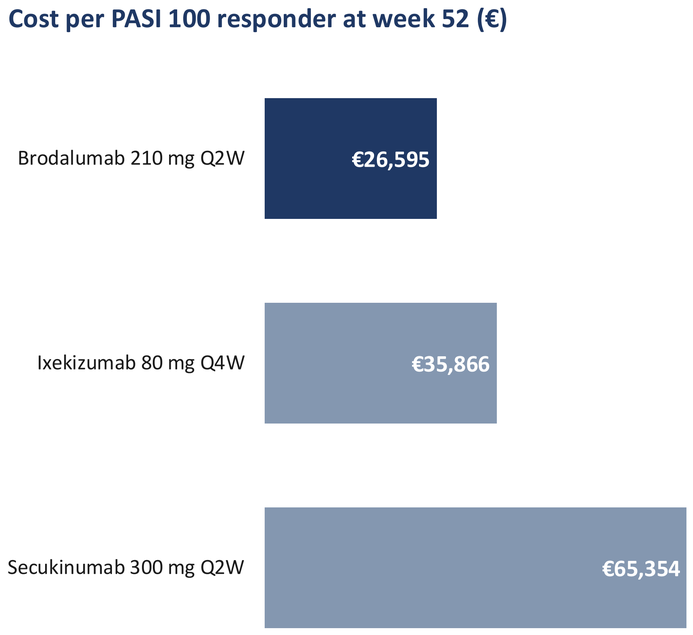
-54%
vs secukinumab 300 mg Q2W per PASI 90 responder

5.4
PASI 90 responders per €100,000 (vs 2.5–4.3)

Cost per PASI 90 responder at week 52 (€, primary outcome)



Cost per PASI 100 responder at week 52 (€)

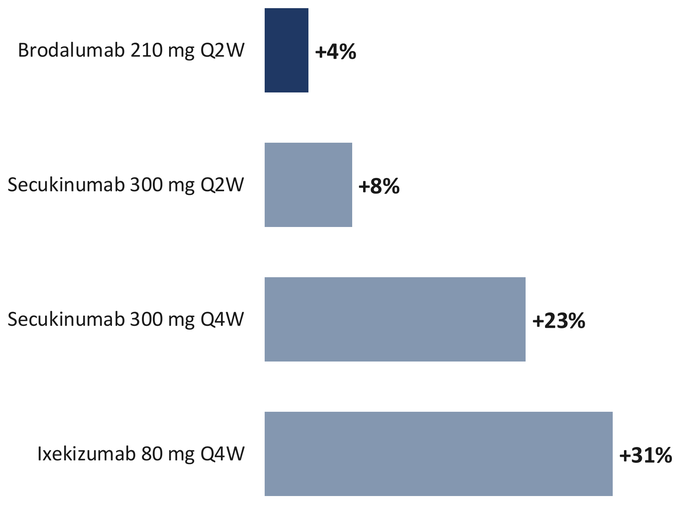


Expected 1-year direct cost per patient (€)

Comparator	Drug	Management	Total	Δ vs BRO
Brodalumab	14,175	150	**14,325**	—
Secukinumab	26,534	168	**26,702**	+12,377
Ixekizumab	16,355	160	**16,516**	+2,191

Drug acquisition accounted for ≥98.9% of expected costs in every arm.

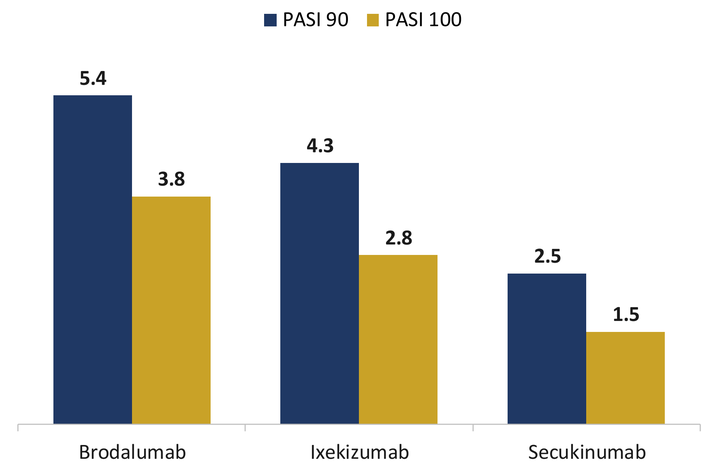
Year-1 (induction) vs year-2 (maintenance) cost



% by which year-1 drug cost exceeds a maintenance year (drug acquisition; same % for cost per patient and per responder, as response is held constant). Fixed dosing keeps brodalumab's year-1 premium at 4%; regimens with heavier induction (secukinumab Q4W, ixekizumab) become relatively cheaper from year 2.

Results (continued)

Responders per €100,000 of NHS spending



Conclusions

- In patients with high body weight, brodalumab had the **lowest expected 1-year cost (€14,325) and the lowest cost per PASI 90 responder (€18,457)** versus secukinumab and ixekizumab in Italy.
- Its advantage is driven by weight-independent dosing and a lower acquisition cost, with a higher PASI 90 response than secukinumab 300 mg Q2W (76.8% vs 66.0%).
- Brodalumab also had the lowest cost per PASI 100 responder (€26,595 vs €65,354 for secukinumab 300 mg Q2W and €35,866 for ixekizumab).
- With fixed dosing, brodalumab's year-1 cost was only 4% above a maintenance year.
- These results may inform biologic selection for heavier patients within the Italian NHS.

Limitations

- Naive cross-trial comparisons: body-weight cut-offs (≥90 to ≥100 kg) and timepoints differ; only brodalumab vs secukinumab was population-adjusted (unanchored MAIC).
- Ixekizumab week-12 response used as a proxy for week 52.
- Ex-factory prices only; confidential discounts, which may change rankings, not included.
- 1-year horizon: regimens with heavier induction become relatively cheaper from year 2; adverse events and second-line switching not modelled; management resource use assumption-based.

References

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