Budget Impact Analysis to Assess Potential Cost Savings From the Introduction of Ustekinumab Biosimilars in Germany, the UK and Sweden

EE15

Andrea Mehl,[1] Abhinav Srivastava[2] and Swathi Malla[2]

[1]Sandoz Global Biopharmaceuticals, Holzkirchen, Germany; [2]Sandoz Private Ltd., Hyderabad, India

BACKGROUND

- Autoimmune diseases are a heterogeneous group of disorders characterised by immune dysregulation and impaired tolerance towards self-antigens.[1]
- Cost burden of autoimmune diseases is expected to increase globally due to higher growth in the affected population.[2] Moreover, countries with a higher sociodemographic index may face a higher cost burden of autoimmune diseases.[3] Studies from European countries such as Germany,[4] the UK[5] and Sweden[6] have reported a substantial burden of autoimmune diseases, e.g.,
  - In Germany, the estimated average annual healthcare costs were €10,097,[7] €5,543[8] and ≥€5,557[9] for patients with Crohn's disease (CD), psoriasis (PsO) and psoriatic arthritis (PsA), respectively.
  - In the UK, the average annual healthcare costs were approximately €7,249 (£6,156),[10] approximately €1,120 (£991)[11] and approximately €5,332 (£3,870)[12] for patients with CD, PsO and PsA, respectively.
  - In Sweden, the mean annual healthcare costs were ≥€12,158,[13] €8,931 and €17,550[14] for patients with CD, PsO alone and PsO with PsA, respectively.
- In some cases, total annual costs were reported to further increase, e.g., in patients with PsO having higher disease severity, the estimated average annual costs were €24,062 (DE)[15], approximately €17,902 (£14,255, UK)[16] and approximately €14,543 ($19,320, SE)[17]
- Ustekinumab, a fully human monoclonal antibody, is an approved biologic for the management of autoimmune diseases, including CD, PsO and PsA.[18] It targets the p40 subunit of pro-inflammatory cytokines interleukin (IL)-12 and IL-23 antagonising the associated key pathways.[19]
- In 2024, reference ustekinumab lost the patent exclusivity.[20] It is expected that the entry of ustekinumab biosimilars will reduce the current high treatment costs[21,22] for patients treated with reference ustekinumab.
- Until June 2024, three biosimilars of ustekinumab have been approved by the European Commission: Pyzchiva® (Sandoz/Samsung Bioepis), Uzpruvo® (Stada/Alvotech) and Wezenla® (Amgen).[23]
- As of June 2024 ustekinumab biosimilars have been approved for the treatment of patients with CD, PsO and PsA. Ulcerative colitis is under patent protection and therefore, ustekinumab biosimilars are not licensed and should not be used to treat ulcerative colitis in Europe.

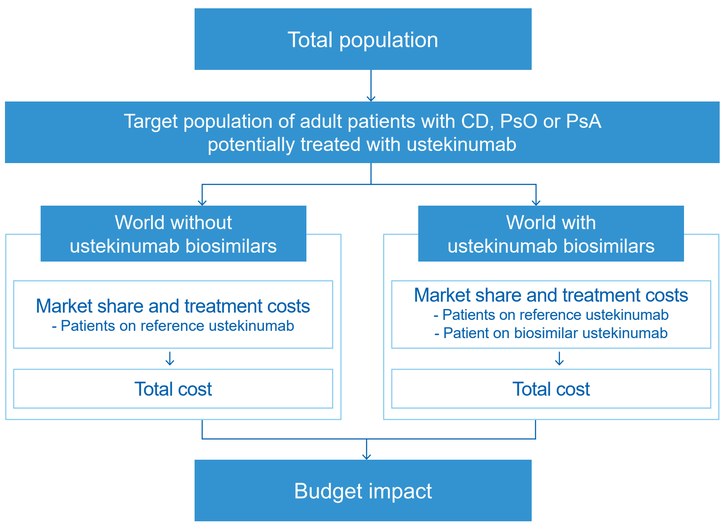
OBJECTIVE

This analysis aimed to assess the cost-saving potential of the introduction of ustekinumab biosimilar from a payer's perspective in Germany, the UK and Sweden for adult patients with CD, PsO and PsA potentially treated with reference ustekinumab.

METHODS

- To analyse the budget impact of the introduction of ustekinumab biosimilar, budget impact models (BIMs) have been separately developed for Germany, the UK and Sweden using Microsoft Excel (version 2407).
- For each country, BIMs estimated and compared the healthcare costs between two scenarios, i.e., 'world without ustekinumab biosimilars' and 'world with ustekinumab biosimilars' over a three-year period using the following model structure (Figure 1) and parameters.

Figure 1: Model structure



CD, Crohn's disease; PsA, psoriatic arthritis; PsO, psoriasis

Target population

- For each country, indication-level eligible patient pool estimates (2024) were derived using: respective mid-year country populations for 2022 and applied previous year growth rates for subsequent years.[24] Further, disease prevalence,[25–27] incidence[26–28] and disease severity proportions (moderate to severe CD,[29] moderate to severe PsO[30] or active PsA[31]) had been applied.
- Further, to calculate the target pool for biosimilar ustekinumab, the indication-level market share proportion of reference ustekinumab was separately applied to the eligible patient pool, based on paid research, internal and key opinion leader (KOL) assumptions.

Market share

- The annual share uptake of ustekinumab biosimilars over time was based on the adalimumab biosimilar analogue in respective countries. Hence, in base case for Germany, the UK and Sweden BIMs, the peak market share of biosimilar ustekinumab at Year 3 was considered to be 72% (DE), 81% (UK) and 65% (SE).

Dosing

- To derive the annual cost of therapy for new and maintenance cases treated with ustekinumab, the following annual dosing regimen was considered based on the product label[32], as shown in the table.

Table: Inputs for ustekinumab annual dose calculation by indication

Disease	Loading year**	Maintenance year
CD*	Vial: 3.00 units Prefilled syringe: 3.67 units	Prefilled syringe: 4.33 units
PsO/PsA*	Prefilled syringe: 6.00 units	Prefilled syringe: 4.33 units

CD, Crohn's disease; PsA, psoriatic arthritis; PsO, psoriasis.
*Above dose calculations were based on mean body weight of 70.8 kg (CD)[33] and 80.0 kg (PsO/PsA)[34]
**5% of cases were expected to be new to the treatment.

Costs

- Drug cost of reference ustekinumab in respective countries was based on the list price (NHS Business Services Authority [NHSBSA] (UK), Rote Liste [DE] and Tandvårds-Läkemedelsförmånsverket [SE]); June 2024).
- Constant ustekinumab biosimilar drug cost has been estimated using adalimumab analogue, which indicates that in three years adalimumab biosimilar list price were reduced by 45% (DE), 9% (UK), and 69% (SE), compared to the pre loss of exclusivity list price of reference adalimumab.
- Other costs (e.g., administration costs and cost of adverse events) were assumed to be the same in both scenarios and hence were not incorporated in the model.

Sensitivity analysis

- The costs of ustekinumab biosimilars were based on the list price and analogue-based discounts, which might not reflect the true cost. Moreover, in all three healthcare systems, tenders and contracts determine additional discounts for biosimilars that are beyond the published list price. Hence, a sensitivity analysis was performed to assess the potential savings applying various discount levels in comparison to the list price of reference ustekinumab.
- In addition, different scenarios for biosimilar uptake were assessed.

RESULTS

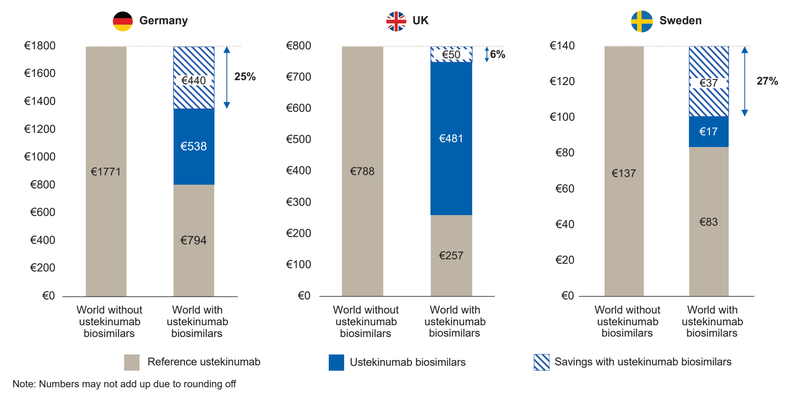
Overall budget impact in base case scenario

- Total savings of €440.0 million in Germany, €49.5 million (approximately £41.7 million) in the UK and €36.8 million (approximately Kr 414.6 million) in Sweden were estimated over three years for the target population (Figure 2).
- With the use of ustekinumab biosimilars in the target population, the overall budget was estimated to reduce by 25% (DE), 6% (UK) and 27% (SE) over three years. Differences in impact between the countries are mainly influenced by the price discount levels.
- Savings were estimated to increase from Year 1 to Year 3 across the targeted countries due to an increase in biosimilar penetration in the markets, as shown in Figure 3.

Patient-level savings

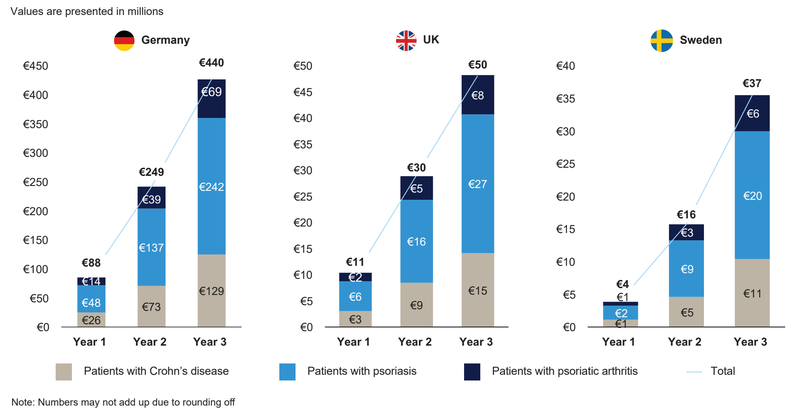
- The patient-level annual average saving estimates were €5,167 in Germany, €709 (approximately £597) in the UK and €3,388 (approximately Kr 38,137) in Sweden. There are only minor differences between gastrointestinal and dermatology indications (Figure 4).

Figure 2: Cumulative budget impact



Note: Numbers may not add up due to rounding off

Figure 3: Cumulative budget savings by indication



Note: Numbers may not add up due to rounding off

Figure 4: Country level average annual savings per patient

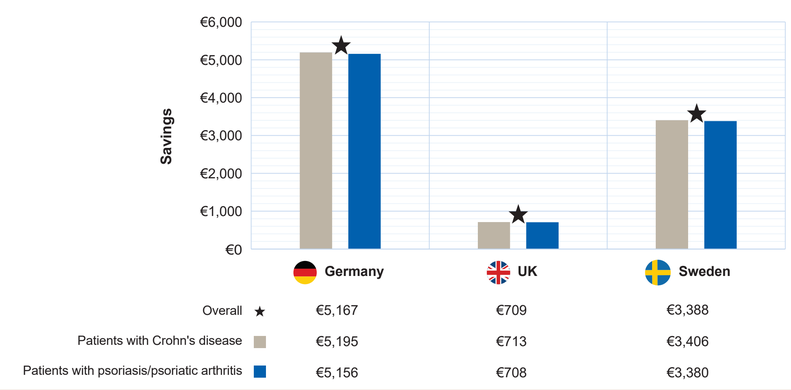
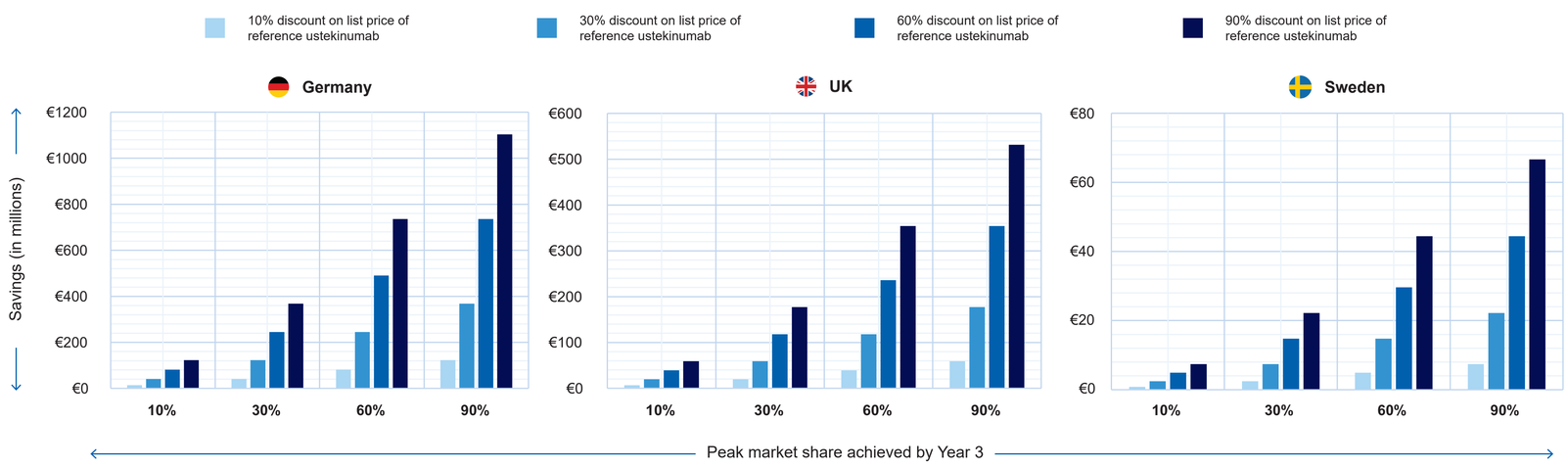


Figure 5: Scenarios for budget savings with the use of ustekinumab biosimilars: Pricing vs. market share



Sensitivity analysis

- Sensitivity analysis revealed that higher penetration of biosimilars will proportionally reduce the treatment cost burden in all three countries (Figure 5). Similarly, savings will be more if biosimilars are available at more discounted prices. Moreover, the following outcomes were observed in the worst and best case scenarios:
  - Worst case scenario (i.e. 10% peak market share at Year 3 and constant 10% price reduction): the estimated savings were €14 million in Germany, €7 million in the UK and €0.8 million in Sweden, respectively.
  - Best case scenario (i.e. 90% peak market share at Year 3 and constant 90% price reduction): the estimated savings were €1,103 million in Germany, €531 million in the UK and €67 million in Sweden, respectively.

Notes and limitations

- Above calculations were based on assumptions that patients maintained 100% compliance with treatment and all patients started treatment at the beginning of the year.
- In this analysis, for calculating the indication level target patient pools, "share of patients currently treated with reference ustekinumab" have been applied which was based on internal inputs. Further, these values might differ at a local level.
- BIMs did not consider the cost-saving potential for ulcerative colitis indication since this indication is protected by the patent of the reference medicine.
- BIMs did not include ustekinumab dose escalation scenarios, although it is likely to occur in approximately 20% of patients with CD[35] and 3%-37% of patients with PsO[36]. Savings associated with the use of ustekinumab biosimilars in an escalated dosing regimen remain to be explored in future analyses.

CONCLUSIONS

- Introduction of ustekinumab biosimilars is anticipated to achieve substantial savings over three years across Germany (€440.0 million), the UK (€49.5 million) and Sweden (€36.8 million). Moreover, savings potential could increase considerably with an increase in ustekinumab biosimilar uptake or ustekinumab biosimilars offered at more discounted prices.
- Adoption of ustekinumab biosimilars therefore represent a great opportunity to reduce the budgetary pressures for payers, supporting the sustainability of healthcare systems, potentially allowing more patients access to treatment.

References

1. Pisetsky DS. Nat Rev Nephrol. 2023;19:509–524.
2. Miller FW. Curr Opin Immunol. 2023;80:102266.
3. Cao F, et al. Autoimmun Rev. 2023;22:103326.
4. Holstiege J, et al. Central Research Institute for Ambulatory Health Care in Germany (Zi). https://www.versorgungsatlas.de/fileadmin/ziva_docs/117/VA_21-03_Abstract_en-Biologika_2021-05-06.pdf . Accessed Oct 2024.
5. Conrad N, et al. Lancet. 2023;401:1878–1890.
6. Danielsen K, et al. Acta Derm Venereol. 2019;99:18–25.
7. Wilke T, et al. Clin Ther. 2020;42:130–143.e3.
8. Jungen D, et al. J Eur Acad Dermatol Venereol. 2018;32:174–180.
9. Jacob C, et al. Value in Health. 2016;19:A566.
10. Ghosh N, et al. Frontline Gastroenterol. 2015;6:169–174.
11. Ng'ambi PG. https://research.manchester.ac.uk/en/studentTheses/quantifying-the-economic-impact-of-psoriasis. Accessed Oct 2024.
12. McHugh N, et al. J Rheumatol. 2020;47:701–707.
13. Everhov ÅH, et al. Aliment Pharmacol Ther. 2023;58:692–703.
14. Löfvendahl S, et al. J Rheumatol. 2016;43:640–647.
15. Mahlich J, et al. Adv Ther. 2019;36:1684–1699.
16. Fonia A, et al. Br J Dermatol. 2010;163:807–816.
17. Svedbom A, et al. Acta Derm Venereol. 2016;96:651–657.
18. Prieto-Peña D, Dasgupta B. Pol Arch Intern Med. 2021;131:171–181.
19. Koutruba N, et al. Ther Clin Risk Manag. 2010;6:123–141.
20. Specialist Pharmacy Service. https://www.sps.nhs.uk/articles/preparing-to-use-ustekinumab-biosimilar/. Accessed Oct 2024.
21. Gemeinsamer Bundesausschuss. https://www.g-ba.de/downloads/40-1465-9559/2023-06-15_AM-RL-XII_Risankizumab_D-892_TrG_EN.pdf. Accessed Oct 2024.
22. Blauvelt A, et al. J Manag Care Spec Pharm. 2021;27:84–94.
23. GaBi Online. https://www.gabionline.net/biosimilars/general/biosimilars-approved-in-europe. Accessed Oct 2024.
24. United Nations Statistics Division. https://data.un.org. Accessed Oct 2024.
25. Jones GR, et al. Gut. 2019;68:1953–1960.
26. Parisi R, et al. BMJ. 2020;369:m1590.
27. Druce KL, et al. Rheumatology (Oxford). 2023:kead586.
28. Pasvol TJ, et al. BMJ Open. 2020;10:e036584.
29. Clinical Trials Arena. https://www.clinicaltrialsarena.com/comment/majority-crohns-disease-either-mild-moderately-severe/. Accessed Oct 2024.
30. Langan SM, et al. J Invest Dermatol. 2012;132:556–562.
31. Ogdie A, et al. Ann Rheum Dis. 2015;74:326–332.
32. Stelara SmPC. https://www.ema.europa.eu/en/documents/product-information/stelara-epar-product-information_en.pdf. Accessed Oct 2024.
33. Sandborn WJ, et al. Inflamm Bowel Dis. 2021;27:994–1007.
34. Elberdín L, et al. Front Med (Lausanne). 2022;9:1017323.
35. Meserve J, et al. Clin Gastroenterol Hepatol. 2022;20:2728–2740 e1.
36. Gambardella A, et al. Dermatol Ther (Heidelb). 2021;11:1141–1156.

Acknowledgement: The authors would like to thank Gopinath (Indegene Ltd.) for designing the poster layout.
Funding: This study was funded by Sandoz International GmbH.