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ORIGINAL RESEARCH

Budget Impact of Secukinumab in Psoriatic Arthritis Patients with Contraindication to TNF-Alpha Inhibitors

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Background: Secukinumab, an IL-17A inhibitor, has been recommended for psoriatic arthritis (PsA) patients with contraindications to TNF-alpha inhibitors (TNFi). However, its budgetary implications in Thailand remain unclear.

Objective: To estimate the 5-year budget impact of introducing secukinumab 150 mg for PsA patients contraindicated to TNFi therapy from the perspective of the Thai healthcare system.

Methods: A budget impact analysis (BIA) was developed following the Thai HTA Guideline. Two treatment scenarios were compared: the current standard of care using csDMARDs and a new scenario incorporating secukinumab 150 mg (auto-injector). The model estimated eligible patients based on national demographics and clinical data. Costs included direct medical costs for medications, administration, monitoring, and complications. Net budget impact (NBI) was estimated. Deterministic sensitivity analyses were conducted to evaluate the impact of varying uptake rates and treatment durations.

Results: Under the base-case scenario over five years, secukinumab use resulted in the NBI of 15.14 million THB (434,965 USD), with an average annual net budget impact of 3.03 million THB (86,993 USD). Drug acquisition accounted for 97.16% of the total budget impact. Sensitivity analyses revealed a higher financial burden with increased uptake or lifetime treatment but remained within a manageable range (up to 18.34 million THB or 526,849 USD).

Conclusion: Introducing secukinumab for PsA patients contraindicated to TNFi is associated with a moderate increase in healthcare expenditure. These findings suggest that inclusion of secukinumab in the National List of Essential Medicines for this specific population may be feasible, conditional on successful price negotiation and/or managed entry arrangements to ensure budgetary sustainability and equitable access.

Plain Language Summary: This study evaluated the 5-year budget impact of introducing secukinumab, an interleukin-17A inhibitor, for psoriatic arthritis (PsA) patients contraindicated to TNF-alpha inhibitors (TNFi) in Thailand. A budget impact analysis was developed in accordance with the Thai Health Technology Assessment (HTA) Guideline, comparing the current standard of care with conventional DMARDs (csDMARDs) against a new scenario incorporating secukinumab 150 mg (auto-injector). Eligible patient numbers were estimated using national demographic and clinical data, while direct medical costs included medications, administration, monitoring, and treatment of complications.

Results showed that introducing secukinumab led to a net budget impact (NBI) of 15.14 million THB (434,965 USD) over five years, averaging 3.03 million THB (86,993 USD) annually. Drug acquisition accounted for 97% of the increased expenditure. Sensitivity analyses indicated that higher uptake rates or lifetime treatment duration moderately increased costs but remained within a manageable range (up to 18.34 million THB or 526,849 USD).

The findings suggest that while secukinumab adoption modestly increases healthcare costs, it provides a valuable therapeutic alternative for PsA patients who cannot use TNFi. Policy implications include supporting its inclusion in Thailand's National List of Essential Medicines with price negotiation strategies to ensure affordability and access.

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Introduction

Budget impact analysis (BIA) is a key component of health technology assessment (HTA) used to estimate the financial consequences of adopting new health interventions. It supports decision-makers in determining whether to include expensive medications in national formularies or benefit packages under universal health coverage systems. In Thailand, BIA is often conducted alongside cost-effectiveness analysis to inform reimbursement decisions for high-cost treatments.[1]

Psoriatic arthritis (PsA) is a chronic inflammatory arthropathy associated with psoriasis and belongs to the spondyloarthropathy group. It is the second most common inflammatory arthritis after rheumatoid arthritis. Epidemiological data indicate an incidence of 2–23 cases per 100,000 person-years and a prevalence of 56–1,500 per 100,000 people in Europe and North America.[2] The disease burden varies and may lead to permanent joint damage and disability, significantly reducing patients' quality of life and imposing a socioeconomic burden.[3,4] Treatment goals include controlling both skin and joint symptoms. Initial therapy may involve non-steroidal anti-inflammatory drugs (NSAIDs) or intra-articular corticosteroids. For patients with more extensive joint involvement or inadequate response to NSAIDs, conventional disease-modifying anti-rheumatic drugs (cDMARDs) such as methotrexate, sulfasalazine, leflunomide, and cyclosporine are recommended.[5] In patients with severe disease or failure of cDMARDs, biologic DMARDs (bDMARDs) are indicated. TNF-alpha inhibitors (TNFi), such as adalimumab, are commonly used as first-line biologics in Thailand and are listed under the National List of Essential Medicines (NLEM) with specific prescription criteria.[6]

Nevertheless, some patients are contraindicated for TNFi therapy. At present, there are no alternative bDMARDs listed in the NLEM for this group. Secukinumab, a selective interleukin-17A inhibitor (IL-17Ai), has been strongly recommended for this patient group by both the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) and the European Alliance of Associations for Rheumatology (EULAR) for treating all PsA manifestations.[7,8] Recent pharmacoeconomic research in Thailand assessed the cost-utility of TNF-alpha inhibitors (TNFi), secukinumab, and apremilast in patients with moderate to severe psoriatic arthritis (PsA) who were TNFi-naïve. Among these treatments, secukinumab 150 mg was the only option found to be cost-effective, with an incremental cost-effectiveness ratio (ICER) of 88,046 THB per quality-adjusted life year (QALY) gained—well below the national willingness-to-pay threshold of 160,000 THB per QALY.[9] However, a budget impact analysis specifically focused on the use of secukinumab 150 mg in patients with contraindications to TNFi therapy has not yet been conducted.

Accordingly, this study aims to evaluate the budget impact of secukinumab 150 mg (powder for solution or auto-injector) for PsA patients contraindicated for TNFi therapy, from the Thai payer's perspective. Since only the auto-injector formulation is expected to remain available in Thailand, the analysis focuses on that format. The study also draws on clinical and economic data from the aforementioned cost-effectiveness analysis to support policy deliberations.

Methods

Budget Impact Model Overview

A budget impact analysis was conducted from the Thai healthcare system (payer's) perspective to assess the financial implications of introducing secukinumab 150 mg for the treatment of patients with psoriatic arthritis (PsA), compared with the current standard treatment regimen (cDMARD-based regimen). The model was designed to estimate the budgetary impact on Thailand's healthcare system over a 5-year time horizon. This analysis was performed in accordance with the Thai Health Technology Assessment (HTA) Guideline,[2] which is informed by international good-practice recommendations for BIA (eg, the ISPOR BIA Task Force), and was reported with reference to the CHEERS 2022 reporting principles (Table S1).

Expert Consensus Process

Expert consensus was used to validate model inputs when Thai published evidence or routinely accessible administrative data were unavailable. A panel of 4 Thai rheumatologists and 2 pharmacoeconomists/HTA experts reviewed and agreed on: (i) the cDMARD combination regimens and doses; (ii) the secukinumab treatment pathway (monotherapy vs combination with methotrexate); (iii) treatment duration assumptions (3-year continuation among responders and post–3-year discontinuation proportions); and (iv) aged of eligible population. Consensus was reached through two structured meetings and iterative feedback rounds. Disagreements were resolved by discussion until a majority agreement was achieved, and final inputs were documented.

Treatment Scenarios

Drug dosing and treatment assumptions were presented in Table S2 section A. Two treatment scenarios were evaluated in the model. The current scenario comprised a combination of two treatment regimens with an equal distribution of patients (50%) assigned to each. The first regimen included methotrexate 7.5 mg/week, leflunomide 10 mg/day, and ciclosporin 3 mg/kg/day, while the second composed of methotrexate 7.5 mg/week, leflunomide 10 mg/day, and sulfasalazine 2 g/day. These selected dosing regimens reflect commonly used starting/maintenance doses in Thailand for patients requiring csDMARD combination therapy based on the Thai clinical practice guidance for PsA management,[5] and cross-checked against routine dosing used in Thai tertiary-care rheumatology practice through expert consensus.

The new scenario incorporated the use of secukinumab at a dose of 150 mg monthly, following an initial loading dose of 150 mg/week for the first month. According to data from the Rheumatic Disease Prior Authorization (RDPA) program in Thailand, 17% of patients received secukinumab as monotherapy, while the remaining 83% received secukinumab in combination with methotrexate. Patients who responded to secukinumab continued treatment for three years. After this period, 55% remained on secukinumab in combination with methotrexate, while the remaining 45% discontinued secukinumab and continued with methotrexate alone. This treatment pathway was based on the expert consensus process described above.

The uptake of secukinumab over a 5-year time horizon was based on the Ministry of Public Health data. Between 2017 and 2020, approximately 1,000–1,400 PsA patients accessed bDMARDs, with 1,423 patients treated in 2020. Given an estimated PsA population of 7,508, this represents a 20% accessibility rate. Therefore, this BIA model assumed a 20% uptake of secukinumab in year 1, increasing by 10% points annually, reaching 60% by year 5.

Eligible Population Estimates

The eligible population in this study was patients with PsA who were contraindicated to anti-TNF drugs (Figure 1). The eligible population was restricted to individuals aged ≥40 years because the average age of Thai patients with PsA is approximately 40 years,[10] TNFi contraindications, and comorbidities (eg, tuberculosis and malignancy) were primarily available and most reliable for this age group in Thailand. Due to the limited availability of local epidemiological data, the prevalence and incidence rates of PsA were obtained from the meta-analysis study, which reported a prevalence of 0.113% and an incidence of 0.083%.[11] To date, about 21.43% of PsA patients in Thailand have been treated with bDMARDs, while 78.57% continue receiving cDMARDs or NSAIDs. According to primary data collection from Siriraj hospital, the largest university tertiary hospital in Thailand, 25.30% of PsA patients receiving cDMARDs experienced treatment failure and required anti-TNF therapy. However, a proportion of these patients were contraindicated to anti-TNF treatment due to comorbid tuberculosis or cancer, with prevalence of 0.002 and 0.006, respectively.[12,13] Based on the Thai population aged ≥40 years, estimated at 33,424,859 individuals, the number of PsA patients who failed cDMARD treatment and were contraindicated to anti-TNF drugs was estimated to be 63. Additionally, the number of new incident cases in this group was estimated at 25 (Table S3).

Healthcare Costs

In line with the Thai HTA Guideline,[2] this study adopted a healthcare system perspective. The analysis included undiscounted direct medical costs, comprising the costs of secukinumab 150 mg, cDMARDs, drug administration, laboratory monitoring, and treatment of complications. Since the majority of patients receiving secukinumab continued to use methotrexate,

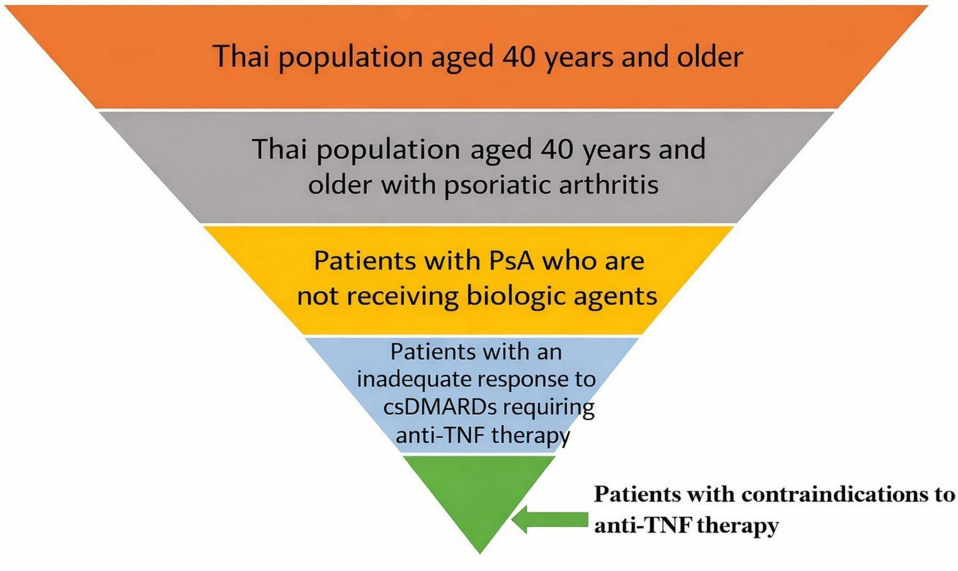

Figure 1 Eligible population.

consistent with the current treatment scenario, the complication costs associated with the current scenario were excluded from the analysis. Only the complication costs associated with secukinumab treatment were considered. Details of unit costs, adherence, and wastage assumptions were provided in Table S2 section B-C. Adverse event rates for secukinumab were derived from published clinical trials reflecting real-world use, predominantly in combination with methotrexate. No additional adverse-event costs for methotrexate were added separately in the secukinumab arm to avoid double-counting. The adverse events were used to estimate the cost of adverse events related to the secukinumab arm (Table S4).

Annual costs for each cost component were obtained from a previously published economic evaluation.[9] All cost data were adjusted for inflation based on the medical care section of Thailand's consumer price index in 2023.[14] The costs were converted into USD at a rate of 34.81 Thai baht (THB). The details are provided in Table 1.

Table 1 Annual Cost Inputs

Cost Items	Costs Per Year [THB (USD)]				
	Year 1	Year 2	Year 3	Year 4	Year 5
New scenario (secukinumab 150 mg)					
- Medications	82,223 (2,362)	57,007 (1,638)	56,704 (1,629)	44,332 (1,274)	44,096 (1,267)
- Drug administration and laboratory monitoring	49,264 (1,415)	47,384 (1,361)	47,132 (1,354)	46,880 (1,347)	46,631 (1,340)
- Treatment complications	52 (2)	48 (1)	47 (1)	26 (1)	26 (1)
Current scenario (standard treatment)					
- Medications	30,096 (865)	29,936 (860)	29,776 (855)	29,618 (851)	29,460 (846)
- Drug administration and laboratory monitoring	49,264 (1,415)	47,384 (1,361)	47,132 (1,354)	46,880 (1,347)	46,631 (1,340)

Base-Case Analysis and Sensitivity Analysis

The base-case analysis was performed over a 5-year time horizon. Total expenditures for both the current scenario (standard treatment) and new scenario (secukinumab) were estimated by multiplying the number of eligible patients by the respective treatment costs. The net budget impact (NBI) was calculated as the difference in total costs between the new and current scenarios using the following formula:

NBI = [(eligible population x % uptake of secukinumab x total cost of secukinumab treatment) + (eligible population x (1 - % uptake) x total cost of standard of care)] – (eligible population x total cost of standard of care).

To test the robustness of the results, a series of sensitivity analyses were conducted: (1) varying the uptake rate of secukinumab, (2) assuming all patients continue secukinumab treatment for their lifetime, and (3) modifying the proportion of patients with inadequate response to cDMARDs.

Results

In the base-case analysis, introducing secukinumab with an initial uptake of 20% in the first year, followed by a 10% annual increase to reach 60% in Year 5, resulted in a higher overall 5-year compared to the current scenario (67,082,471 THB vs 51,941,328 THB, or 1,927,103 USD vs 1,492,138 USD). This led to the NBI of 15,141,143 THB (434,965 USD). The average annual budget for the new scenario was 13,416,494 THB (385,421 USD), compared to 10,388,266 THB (298,428 USD) for the current scenario, resulting in an annual NBI of 3,028,229 THB (86,993 USD) (Table 2). Of the total NBI, 97.16% was attributable to the cost of biologic agent (Figure 2).

Table 2 Base-Case Results

Year	Cost Items	Budget [THB (USD)]		Net Budget Impact [THB (USD)]
		New Scenario (Secukinumab)	Current Scenario (Standard Treatment)	
1	Total Medications Administration Complications	7,885,321 (226,525) 3,558,358 (102,222) 4,326,042 (124,276) 921 (26)	6,968,915 (200,199) 2,642,873 (75,923) 4,326,042 (124,276) N/A	916,406 (26,326) 915,486 (26,300) – 921 (26)
2	Total Medications Administration Complications	10,648,899 (305,915) 5,296,428 (152,152) 5,350,160 (153,696) 2,310 (66)	8,643,254 (248,298) 3,346,393 (96,133) 5,296,861 (152,165) N/A	2,005,645 (57,617) 1,950,035 (56,019) 53,299 (1,531) 2,310 (66)
3	Total Medications Administration Complications	13,612,386 (391,048) 7,144,883 (205,254) 6,463,470 (185,679) 4,033 (116)	10,409,439 (299,036) 4,030,203 (115,777) 6,379,236 (183,259) N/A	3,202,946 (92,012) 3,114,679 (89,477) 84,234 (2,420) 4,033 (116)
4	Total Medications Administration Complications	16,286,338 (467,864) 8,730,917 (250,816) 7,549,924 (216,890) 5,497 (158)	12,125,906 (348,345) 4,694,765 (134,868) 7,431,141 (213,477) N/A	4,160,433 (119,518) 4,036,152 (115,948) 118,783 (3,412) 5,497 (158)
5	Total Medications Administration Complications	18,649,527 (535,752) 10,034,639 (288,269) 8,608,238 (247,292) 6,650 (191)	13,793,815 (396,260) 5,340,526 (153,419) 8,453,289 (242,841) N/A	4,855,713 (139,492) 4,694,113 (134,850) 154,949 (4,451) 6,650 (191)

(*Continued*)

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Table 2 (Continued).

Year	Cost Items	Budget [THB (USD)]		Net Budget Impact [THB (USD)]
		New Scenario (Secukinumab)	Current Scenario (Standard Treatment)	
5 years	**Total** Medications Administration Complications	**67,082,471 (1,927,103)** 34,765,225 (998,714) 32,297,834 (927,832) 19,412 (558)	**51,941,328 (1,492,138)** 20,055 (576,121) 31,887 (916,017) N/A	**15,141,143 (434,965)** 14,710,465 (422,593) 411,265 (11,815) 19,412 (558)
Average	**Total** Medications Administration Complications	**13,416,494 (385,421)** 6,953,045 (199,743) 6,459,567 (185,566) 3,882 (112)	**10,388,266 (298,428)** 4,010,952 (115,224) 6,377,314 (183,203) N/A	**3,028,229 (86,993)** 2,942,093 (84,519) 82,253 (2,363) 3,882 (112)

Note: N/A = Data is not available.

When the treatment duration of secukinumab was extended from three years to lifetime, the NBI began to rise from year 4 onward. The overall 5-year NBI increased slightly from 434,965 USD (base-case) to 455,781 USD (Figure 3A and B).

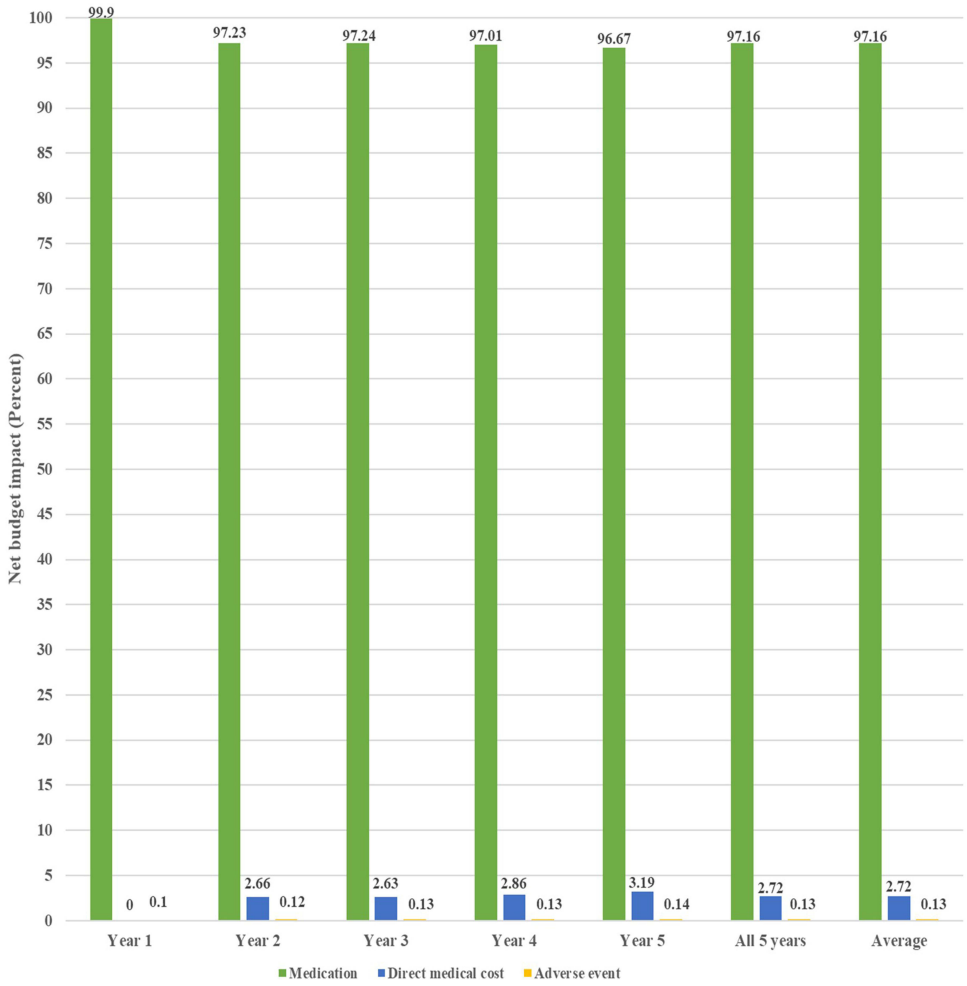

Figure 2 Cost contribution for net budget impact.

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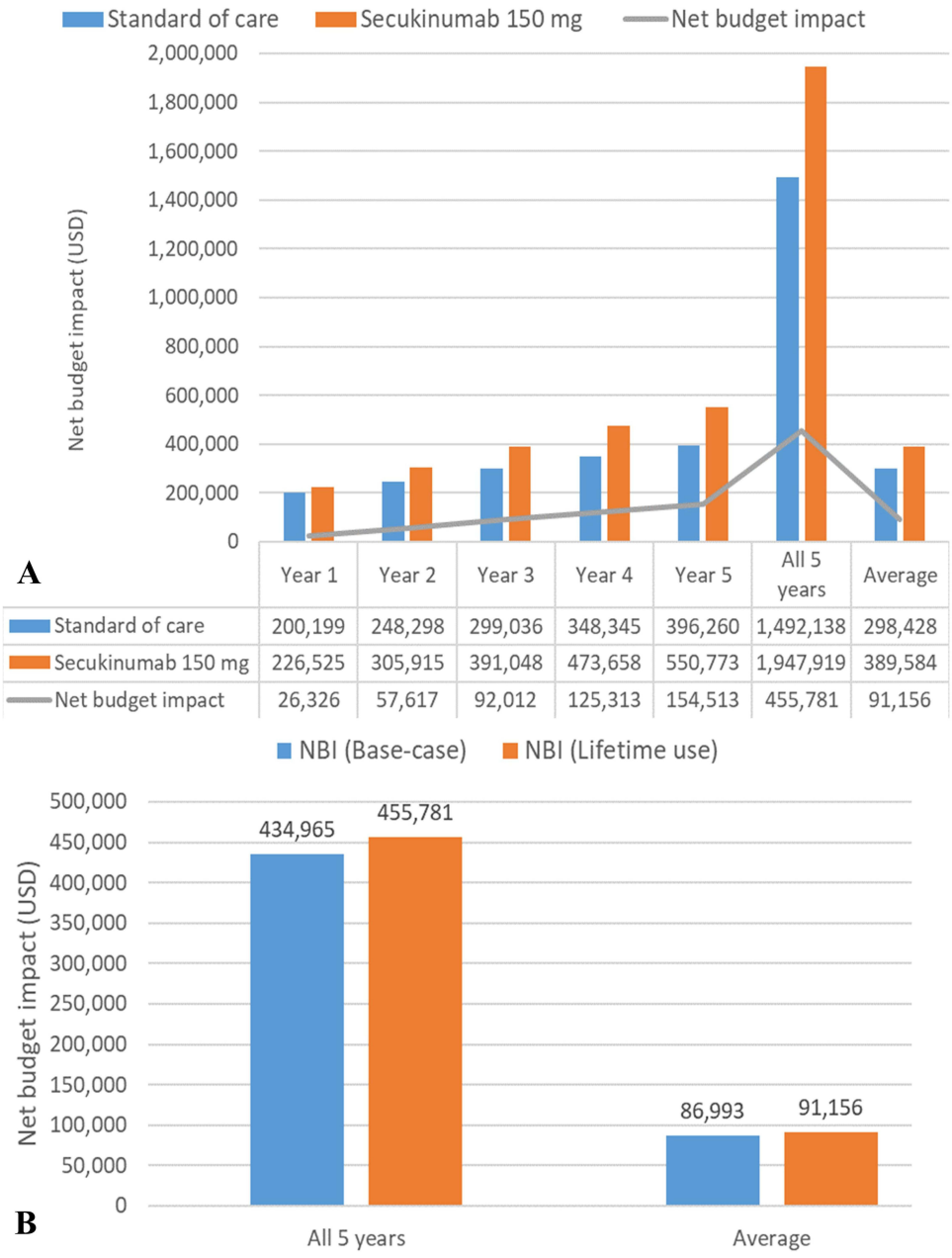

Figure 3 Scenario analysis results by; (**A**) Net budget impact (NBI) for each year and (**B**) assuming all patients continuously receive secukinumab for their lifetime.

Varying the uptake rate of secukinumab from 5% to 50%, while keeping the cost of biologic as in the base case, resulted in a 5-year NBI ranging from 2.96 million THB (84,956 USD) to 16.95 million THB (486,879 USD). Under the lifetime treatment scenario, the 5-year NBI ranged from 3.12 million THB (89,594 USD) to 18.34 million THB (526,849 USD) as shown in Table 3. The upper-bound estimate of the net budget impact observed in the sensitivity analysis corresponds to the lifetime treatment scenario combined with the highest uptake assumption, representing a conservative worst-case scenario.

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Table 3 Net Budget Impact (NBI) of Sensitivity Analysis by Varying the Uptake Rate and Treatment Duration of Secukinumab

Uptake Rate/Treatment Scenario	3-Year Treatment of Secukinumab		Lifetime Treatment of Secukinumab	
	Total 5 Years NBI	Average NBI	Total 5 Years NBI	Average NBI
5%	2,957,315	591,463	3,118,758	623,752
10%	5,535,941	1,107,188	5,853,870	1,170,774
15%	7,778,664	1,555,733	8,248,123	1,649,625
20%	9,724,648	1,944,930	10,340,678	2,068,136
25%	11,409,598	2,281,920	12,167,244	2,433,449
30%	12,865,938	2,573,188	13,760,243	2,752,049
35%	14,122,977	2,824,595	15,148,984	3,029,797
40%	15,207,080	3,041,416	16,359,833	3,271,967
45%	16,141,840	3,228,368	17,416,381	3,483,276
50%	16,948,247	3,389,649	18,339,618	3,667,924

Abbreviations: NBI, Net budget impact; Upper-bound values reflect the lifetime treatment scenario under the maximum uptake assumption.

Discussion

This BIA evaluated the financial implications of introducing secukinumab 150 mg for patients with PsA contraindicated to anti-TNF therapies within the Thai healthcare system. The results indicated that incorporating secukinumab 150 mg into the treatment regimen would result in a moderate increase in healthcare expenditure over a 5-year time horizon compared to the current standard of care using with csDMARDs.

In the base-case scenario, where secukinumab uptake was projected to increase from 20% in year 1 to 60% by year 5, the overall NBI was estimated at 15.14 million THB (434,965 USD). The majority of this incremental cost (97.16%) was attributable to the acquisition of the secukinumab drug. These findings differ from studies conducted in Italy and France, where secukinumab was reported to be a cost-saving option for PsA treatment.[15–17] Several factors may explain this discrepancy. First, the cost of csDMARDs in Thailand is significantly lower than in Western countries, thereby widening the cost gap between current treatment and biologics. Second, the target population in this study was more narrowly defined, focusing only on patients contraindicated to anti-TNF therapies, resulting in a smaller eligible population and thus a lower potential offset of costs. Third, the analysis did not include adverse event-related costs in the current scenario, as secukinumab use was still largely combined with methotrexate.

A key strength of this study lies in its adherence to established good-practice principles for budget impact analysis, including transparent specification of the eligible population, a 5-year time horizon consistent with Thai HTA Guidelines, explicit assumptions regarding treatment uptake, and use of undiscounted annual budget estimates, and the incorporation of real-world data from the RDPA database and local clinical expert input. These elements are consistent with recommendations from the ISPOR Budget Impact Analysis Task Force and the CHEERS 2022 reporting framework, thereby enhancing the transparency and policy relevance of the findings.

However, a few limitations should be acknowledged. First, local epidemiological data specific to PsA and TNFi contraindication remain limited. The BIA relied on epidemiological data, uptake assumptions, and clinical data that, in some cases, were unavailable for the Thai context. When local data were not available, inputs were based on data from international literature or expert consensus. Nonetheless, sensitivity analyses were performed to test the robustness of the findings under alternative assumptions, including changes in uptake rates and duration of secukinumab treatment. These analyses help to inform budget planning by illustrating the potential fiscal impact under different scenarios. Second, indirect costs and broader societal impacts (eg, productivity loss, caregiver burden) were excluded in accordance with the Thai HTA Guideline[2] for BIA. These may be particularly relevant given PsA's debilitating nature and secukinumab's potential to improve long-term functional outcomes. The inclusion of broader societal costs could potentially alter the cost implications, particularly if secukinumab improves clinical outcomes and reduces disease burden over time. Moreover, the restriction of the eligible population to patients aged ≥ 40 years may limit the generalizability of the

findings to younger patients with psoriatic arthritis. However, given that PsA prevalence, TNFi contraindications, and biologic treatment use increase with age, this assumption is unlikely to bias the estimated budget impact at the population level substantially.

Regarding transferability, although this analysis was conducted from the Thai healthcare system perspective, the findings are likely applicable across major public payers in Thailand, as drug prices, reimbursement mechanisms, and access criteria for biologic therapies are broadly aligned, with differences mainly in utilization management rather than unit costs.

The budget impact was primarily driven by three key cost drivers: drug acquisition costs of secukinumab, assumptions on uptake rates over time, and treatment duration. Among these, biologic drug costs accounted for the largest proportion of incremental expenditure, consistent with findings from international BIAs.

In Thailand, reimbursement policy and formulary listing requirements are likely to influence the real-world budget impact of secukinumab. Access to high-cost biologics commonly depends on inclusion in national formularies and payer utilization management (eg, eligibility criteria, specialist prescribing, and prior authorization). For the subgroup contraindicated to TNFi, the absence of an alternative reimbursed biologic may lead to continued csDMARD use despite inadequate disease control, potentially increasing downstream clinical and economic burden. If secukinumab were listed with clear eligibility criteria for TNFi-contraindicated PsA, uptake could increase faster than assumed, whereas strict prior-authorization requirements or budget caps could slow uptake and reduce short-term budget impact. Managed entry approaches, such as price negotiation, volume-based agreements, or risk-sharing arrangements, could mitigate the dominant driver of incremental cost (drug acquisition), improving affordability while expanding access for this clinically underserved population.

From a policy perspective, these findings suggest that the inclusion of secukinumab in Thailand's National List of Essential Medicines (NLEM) for psoriatic arthritis patients contraindicated to TNF inhibitors may be feasible, conditional upon effective price negotiation and/or the implementation of managed-entry agreements, as commonly applied for high-cost biologic therapies in Thailand. Given the observed budget impact, such mechanisms could help ensure affordability and sustainability within the Thai healthcare system while enabling access for this narrowly defined patient population.

Conclusion

The introduction of secukinumab 150 mg for psoriatic arthritis patients contraindicated to TNF-alpha inhibitors is associated with a moderate net budgetary impact over a five-year period. While short-term expenditures increase primarily due to biologic drug acquisition costs, longer-term budget projections suggest a stable and predictable financial impact. With further evidence on real-world utilization and under appropriate price negotiation or managed-entry arrangements, the potential inclusion of secukinumab in the National List of Essential Medicines for this specific population may be considered.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare that they have no conflicts of interest in this work.

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