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Background

- Psoriasis (PsO) is a common, chronic, relapsing, and immune-mediated disease. The prevalence of PsO in China ranges from 0.05 to 1.23%^{1,2}.
- Traditional topical medications and phototherapy have limited efficacy and are unable to achieve long-term stable control of the disease. However, biologics have significantly improved the treatment for moderate to severe psoriasis³.
- Poor adherence and persistence to prescribed biologic therapies can lead to a substantial decrease in their therapeutic efficacy. The use of different biologics in healthcare resources utilization (HCRU) and costs may affect patients' choice of biologics^{4,5}.
- Data regarding their treatment patterns and economic implications remain scarce, impeding clinical decision-making and patient management.

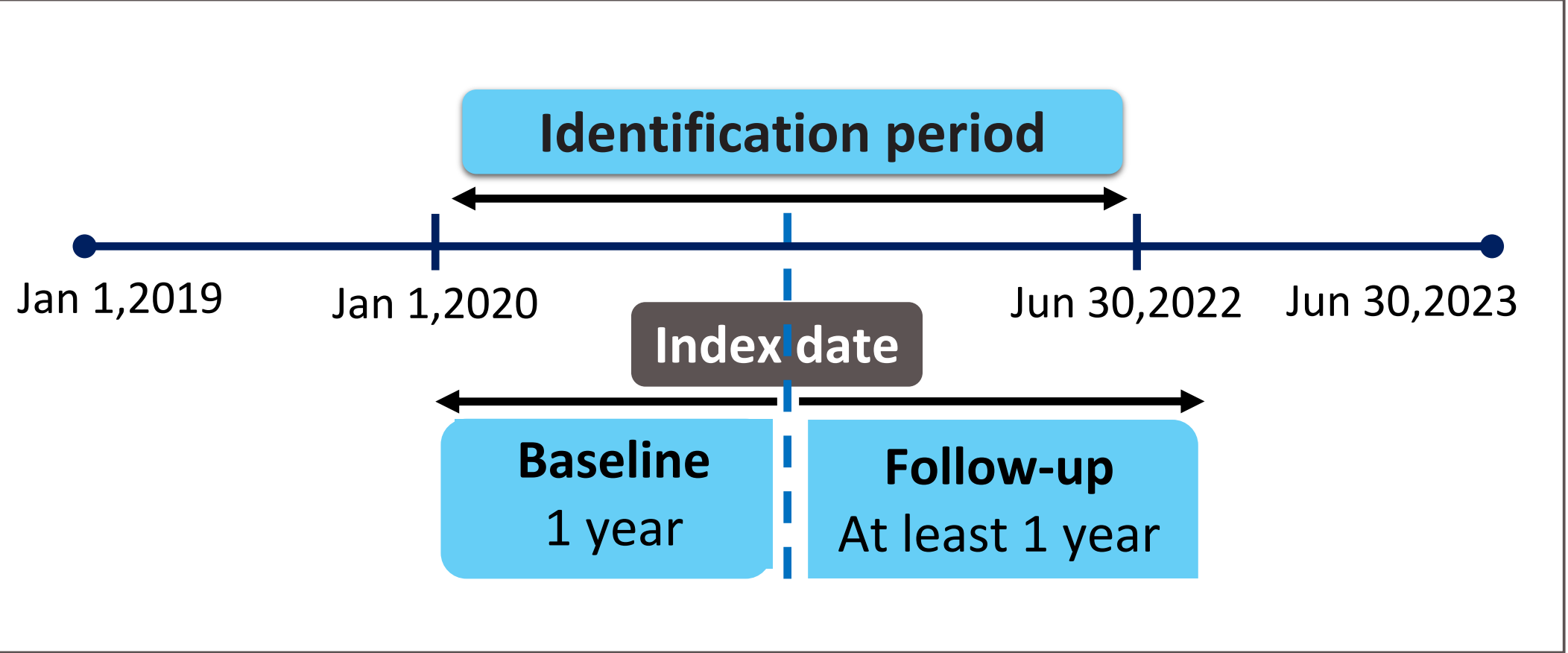
Objectives

- This study aimed to compare drug survival, switching pattern, HCRU and costs among patients treated by secukinumab (SEC), adalimumab (ADA), ustekinumab (UST), and ixekizumab (IXE).

Methods

- **Data source**
 - Data were obtained from Regional Medical Big Data Platform of Tianjin (2019-2023)
- **Study population**
 - Patients (≥18 years) diagnosed with PsO and ≥1 prescription record of biologics between January, 1, 2020 and June 30, 2022 were identified date **(Figure 1)**.
 - The first date of prescription defined as index. The baseline period was defined as the 12 months prior to the index date. Patients were followed for at least 1 year until end of the study.
 - Patients were grouped into mutually exclusive cohorts based on their index biologic agent.

Figure 1. Overview of the study period



- **Measures**
 - **Drug survival (persistence)** was defined as continuous use of the index biologic until the end of the study.
 - **Adherence** was assessed using the Proportion of Days Covered (PDC). Adherence to biologic therapy was defined as PDC ≥80%.
 - **Biologic switching** was defined as initiation of a new biologic within 180 days following discontinuation of the prior biologic.
 - **Economic burden** was assessed through psoriasis-related healthcare resource utilization and costs (¥, CNY) over a 1-year follow-up period.

Results

- **Basic characteries**
 - The study enrolled 1,306 (79.3%) on secukinumab, 182 on adalimumab, 98 on ustekinumab, 60 on ixekizumab. **(Table 1)**.
 - The average age of patients across the four subgroups ranged between **41 and 44 years** old. The proportion of **male patients was higher**, with the ixekizumab group having the highest at 75.0% and the ustekinumab group the lowest at 62.2%.
 - CCI scores across all subgroups were relatively low, ranging from **0.3 to 0.4**.

Results

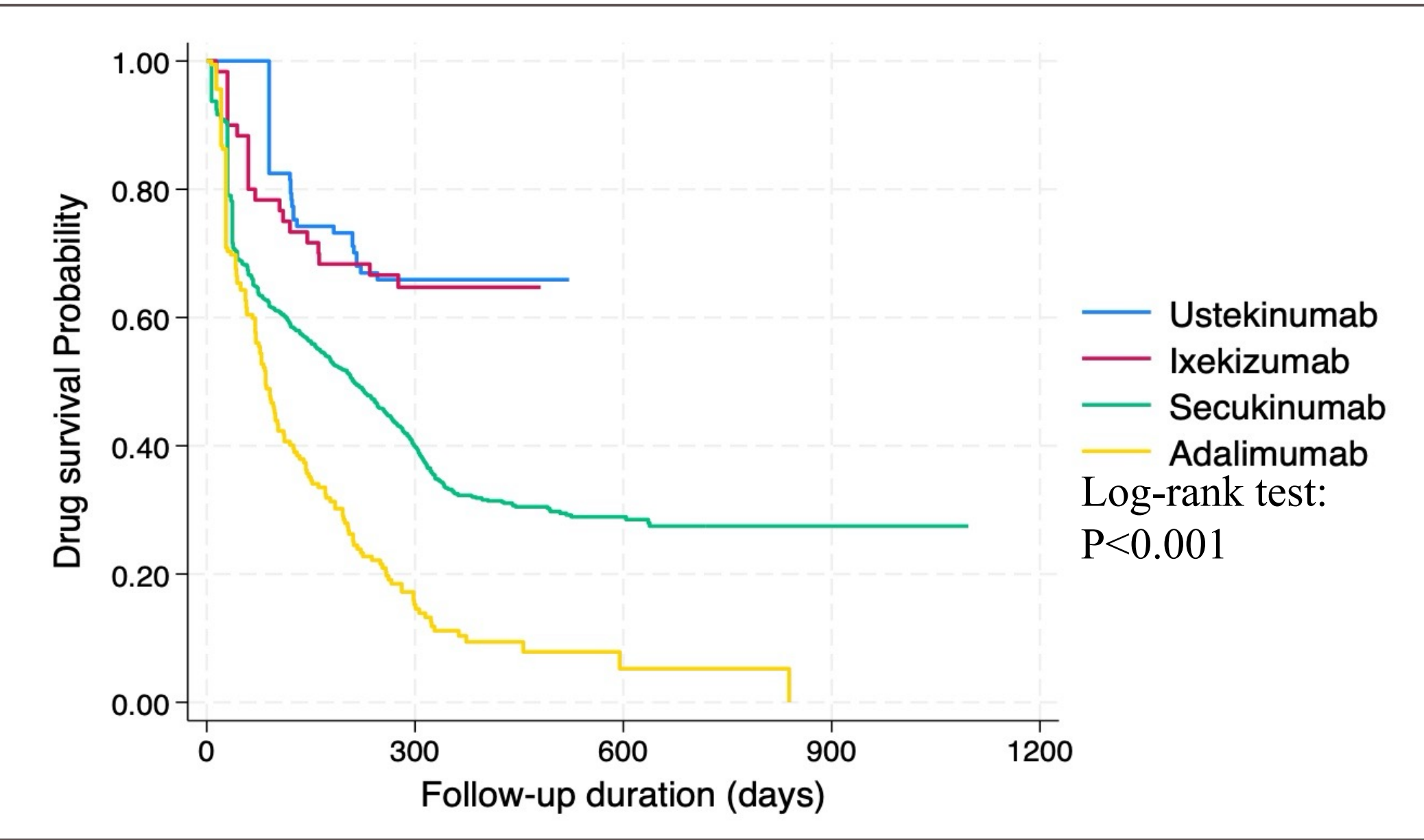
- The adalimumab group exhibited the highest proportion of patients with comorbidities (**35.7%**).
- **Topical medications** were the most used medications at baseline.

Table 1. Baseline characteristics

Variables	SEC (n=1306)	ADA (n=182)	UST (N=98)	IXE (n=60)
Demographics				
Male, n (%)	873 (66.8%)	124 (68.1%)	61 (62.2%)	45 (75.0%)
Age, mean (SD)	44.1 (14.0)	41.0 (13.2)	43.8 (15.3)	43.2 (14.3)
Baseline health				
CCI, mean (SD) ^a	0.4 (1.0)	0.4 (0.9)	0.3 (0.9)	0.3 (0.5)
Comorbidities, n (%)	325 (24.9%)	65 (35.7%)	19 (19.4%)	17 (28.3%)
Hypertension	151 (11.6%)	22 (12.1%)	8 (8.2%)	11 (18.3%)
Hyperlipidemia	119 (9.1%)	20 (11.0%)	6 (6.1%)	7 (11.7%)
Diabetes	101 (7.7%)	14 (7.7%)	5 (5.1%)	7 (11.7%)
Treatment history, n (%)				
Topical Drugs	534 (40.9%)	97 (53.3%)	49 (50.0%)	31 (51.7%)
Conventional treatments	145 (11.1%)	27 (14.8%)	13 (13.3%)	12 (20.0%)
Traditional Chinese Medicine	230 (17.6%)	35 (19.2%)	18 (18.4%)	16 (26.7%)
Phototherapy	8 (0.6%)	3 (1.6%)	1 (1.0%)	1 (1.7%)

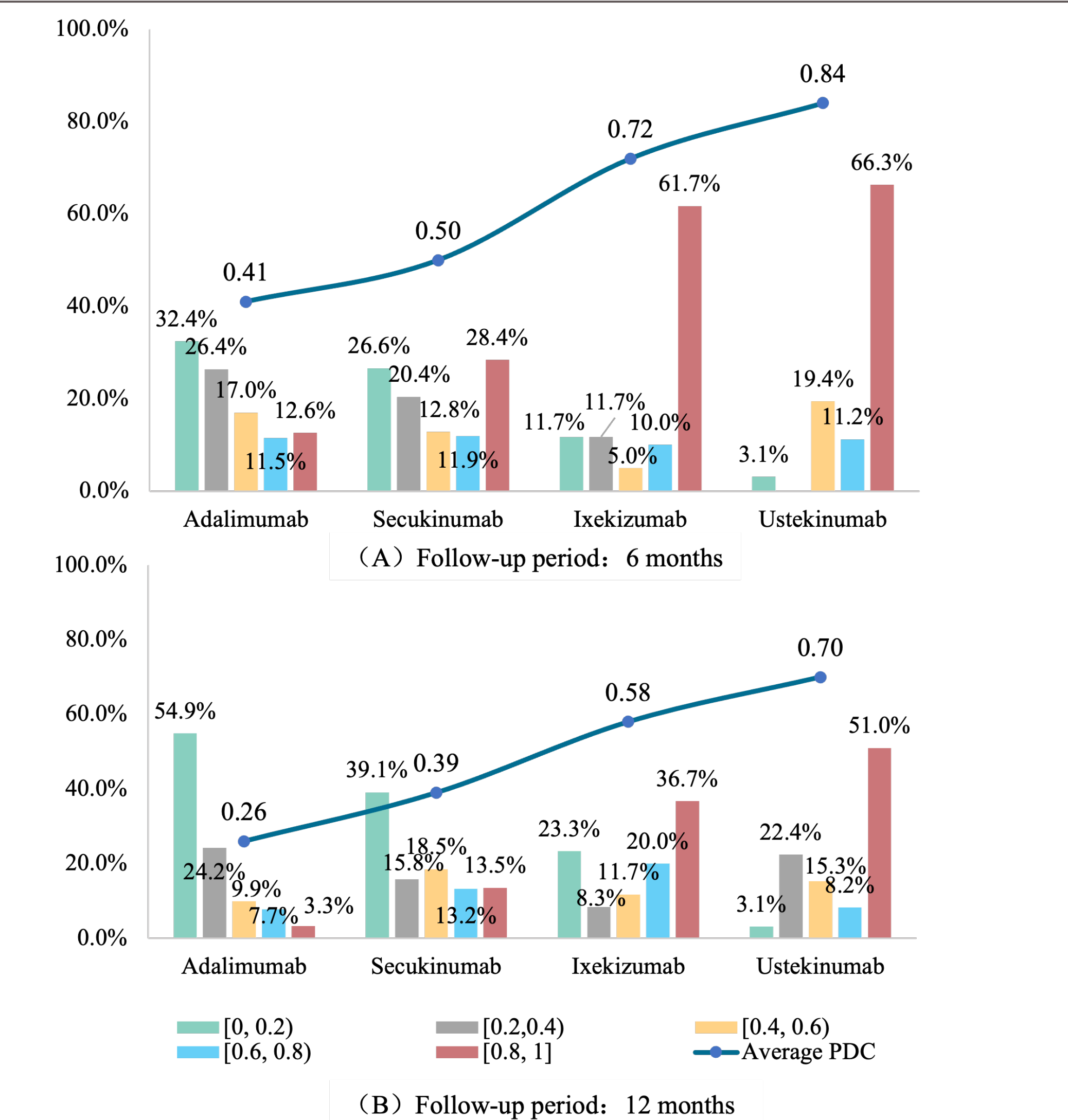
- **Drug survival**
 - UST had the highest cumulative survival rates at 12 months (**65.9%**), followed by IXE (**64.7%**), SEC (**32.3%**), and ADA (**10.4%**). **(Figure 2)**
 - Cox regression analysis demonstrated that UST and IXE exhibited the highest drug survival rate, with no significant difference between SEC and ADA (HR=1.13, 95%CI 0.54-2.36 , P=1.000).

Figure 2. Drug survival rate for each biologic



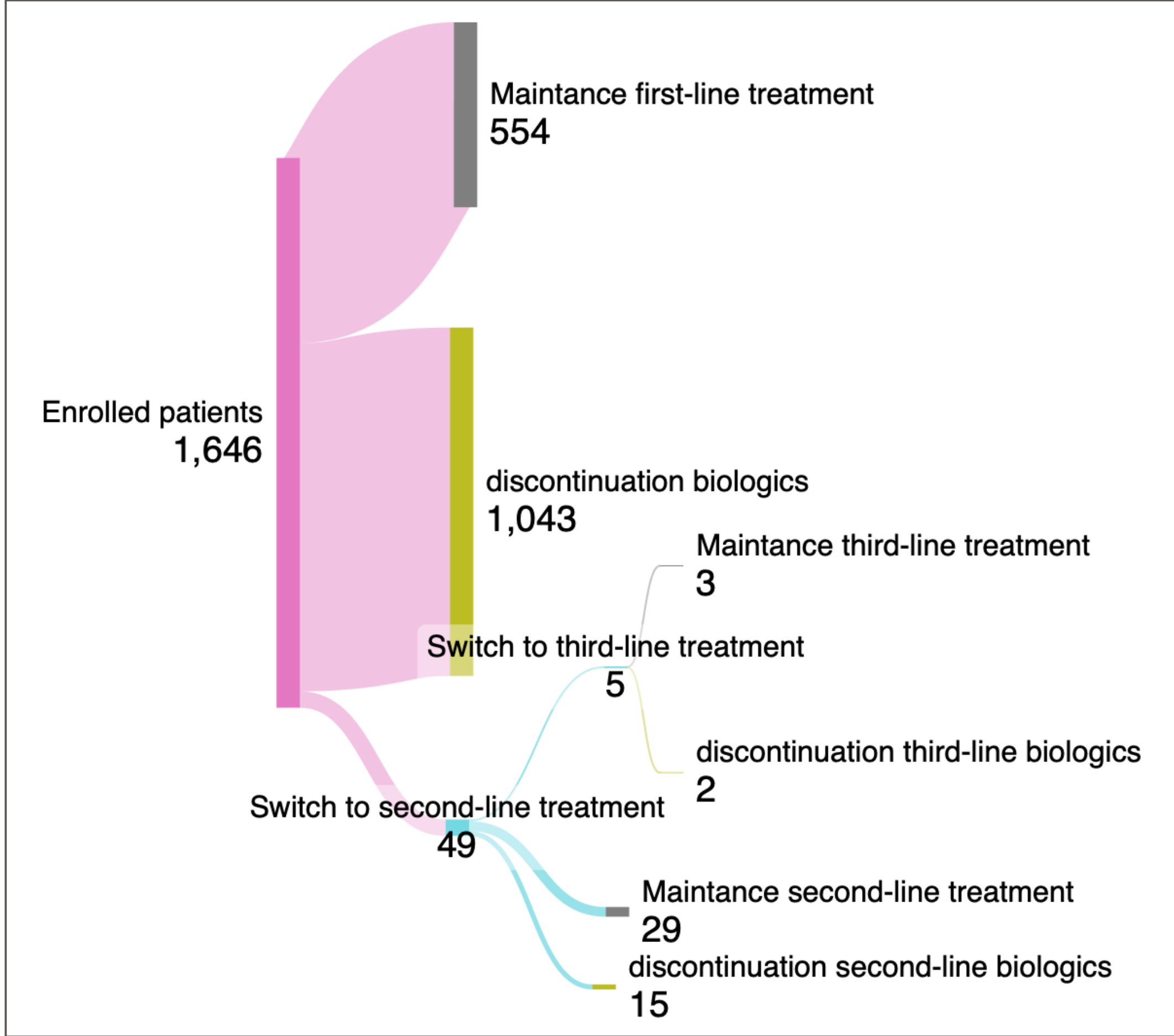
- **Adherence**
 - The UST group had the highest adherence, with proportions of adherent patients at 6, 12 months being **66.3%** and **51.0%**, respectively. **(Figure 3 A-B)**
 - The IXE group had the second-highest adherence, with proportions of persistent patients at 6, 12 months being **61.7%** and **36.7%**.

Figure 3. Adherence to Biologics Among Different Subgroups



- **Switching pattern**
 - Among all patients, only **3%** switched to a second-line biologic agent. Only five patients switched to a third-line biologic. **(Figure 4)**
 - The **ADA** group had the highest proportion of patients switching to a second-line biologic (12.6%), with 10.4% switching to SEC and 2.2% switching to UST.

Figure 4. Sankey diagram of switches pattern



- **Economic burden**
 - The IXE and UST groups exhibited the highest hospitalization rates at **83.3%** and **81.6%** , respectively. However, a higher proportion of patients in the ADA group (**99.5%**) and the SEC group (**95.6%**) had outpatient visits. **(Table 2)**
 - The UST group was associated with the highest annual costs, amounting to **¥22,478±10,909**, followed by the SEC group with ¥19,771±13,175.
 - The UST group also had the highest annual inpatient costs, at **¥ 18,762±13,217**. The SEC group had the highest annual outpatient costs, at **¥12,722±11,647**.

Table 2. Psoriasis-related HCRU and direct medical cost

Variables	SEC (n=1306)	ADA (n=182)	UST (N=98)	IXE (n=60)
Health resource utilization				
Inpatients, n (%)	405 (31.0%)	83 (45.6%)	80 (81.6%)	50 (83.3%)
Number of hospitalizations, mean (SD)	1.3 (3.2)	1.0 (2.1)	2.9 (2.4)	6.4 (4.8)
Outpatients, n (%)	1248 (95.6%)	181 (99.5%)	57 (58.2%)	41 (68.3%)
Outpatient visits, mean (SD)	7.5 (4.6)	10.9 (6.2)	2.4 (3.3)	2.6 (3.2)
Costs, mean (SD)				
Inpatient costs	7048±13815	7361±11928	18762±13217	14697±9554
Outpatient costs	12722±11647	9632±9512	3716±7649	1809±2716

- **Conclusions**
 - The persistence of biologic agents is poor, patients treated with ADA and SEC exhibit the poorest adherence. Patients treated with ADA exhibit the highest incidence of therapy switching.
 - Ustekinumab incurred the highest overall costs. Patients treated with SEC and ADA primarily visit outpatient, while those treated with UST and IXE are more likely to be hospitalized.
 - Overall, marked differences exist in drug survival and economic burdens among different biologics. Despite of the availability of biologics, the unmet needs remain in psoriasis management.

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Acknowledgments

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Declaration of interests

Xingzhi Wang is the employees of Bristol Myers Squibb. Other authors have none to declare.