Burden of Illness: Direct and Indirect Economic Costs of Moderate-to-Severe Atopic Dermatitis in the United States

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*At the time the study was conducted.

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KEY TAKEAWAYS

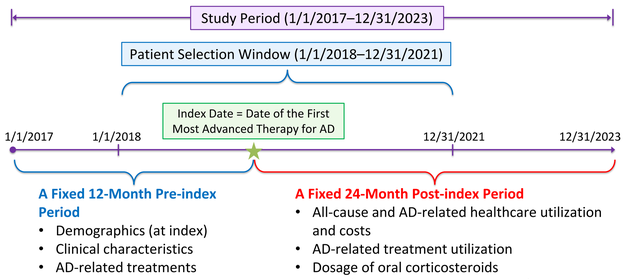
- Atopic dermatitis (AD) management contributed substantially to total healthcare costs (HCCs).
- Despite lower overall spending, AD-related costs were higher and allergist/immunologist visits were more frequent in adolescents vs adults.
- These findings highlight unmet needs and support continued improvement in moderate-to-severe AD management to lessen economic burden.

BACKGROUND/OBJECTIVE

- The economic burden of AD is substantial, with annual expenditures attributable to moderate-to-severe AD estimated at $5 billion in the US.[1]
- As new advanced systemic therapies become more widely used for moderate-to-severe AD, there is a need to understand the current treatment patterns, healthcare resource utilization (HCRU), and direct and indirect economic burden.
- **Objective:** To describe the economic burden of moderate-to-severe AD in the US.

METHODS

Figure 1. Study Design



Study Design: Retrospective claims analysis using administrative claims data between January 1, 2017, and December 31, 2023

Data Sources: MarketScan Commercial database, MarketScan Medicare databases, and MarketScan Health and Productivity Management database

Study Population and Cohort Assignment

- Eligible patients with moderate-to-severe AD were identified based on the first systemic treatment or topical ruxolitinib claim within 30 days of the first of at least two separate AD diagnosis claims between January 1, 2018, and December 31, 2021.
- Index date was hierarchically assigned based on the first date of the most advanced therapy, in the following order:
  1. Approved biologics, topical ruxolitinib, or oral Janus kinase inhibitor (JAKi) therapies (ie, advanced therapy)
  2. Systemic immunosuppressives (SISs)
  3. Systemic corticosteroids (SCSs)
- Patients were required to have a ≥ 12-month pre-index baseline period and ≥ 24-month post-index follow-up period with continuous medical and pharmacy benefits coverage (ie, no gaps in enrollment > 40 days).

Data Analysis and Population Stratifications

- This study described patient characteristics, all-cause and AD-related HCRU, HCCs, AD-related treatment utilization, and oral and injectable SCS use over a fixed 24-month follow-up among patients aged ≥ 12 y with moderate-to-severe AD.
- We assessed absenteeism (ABS) and associated indirect costs for adults (aged 18–64 y) in separate eligible populations.

RESULTS

Table 1. Patient Characteristics

Characteristic	All Patients N = 25,269	Age 12–17 y at Index N = 3,346	Age 18–64 y at Index N = 19,177	Age 65+ y at Index N = 2,746
Age at index, y, mean (SD)	42.5 (19.1)	14.6 (1.7)	42.8 (13.8)	74.4 (6.6)
Sex, n (%)				
Male	9,780 (38.7)	1,432 (42.8)	7,051 (36.8)	1,297 (47.2)
Female	15,489 (61.3)	1,914 (57.2)	12,126 (63.2)	1,449 (52.8)
Payer, n (%)				
Commercial	22,448 (88.8)	3,346 (100.0)	19,101 (99.6)	1 (0.0)
Medicare Supplemental	1,552 (6.1)	0 (0.0)	45 (0.2)	1,507 (54.9)
Medicare Advantage	1,269 (5.0)	0 (0.0)	31 (0.2)	1,238 (45.1)
Charlson Comorbidity Index, mean (SD)	0.7 (1.2)	0.4 (0.5)	0.5 (1.0)	1.9 (2.0)

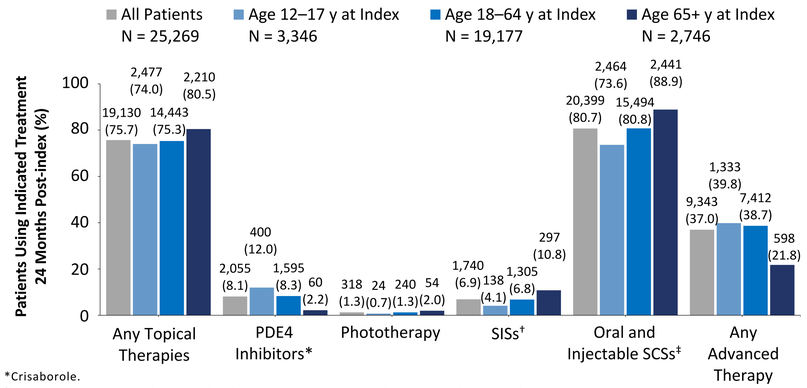
Table 2. Indexed Treatments

Index treatment, n (%)	All Patients N = 25,269	Age 12–17 y at Index N = 3,346	Age 18–64 y at Index N = 19,177	Age 65+ y at Index N = 2,746
Advanced therapy	8,643 (34.2)	1,236 (36.9)	6,857 (35.8)	550 (20.0)
Biologics (dupilumab, tralokinumab)	8,584 (34.0)	1,219 (36.4)	6,819 (35.6)	546 (19.9)
JAKis (upadacitinib, abrocitinib)	12 (0.0)	0 (0.0)	9 (0.0)	3 (0.1)
Topical ruxolitinib	47 (0.2)	17 (0.5)	29 (0.2)	1 (0.0)
SISs*,†	1,014 (4.0)	85 (2.5)	724 (3.8)	205 (7.5)
SCSs†,‡ (oral and injectable)	15,612 (61.8)	2,025 (60.5)	11,596 (60.5)	1,991 (72.5)

*Includes methotrexate, cyclosporine, azathioprine, mycophenolate mofetil, oral tacrolimus, and interferon gamma.
†Due to the hierarchical approach in assigning the index treatment, SIS and SCS index treatment may be underestimated.
‡Includes dexamethasone, methylprednisolone, prednisolone, and prednisone.
JAKi, Janus kinase inhibitor; SCS, systemic corticosteroid; SIS, systemic immunosuppressive.

- SCSs were the most common index treatment (62%).
- Indexed AD treatment patterns were generally similar between adolescents and adult patients aged 18–64 y, with SISs slightly more common in adults.

Figure 2. AD-Related Treatment Utilization



*Crisaborole.
†Methotrexate, cyclosporine, azathioprine, mycophenolate mofetil, oral tacrolimus, and interferon gamma.
‡Dexamethasone, methylprednisolone, prednisolone, and prednisone.
AD, atopic dermatitis; PDE4, phosphodiesterase 4; SCS, systemic corticosteroid; SIS, systemic immunosuppressive.

- In the 24-month follow-up, SCSs were the most common treatment for all patients (81%), followed by topical corticosteroids (72%) and advanced therapy (37%), largely driven by biologic usage—*scan the QR code for more details*.
- Treatment patterns were similar between age groups. Adolescents had the highest frequency of advanced therapy (40%), whereas adults aged 65+ y had the highest frequency of SCSs (89%).

Table 3. AD-Related PPPY HCRU 24 Months Post-index

		All Patients N = 25,269	Age 12–17 y at Index N = 3,346	Age 18–64 y at Index N = 19,177
Inpatient				
	Patients with an admission, n (%)	2 (0.0)	1 (0.0)	1 (0.0)
	Number of inpatient admissions among all patients, mean (SD)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Outpatient				
Emergency department visits	Patients with a visit, n (%)	582 (2.3)	87 (2.6)	457 (2.4)
	Number of visits among all patients, mean (SD)	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)
Urgent care visits	Patients with a visit, n (%)	1,158 (4.6)	115 (3.4)	974 (5.1)
	Number of visits among all patients, mean (SD)	0.0 (0.2)	0.0 (0.1)	0.0 (0.2)
Outpatient physician office visits	Patients with an office visit, n (%)	22,568 (89.3)	3,106 (92.8)	17,131 (89.3)
	Allergist/immunologist	3,827 (15.1)	830 (24.8)	2,778 (14.5)
	Dermatologist	12,552 (49.7)	1,591 (47.5)	9,541 (49.8)
	Dietitian/nutritionist	0 (0.0)	0 (0.0)	0 (0.0)
	Primary care physician	7,780 (30.8)	1,374 (41.1)	5,628 (29.3)
	Psychologist/psychiatrist	6 (0.0)	1 (0.0)	5 (0.0)
	Number of office visits among all patients, mean (SD)	1.5 (1.7)	1.7 (1.5)	1.4 (1.7)
Other outpatient services (laboratory, radiology, etc)	Patients with an outpatient service, n (%)	16,298 (64.5)	2,028 (60.6)	12,179 (63.5)
	Number of outpatient services among all patients, mean (SD)	1.3 (3.7)	1.0 (2.7)	1.3 (3.7)
Outpatient pharmacy				
	Patients with a prescription, n (%)	21,684 (85.8)	2,830 (84.6)	16,517 (86.1)
	Number of prescriptions among all patients, mean (SD)	4.7 (5.2)	4.9 (5.2)	4.8 (5.3)

AD, atopic dermatitis; HCRU, healthcare resource utilization; PPPY, per patient per year.

- In the 24-month follow-up, patients had few hospital (0%), emergency department (2%), and urgent care (5%) visits related to AD but high use of outpatient physician services (89%), including dermatologist (50%), primary care (31%), and allergist/immunologist (15%) office visits.

Table 4. PPPY HCCs 24 Months Post-index

Cost Category	All Patients N = 25,269	Age 12–17 y at Index N = 3,346	Age 18–64 y at Index N = 19,177
AD-related HCCs,* USD, mean (SD)			
Inpatient costs	1 (110)	3 (156)	1 (107)
Outpatient costs	324 (3,301)	329 (839)	324 (3,740)
Outpatient pharmacy costs	11,354 (17,196)	12,481 (17,607)	11,844 (17,388)
Total medical costs (inpatient + outpatient)	325 (3,303)	331 (856)	325 (3,742)
Total costs (total medical + outpatient pharmacy)	11,678 (17,541)	12,812 (17,679)	12,169 (17,808)
Total costs attributable to AD, %	43.4	60.4	44.6

*Costs in 2023 USD.
AD, atopic dermatitis; HCC, healthcare cost; PPPY, per patient per year; USD, US dollars.

- In the 24-month follow-up, total costs remained high for both all-cause ($26,938) and AD-related ($11,678) HCCs, with 43.4% of total costs attributable to AD—*scan the QR code for more details*.
- Adolescents incurred higher AD-related HCCs ($12,812) than adults aged 18–64 y ($12,169) and a greater share of expenses driven by AD (60% and 45%, respectively).

AD-Related ABS and Work Productivity Costs

- Overall, 67% of patients with moderate-to-severe AD had one or more ABS claims, with a mean 170 hours lost attributing to a mean $4,760 productivity cost PPPY—*scan the QR code for more details*.

LIMITATIONS

- Assumed no disease progression and stable outcomes over time
- Treatment adherence and effectiveness were not assessed, which could influence outcomes
- Potential disease misclassification bias with the use of primary diagnostic codes to identify AD
- Data did not capture recently approved biologics or JAKis
- Time frame includes the COVID-19 pandemic

DISCLOSURES AND FUNDING

Disclosures:
TT, AS, KMD, and GK are employees of Amgen Inc.
JQ and FH are employees of Kyowa Kirin, Inc.

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