Estimated conjunctivitis-related healthcare cost savings with increased tralokinumab use versus other biologics among patients with moderate-severe atopic dermatitis in the United States

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Conclusions

- This study demonstrated the substantial burden of conjunctivitis among patients with moderate-severe atopic dermatitis (AD) treated with biologics
- Shifting prescribing patterns toward tralokinumab, with its comparatively lower conjunctivitis rate, could yield considerable annual cost savings US-wide; an increase in the market share of tralokinumab from 6% to 12% could yield over $6.5M in savings
- These estimates represent one component of the overall economic burden where additional cost offsets may primarily arise from tralokinumab's favorable tolerability and dosing flexibility which could allow for administration every 4 weeks rather than every 2 weeks
- Optimizing biologic selection across the AD treatment landscape may deliver both clinical and economic value to patients and healthcare systems

Objectives

- To estimate annual US-level costs attributable to conjunctivitis events in patients aged ≥12 years with moderate-to-severe AD receiving biologic therapy
- To simulate potential cost savings associated with an increase in the use of tralokinumab versus other biologics based on its comparatively lower incidence of conjunctivitis events

Synopsis

- AD is a chronic skin disease characterized by inflammation, redness, and irritation; in more severe cases, standard-of-care treatment with topical corticosteroids may inadequately control symptoms[1]
- Advances in biologic therapies, including the FDA approvals of dupilumab, tralokinumab, and lebrikizumab, have substantially improved outcomes for patients with moderate-to-severe AD, offering targeted mechanisms of action and favorable safety profiles[1-4]
- Nonetheless, ocular events, most notably conjunctivitis, are recognized class-related adverse events across approved biologics, with varying IRs observed in clinical trials[1-4]
- Prior research has demonstrated a high comorbid rate of allergic conjunctivitis at time of diagnosis with AD which may be exacerbated by biologic use and lead to increased rates of conjunctivitis adverse events versus untreated patients[5]
- Tralokinumab, a fully human anti–interleukin-13 monoclonal antibody, has demonstrated a lower rate of conjunctivitis compared with other biologics, suggesting there may be opportunities to optimize tolerability and reduce related healthcare costs versus other biologics[4]
- In this study, a prevalence-based approach was used to estimate annual excess conjunctivitis events from treatment with biologics (dupilumab, lebrikizumab, or tralokinumab) for moderate-to-severe AD in the US, and associated healthcare costs based on inputs available from published literature and other publicly available sources
- The findings highlight a significant burden of conjunctivitis among patients with moderate-to-severe AD treated with biologics, and suggest that increased use of tralokinumab compared to other biologics could result in reduced conjunctivitis events and cost savings US-wide

Methods

Study Design & Data Sources

- A prevalence-based approach was used to estimate annual conjunctivitis events among adolescents and adults (12 years of age and older) receiving biologics (dupilumab, lebrikizumab, or tralokinumab) for moderate-to-severe AD in the US, and associated healthcare costs
- Required inputs, including US population estimates, prevalence of moderate-to-severe AD, IRs for conjunctivitis associated with biologics, and excess costs per conjunctivitis event were identified from a targeted literature review and other publicly available sources **(Table 1)**
  - Incidence rate ratios (IRRs) of conjunctivitis from clinical trials for dupilumab, lebrikizumab, and tralokinumab were calculated as IR [treated] / IR [placebo]
  - To account for differences in trial populations and obtain comparable estimates of conjunctivitis events, IRRs were computed using biologic-specific IR [treated] and IR[placebo], and applied to a common contemporary estimate of the IR among untreated patients

Outcomes and Analyses

- Total annual conjunctivitis events among patients with moderate-to-severe AD treated with biologics in the US were estimated as the sum of estimated conjunctivitis events occurring in patients receiving each biologic based on integrated safety results from clinical trials, calculated as:
  - Number of annual conjunctivitis events for patients receiving biologic A = Number of patients receiving biologic A × incidence of conjunctivitis among moderate-severe AD per patient-year × IRR of conjunctivitis associated with biologic A vs placebo
- Associated annual costs were reported in 2025 USD based on the estimated cost of a conjunctivitis event[12] and estimated at the US level and per patient with moderate-to-severe AD receiving biologics
  - A sensitivity analysis was conducted to estimate lower[13] and upper[14] bound estimates for the cost of conjunctivitis
- The base-case scenario was derived using current market shares and three hypothetical scenarios modeled the estimated impact of increasing tralokinumab market shares (i.e., 12%, 24%, 48%), which was assumed to be taken equally from dupilumab and lebrikizumab until a minimum of 10% share
  - Estimated annual conjunctivitis events avoided and associated cost differentials versus the base-case were reported for each hypothetical scenario

Table 1 Targeted literature inputs

Required input	Value	Source(s)
US population (March 31, 2025)	341,549,703	US Census Bureau[6]
US population aged 12 years or older	86.2%	US Census Bureau[7]
Adolescent and adult population with AD	Adolescents (age 13-17): 9.8% Adults (age >17): 7.3% Pooled estimate[a]: 7.6%	National Center for Health Statistics[8]
Proportion of AD with moderate-severe disease	Adolescents (age 13-17): 34.4% Adults (age >17): 39.9% Pooled estimate[a]: 39.1%	Silverberg et al.[9]; Chiesa Fuxench et al.[10]
Proportion of moderate-severe AD treated with biologics	26.3%	Boytsov et al.[11]
Current landscape market shares for dupilumab, lebrikizumab, and tralokinumab	Dupilumab: 79% Lebrikizumab: 15% Tralokinumab: 6%	Veeva Compass Pathway IQVIA monthly National Prescription Audit (July 2025)
IR of conjunctivitis per 100PY among patients with moderate-severe AD[b]	10.7	Stein Gold et al.[3]
IRR of conjunctivitis among patients receiving each biologic Q2W versus placebo (IR[treated]/IR[placebo])	Tralokinumab: 2.5 Dupilumab: 4.4 Lebrikizumab: 4.0	Reich et al.[4] Akinlade et al.[2] Stein Gold et al.[3]
Excess cost per conjunctivitis episode (inflated to March 2025 USD)	Base case: $263 Lower bound[c]: $135 Upper bound: $288	Pepose et al.[12]; Zimmermann et al.[13]; Schneider et al.[14]

[a] Pooled estimates were obtained by applying estimated proportions of adults versus adolescents in the US to generate a weighted average. [b] The incidence rate of conjunctivitis among patients with moderate-severe AD was proxied by the observed incidence rate in the placebo arm of the most recent clinical trial for a biologic of interest for the treatment of moderate-to-severe AD. [c] The lower bound estimate for excess cost per conjunctivitis episode was obtained by applying proportions of incident allergic versus infectious conjunctivitis to separate cost estimates for allergic and infectious conjunctivitis, to generate a weighted average.

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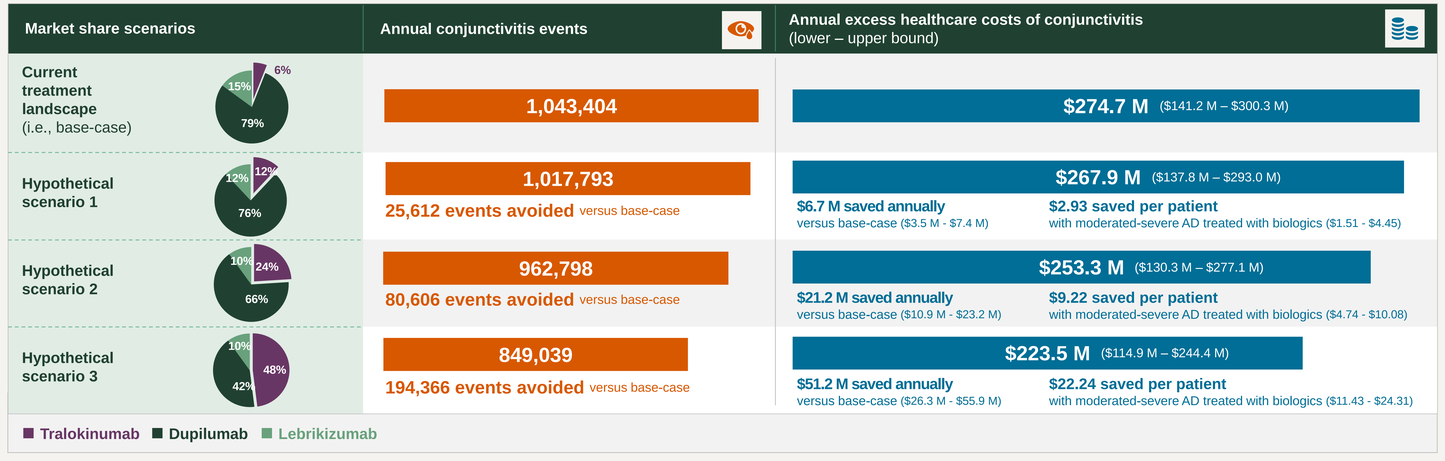
Results

Figure 1 Population flowchart

- In 2025, an estimated 22.4 million US individuals aged ≥12 years (7.6%) had AD, of whom 8.7 million (39.1%) had moderate-to-severe disease and 2.3 million (26.3%) received biologic therapy **(Figure 1)**

Figure 2 Scenario analyses



- Under the current treatment landscape (base-case scenario), there were an estimated 1.04 million conjunctivitis events among patients with moderate-to-severe AD treated with biologics, representing $274.7 million in excess healthcare costs (**Figure 2**)
- Under simulated scenarios with increasing use of tralokinumab, estimated **avoided conjunctivitis events ranged from 25,612 – 194,366**, resulting in a range of **cost savings from $6.7 – $51.2 million overall**, or $2.93 – $22.24 per patient with moderate-severe AD treated with biologics
- *Limitations:* IRs from clinical trials contain both infectious and allergic events and may not represent real-world rates of conjunctivitis. Further, literature on costs per conjunctivitis event vary; therefore, sensitivity analyses were conducted to provide lower and upper bound estimates.

Abbreviations AD: atopic dermatitis; FDA: Food and Drug Administration; IR: incidence rates; IRR: incidence rate ratios; K: thousand; M: million; PY: person-year; US: United States; USD: United States Dollar

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Disclosures
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