Comparison of overall pharmacy cost between deucravacitinib and branded systemic treatments among patients with moderate to severe plaque psoriasis in the US

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Background

- Treatment costs for patients with moderate to severe psoriasis are high in the United States, with pharmacy costs accounting for the majority of all-cause healthcare costs[1]
- Deucravacitinib is an oral, selective, allosteric tyrosine kinase 2 (TYK2) inhibitor, approved by the US Food and Drug Administration for the treatment of adults with moderate to severe plaque psoriasis who are candidates for systemic therapy or phototherapy[2]
- In the pivotal clinical trials POETYK PSO-1 and PSO-2, deucravacitinib was shown to be efficacious and well tolerated[3,4]

Objectives

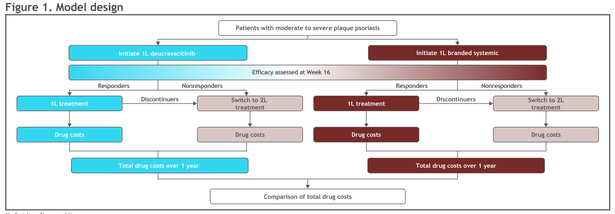
- To estimate the total pharmacy costs per patient initiating deucravacitinib vs first-line (1L) branded systemics for the treatment of adult patients with moderate to severe plaque psoriasis

Methods

Model overview and assumptions

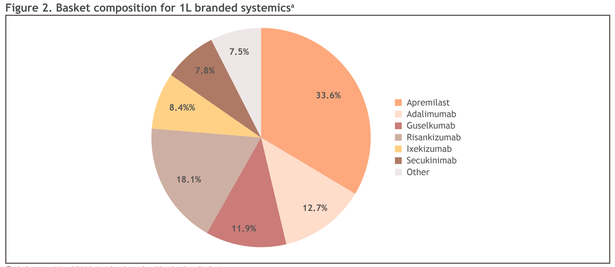
- A pharmacy cost calculator was developed using a US commercial payer perspective with a 1-year time horizon (**Figure 1**)
- Assuming a health plan with 1 million members and applying published prevalence estimates,[5-8] the model compared pharmacy costs per member per month (PMPM) for patients naive to apremilast or biologics initiating therapy with either deucravacitinib or 1L branded systemics (**Table 1**)
- The basket composition of 1L branded systemics is based on real-world market share distribution (**Figure 2**)
- The model assumed that patients who achieved 75% reduction from baseline in Psoriasis Area and Severity Index score (PASI 75) at Week 16 continued their 1L treatment at the maintenance dose for the remainder of the year; patients who did not achieve PASI 75 response switched to a second-line (2L) biologic treatment, also based on real-world market share distribution (**Figure 3**)
- After Week 16, treatments incurred an annualized discontinuation rate[9]; patients who discontinued were assumed to switch to 2L biologic treatment (**Figure 3**)

Figure 1. Model design



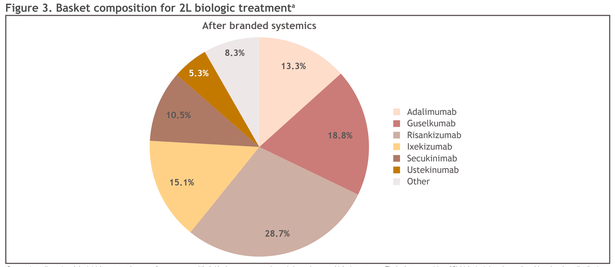
1L, first-line; 2L, second-line.

Figure 2. Basket composition for 1L branded systemics[a]



[a]The basket composition of 1L biologics is based on real-world market share distribution.
1L, first-line.

Figure 3. Basket composition for 2L biologic treatment[a]



[a]Once patients discontinued the initial treatment because of nonresponse at Week 16, they were assumed to switch to subsequent biologic treatment. The basket composition of 2L biologics is based on real-world market share distribution.
2L, second-line.

Model inputs

- US epidemiologic data were used to estimate the population with moderate to severe psoriasis initiating 1L branded systemics (**Table 1**)[5-8]
- The model included only direct pharmacy costs, based on the wholesale acquisition cost (WAC) obtained from Merative MicroMedex Red Book, September 2022, for branded systemic treatments for moderate to severe plaque psoriasis (**Table 2**)[10]
- The response rates were based on an NMA[11] of treatment efficacy shown in phase 3 clinical trials
  - The response rates for 1L branded systemics reflected a weighted average of treatment efficacy and 1L market share
- Annual discontinuation rates were derived from a real-world claims study[9] and were applied to each treatment
  - The discontinuation rate applied to 1L branded systemics (22.4%) was a weighted average of real-world discontinuation rates and market share
  - As there is no current real-world discontinuation rate for deucravacitinib, branded oral treatments were assumed to have the same discontinuation rate (16.5%)

Table 1. Population inputs

Parameter	Input	Source
Total plan population	1,000,000	Model assumption
Prevalence of psoriasis in the commercial population	3.0%	Armstrong AW, et al, 2021[5]
Incidence of psoriasis	78.9 per 100,000	Icen M, et al, 2009[6]
Proportion of patients with psoriasis who have plaque psoriasis	90%	Boehncke WH and Schön MP, 2015[7]
Proportion of patients with plaque psoriasis who have moderate to severe plaque psoriasis	22.0%	Lebwohl M, et al, 2022[8]
Proportion of patients with moderate to severe plaque psoriasis receiving systemic treatment	57.7%	Lebwohl M, et al, 2022[8]
Proportion of patients with moderate to severe plaque psoriasis initiating 1L branded systemics	16.3%	Internal claims analysis

1L, first-line.

Table 2. Treatment costs

Treatment	Strength (mg)/unit	Units/pack	Cost/pack
Deucravacitinib	6 mg	30	$6164.38
Apremilast	30 mg	60	$4344.18
Apremilast titration pack	27 doses titrated	27	$843.75
Adalimumab	40 mg/0.8 mL	2	$6409.83
Etanercept	50 mg/1 mL	1	$1640.91
Ustekinumab	45 mg/0.5 mL	1	$12,748.56
Certolizumab	200 mg	2	$5099.68
Infliximab	100 mg	1	$1167.82
Secukinumab	150 mg	2	$6471.27
Ixekizumab	80 mg	1	$6272.80
Guselkumab	100 mg	1	$12,583.04
Risankizumab	150 mg	1	$18,272.79
Brodalumab	210 mg	2	$4321.93
Tildrakizumab	100 mg	1	$15,487.40

Model outcomes

- Outcomes included total pharmacy costs, pharmacy costs per patient, cost PMPM by treatment, and incremental cost differences PMPM (**Table 3**)
- Scenario analysis, conducted to test the robustness of the model, varied the point at which treatment switch could occur given failure to respond (with response assessed at Week 24 rather than at Week 16), reduced the discontinuation rate to 0, and applied a 10% drug cost increase for all treatments except deucravacitinib (**Table 4**)

Table 3. Study endpoints

Primary endpoints	Secondary endpoints
Cost per patient over 52 weeks	Total PMPM cost
Difference in treatment cost	• Difference in PMPM cost • Total cost to the payer by treatment • Difference in total cost to the payer

PMPM, per member per month.

Table 4. Scenario analysis

Scenario	Description
Response assessment at Week 24	Patients are assessed for response at Week 24 instead of Week 16 for determining treatment continuation or treatment switching
No discontinuation	After Week 16, all responders continue their initial treatment and there is no further discontinuation/switching during the remainder of the time horizon
Comparator drug prices except deucravacitinib increase by 10%	Comparator drug prices, including 1L branded systemics and subsequent treatments, are increased by 10%; deucravacitinib price remains the same

1L, first line.

Results

Total pharmacy costs

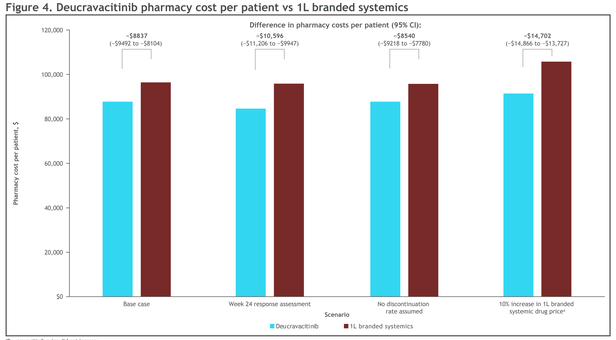
- Using a hypothetical US healthcare plan with 1 million members, it was estimated that 407 patients with moderate to severe plaque psoriasis would initiate 1L branded systemic treatment
- At a $75,000 per year WAC, deucravacitinib had $8837 (95% confidence interval [CI], −$9492 to −$8104) lower pharmacy cost per patient compared with branded systemics ($87,490 vs $96,327) (**Table 5**; **Figure 4**)
- Deucravacitinib led to an incremental PMPM cost reduction of $0.30 over 52 weeks (95% CI, −$0.32 to −$0.27) (**Figure 5**)
- Overall pharmacy cost savings over 52 weeks for patients initiating deucravacitinib exceeded $3.5 million (**Table 5**; **Figure 6**)
- The robustness of the results was confirmed by scenario analysis (**Table 6**)

Table 5. Base case analysis

Outcome	Deucravacitinib	1L systemics	Difference (95% CI)
Total pharmacy costs	$35,607,363	$39,204,033	−$3,596,670
Pharmacy cost per patient	$87,490	$96,327	−$8837 (−$9492 to −$8104)

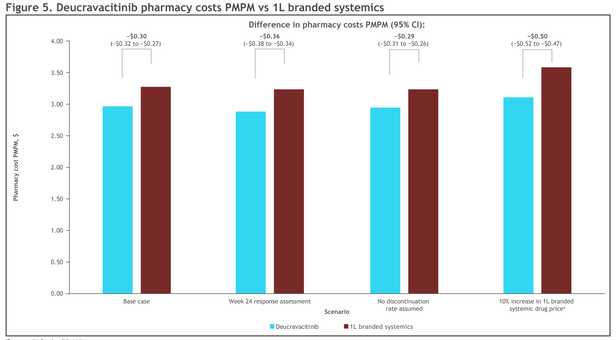
1L, first line; CI, confidence interval.

Figure 4. Deucravacitinib pharmacy cost per patient vs 1L branded systemics



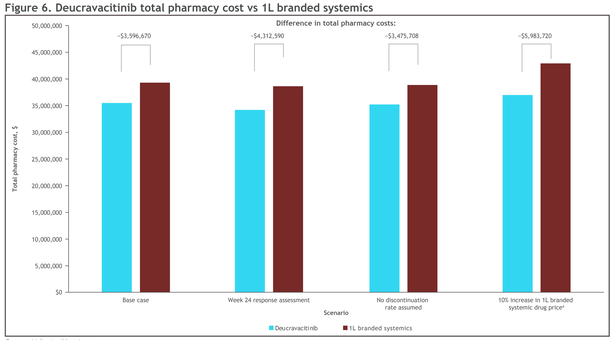
[a]Deucravacitinib price did not increase.
1L, first-line; CI, confidence interval.

Figure 5. Deucravacitinib pharmacy costs PMPM vs 1L branded systemics



[a]Deucravacitinib price did not increase.
1L, first-line; CI, confidence interval; PMPM, per member per month.

Figure 6. Deucravacitinib total pharmacy cost vs 1L branded systemics



[a]Deucravacitinib price did not increase.
1L, first-line.

Table 6. Scenario analysis

Outcomes	Deucravacitinib	1L branded systemics	Difference (95% CI)
Response assessed at 24 weeks			
Pharmacy cost per patient	$84,644	$95,240	−$10,596 (−11,206 to −$9947)
No discontinuation rate assumed			
Pharmacy cost per patient	$87,136	$95,676	−$8540 (−$9218 to −$7780)
10% increase in 1L branded systemic drug prices (deucravacitinib does not increase)			
Pharmacy cost per patient	$91,257	$105,960	−$14,702 (−$15,172 to −$14,055)

1L, first-line; CI, confidence interval.

Conclusion

- The total pharmacy cost was estimated to be lower in patients with moderate to severe plaque psoriasis who initiated deucravacitinib compared with those who initiated 1L branded systemics

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Disclosures

- **SHP, SH, KW, LN, and VP:** Employees of and may own stock options in Bristol Myers Squibb
- **ML, JS, and DP:** Employees of OPEN Health, which received consulting fees from Bristol Myers Squibb

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