

# Real-World Healthcare Resource and Cost Utilization and AI/NLP-Derived Clinical Drivers of Biologic-to-Biosimilar Switching in Inflammatory Bowel Disease (IBD)

Vikash Verma, Pankaj Bhardwaj, Louis Brooks Jr, Marissa Seligman, Shashi Khan, Abhimanyu Roy, Abhinav Nayyar, Ankit Arora, Shakir Khan, Zaheer Mohammad T, Archana Prasad, Kirti Batra, Riddhi Markan, Arunima Sachdev, Anuj Gupta, Vishan Khataavkar, Hitesh Khandelwal, Satish Kumar, Amit Kaushal

## Background

- Inflammatory bowel disease (IBD) requires long-term biologic therapy, contributing to substantial healthcare utilization and costs.
- Biosimilars are increasingly adopted as cost-saving alternatives to originator biologics, yet real-world evidence on post-switch healthcare utilization remains limited.
- Integrating claims analysis with AI-enabled natural language processing (NLP) enables evaluation of both utilization changes and clinician-documented drivers of biosimilar switching.

## Objective

- To evaluate real-world changes in healthcare resource utilization (HCRU) following switches from originator biologics to biosimilars among adults with inflammatory bowel disease (IBD) and to use AI-enabled natural language processing (NLP) to identify clinician-documented reasons for switching.

## Methodology

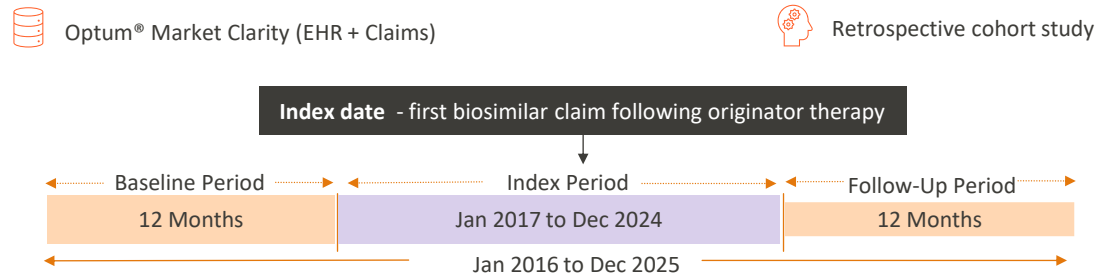
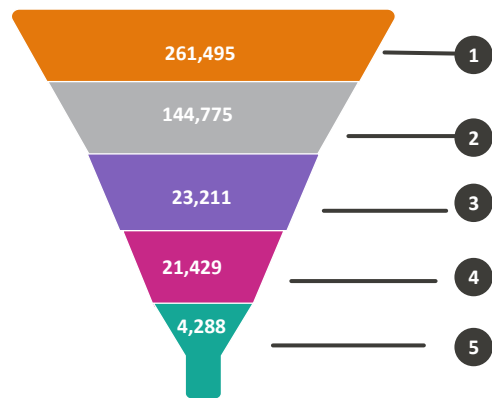


Figure 1.1. Patient Selection and Attrition



- Patients with  $\geq 1$  claim for a biosimilar therapy during the study period were identified.
- Patients were required to have received an originator biologic therapy during the 12-month baseline period prior to biosimilar initiation.
- Patients meeting validated IBD diagnosis criteria ( $\geq 1$  inpatient or  $\geq 2$  outpatient IBD diagnosis codes) were included.
- Patients were required to be  $\geq 18$  years of age as of the index date.
- Patients with continuous medical and pharmacy enrollment for  $\geq 12$  months before and  $\geq 12$  months after the index date were included in the final analytic cohort.

## Results

- The study included 4,288 adults with IBD, primarily commercially insured ( $\sim 60\%$ ) and with a low comorbidity burden (61% with Charlson Comorbidity Index = 0), providing a stable population for pre-post comparison.
- Switching from originator biologics to biosimilars was associated with a shift toward planned outpatient care, with increases in ambulatory and outpatient visits (+5.9% and +11.6%) alongside reductions in inpatient and emergency department utilization ( $-11\%$  and  $-10\%$ ).
- These utilization changes translated into meaningful cost savings, driven by lower inpatient ( $-28\%$ ), Emergency department ( $-15\%$ ), and pharmacy costs ( $-12.8\%$ ), without increased medication use.
- Average number of visits generally decreased across most care settings after biosimilar switching in all age groups, with the largest reductions observed in older patients, while ambulatory visits showed modest increases.
- NLP analysis of clinician notes indicated that switching decisions were most often driven by disease- and treatment-related factors, immunogenicity concerns, and payer coverage or reimbursement policies, adding clinical and policy context to claims-based findings.

Figure 1.2. Average Healthcare Visits/Encounters

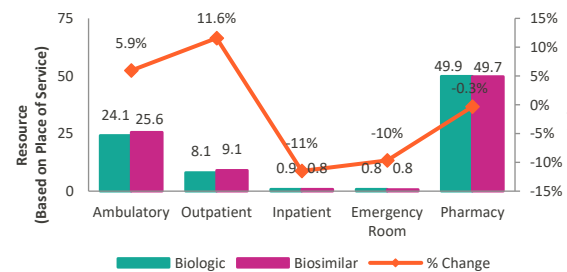


Figure 1.3. Average Healthcare Cost Utilization

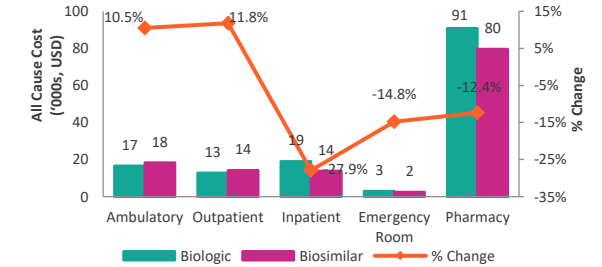


Table 1.1. Average Healthcare Visits/Encounters by Age Group

Age (Yrs)	Biologic				Biosimilar				% Change			
	18-39	40-54	55-64	65+	18-39	40-54	55-64	65+	18-39	40-54	55-64	65+
<b>Ambulatory</b>	21.15	24.18	26.55	30.26	22.12	25.69	27.91	33.07	4.6%	6.2%	5.1%	9.3%
<b>Outpatient</b>	7.38	7.6	8.38	11.22	8.06	8.63	8.98	13.22	9.2%	13.6%	7.2%	17.8%
<b>Inpatient</b>	0.86	0.81	0.9	0.96	0.7	0.81	0.79	0.92	-19%	0%	-12%	-4%
<b>Emergency Room</b>	1.03	0.75	0.64	0.59	0.86	0.8	0.51	0.6	-17%	7%	-20%	2%
<b>Pharmacy</b>	41.42	52.89	65.31	50.12	39.74	53.79	64.25	58.87	-4.1%	1.7%	-1.6%	17.5%

## Conclusions

- Biosimilar switching in IBD was associated with reduced acute care utilization and costs and stable treatment intensity, while NLP analysis of clinician notes indicated that switching was primarily driven by disease- and treatment-related considerations, immunogenicity concerns, and payer coverage or reimbursement policies.