

# Real-world bevacizumab biosimilar uptake from 2018–2023 and outcomes among patients with NSCLC and mCRC using commercial and Medicare Advantage claims in the US

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## Background

- The availability of biosimilars may make treatment with biologic therapies more accessible to patients.
- Bevacizumab biosimilar products became available starting in 2019 for treatment of various cancers.
- Bevacizumab is used in combination with various chemotherapy drugs to treat metastatic colorectal cancer (mCRC) and non-small cell lung cancer (NSCLC).

Table 1. Product approval and launch dates: Bevacizumab (Avastin) and biosimilars

Indications of interest	Non-small cell lung cancer (NSCLC), Metastatic colorectal cancer (mCRC)		
		Approval date	Launch date
Originator product	Bevacizumab (Avastin)	Feb 2004	Feb 2004
	Bevacizumab-awwb (Mvasi)	Sept 2017	July 2019
	Bevacizumab-bvzr (Zirabev)	June 2019	Jan 2020
	Bevacizumab-maly (Alimysys)	Apr 2022	Oct 2022
	Bevacizumab-adcd (Vegzelma)	Sept 2022	Apr 2023
Biosimilars*			

\*We examined bevacizumab biosimilars available during the patient identification period from 01 January 2018 to 30 September 2023

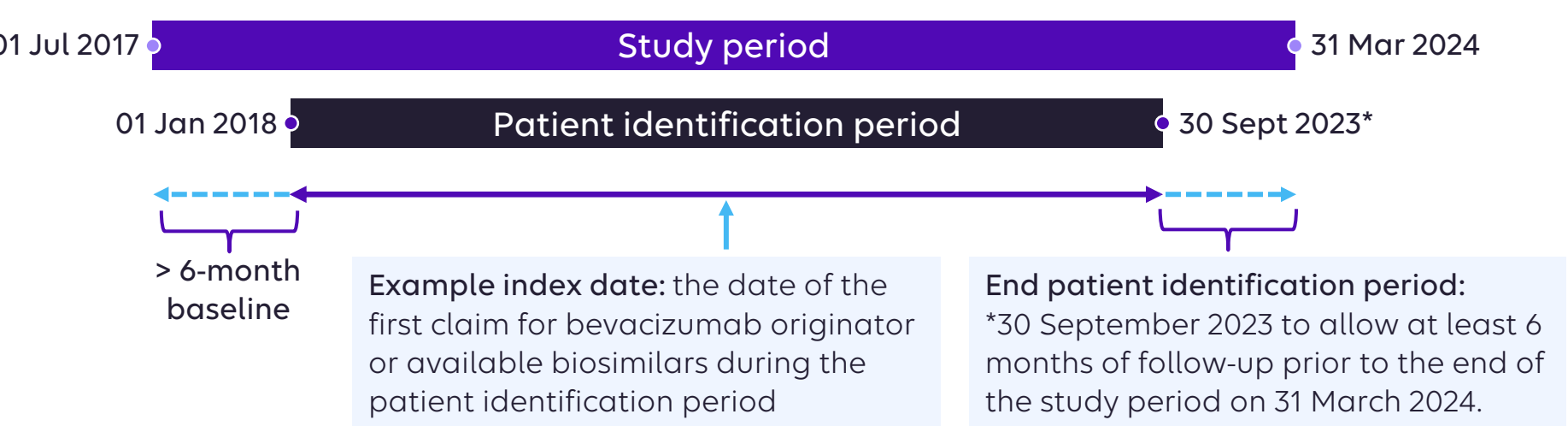
## Objectives

- To describe real-world uptake of bevacizumab biosimilars and utilization of bevacizumab originator among patients with mCRC and NSCLC from 2018–2023.
- To describe patient characteristics among users of bevacizumab originator and biosimilars.
- To examine associated safety outcomes among users of bevacizumab originator and biosimilars.

## Methods

Study design: non-interventional, retrospective study using de-identified claims data from Carelon Research’s Healthcare Integrated Research Database (HIRD®)

Figure 1. Time periods



## Patient profiles

Table 2. Baseline patient characteristics — NSCLC

	Bevacizumab (Avastin)	Biosimilars <sup>1</sup>	P-value
Number of patients, N	604	476	
Age in years, Median (IQR)	71 (61–78)	64 (56–72)	<0.001
Female Sex, n, (%)	341 (56.5%)	236 (49.6%)	0.029
Payer: Commercial health plan	334 (55.3%)	334 (70.2%)	<0.001
Race/Ethnicity: White, not Hispanic/Latino	431 (84.7%)	323 (82.4%)	0.477
Geographic region, n (%)			0.168
West	168 (28.3%)	141 (29.8%)	
Southwest	170 (28.6%)	141 (29.8%)	
East	96 (16.2%)	88 (18.6%)	
Midwest	160 (26.9%)	103 (21.8%)	
Modified-Quan-Charlson Comorbidity Index (QCI), mean (SD)	1.2 (1.36)	0.9 (1.30)	0.004

<sup>1</sup>Bevacizumab-awwb (Mvasi), Bevacizumab-bvzr (Zirabev), Bevacizumab-maly (Alimysys), and Bevacizumab-adcd (Vegzelma)  
<sup>2</sup>Only data for patients on Bevacizumab originators from 01 July 2019 to 30 September 2023 after biosimilars became available are presented.

Table 3. Baseline patient characteristics — mCRC

	Bevacizumab (Avastin)	Biosimilars <sup>1</sup>	P-value
Number of patients, N	1,374	2,474	
Age in years, Median (IQR)	59 (51–68)	58 (50–67)	0.521
Female Sex, n, (%)	642 (46.7%)	1,048 (42.4%)	0.010
Payer: Commercial health plan	1,089 (79.3%)	1,960 (79.2%)	1.000
Race/Ethnicity: White, not Hispanic/Latino	889 (78.6%)	1,632 (78.2%)	0.161
Geographic region, n (%)			<0.001
West	323 (24.2%)	587 (24.1%)	
Southwest	446 (33.4%)	913 (37.4%)	
East	172 (12.9%)	355 (14.6%)	
Midwest	394 (29.5%)	584 (23.9%)	
Modified-Quan-Charlson Comorbidity Index (QCI), mean (SD)	0.7 (1.08)	0.6 (1.05)	0.028

<sup>1</sup>Bevacizumab-awwb (Mvasi), Bevacizumab-bvzr (Zirabev), Bevacizumab-maly (Alimysys), and Bevacizumab-adcd (Vegzelma)  
<sup>2</sup>Only data for patients on Bevacizumab originators from 01 July 2019 to 30 September 2023 after biosimilars became available are presented.

## Results

Figure 2. Overall bevacizumab use among patients with NSCLC from 2018–2023, n=1,307

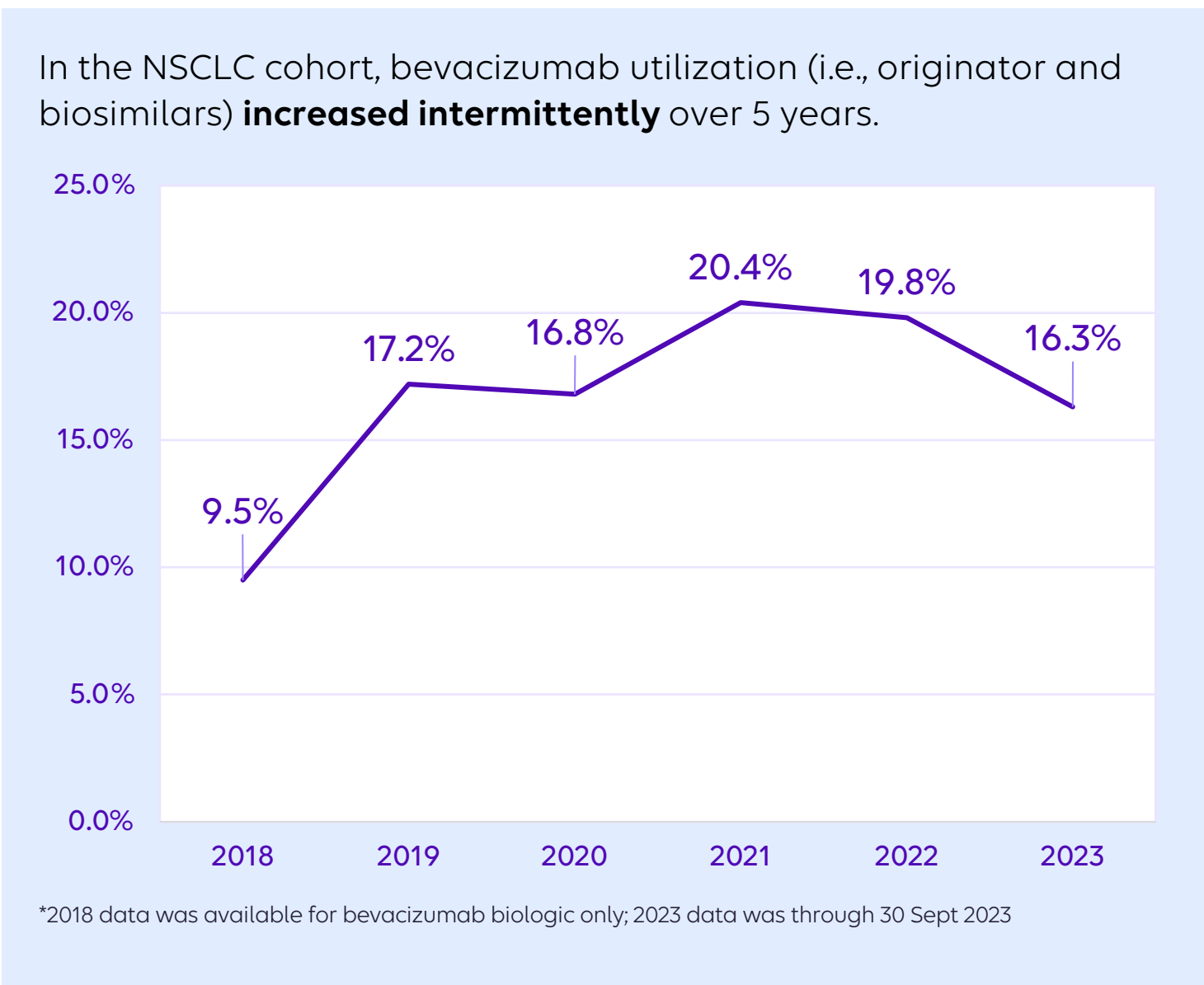


Table 4. Bevacizumab utilization among patients with NSCLC from 2018–2023

	Overall cohort	Bevacizumab (Avastin)	Biosimilars <sup>1</sup>	P-value
Number of patients, N	1,307	831	476	
Year of uptake date <sup>2</sup> , n (%)				
2018	124 (9.5%)	124 (14.9%)	0 (0.0%)	<0.001
2019	225 (17.2%)	218 (26.2%)	<11 (1.5%) <sup>3</sup>	
2020	220 (16.8%)	138 (16.6%)	82 (17.2%)	
2021	266 (20.4%)	129 (15.5%)	137 (28.8%)	
2022	259 (19.8%)	123 (14.8%)	136 (28.6%)	
2023 (Jan–Sept)	213 (16.3%)	99 (11.9%)	114 (23.9%)	

<sup>1</sup>Bevacizumab-awwb (Mvasi), Bevacizumab-bvzr (Zirabev), Bevacizumab-maly (Alimysys), and Bevacizumab-adcd (Vegzelma)  
<sup>2</sup>Proportion of patients initiating bevacizumab originators and their biosimilars in each calendar year  
<sup>3</sup>Categories with <11 patients are reported as “<11” for HIPAA protection

Figure 3. Overall bevacizumab use among patients with mCRC from 2018–2023, n=4,668

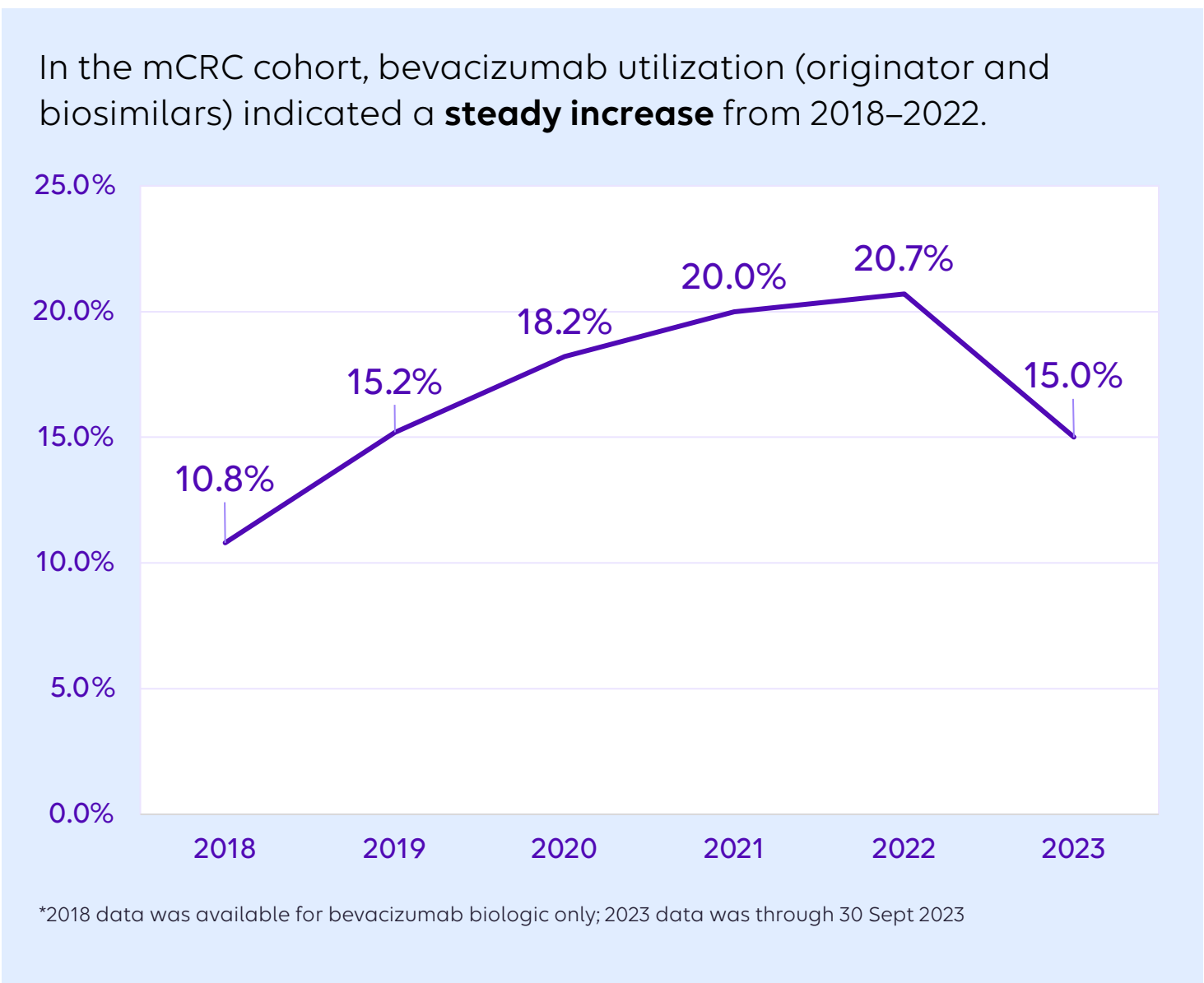


Table 5. Bevacizumab utilization among patients with mCRC from 2018–2023

	Overall cohort	Bevacizumab (Avastin)	Biosimilars <sup>1</sup>	P-value
Number of patients, N	4,688	2,215	2,474	
Year of uptake date <sup>2</sup> , n (%)				
2018	508 (10.8%)	508 (22.9%)	0 (0.0%)	<0.001
2019	714 (15.2%)	668 (30.2%)	46 (1.9%)	
2020	854 (18.2%)	430 (19.4%)	425 (17.2%)	
2021	938 (20.0%)	242 (10.9%)	696 (28.1%)	
2022	969 (20.7%)	202 (9.1%)	767 (31.0%)	
2023 (Jan–Sept)	705 (15.0%)	165 (7.4%)	540 (21.8%)	

<sup>1</sup>Bevacizumab-awwb (Mvasi), Bevacizumab-bvzr (Zirabev), Bevacizumab-maly (Alimysys), and Bevacizumab-adcd (Vegzelma)  
<sup>2</sup>Proportion of patients initiating bevacizumab originators and their biosimilars in each calendar year

## Safety outcomes

Table 6. Safety outcomes for patients treated with bevacizumab products for NSCLC and mCRC from 2018 to 2023

Safety outcomes <sup>1</sup> , n (%)	Bevacizumab (Avastin)	Biosimilars <sup>1</sup>	P-value
Number of patients with NSCLC, N <sup>3</sup>	604	476	
Cardiomyopathy/heart failure	59 (9.8%)	22 (4.7%)	0.003
Gastrointestinal perforation <sup>3</sup>	<11	<11	0.636
Thromboembolic events	38 (6.3%)	13 (2.8%)	0.011
Hemorrhage/bleeding	28 (4.7%)	30 (6.4%)	0.254
Number of patients with mCRC, N <sup>3</sup>	1,374	2,474	
Cardiomyopathy/heart failure	78 (5.7%)	116 (4.7%)	0.202
Gastrointestinal perforation <sup>4</sup>	<11	<11	.0274
Thromboembolic events	31 (2.3%)	36 (1.5%)	0.089
Hemorrhage/bleeding	134 (9.9%)	223 (9.1%)	0.475

<sup>1</sup>Safety outcomes were identified by screening for individuals with ≥1 diagnosis codes (ICD-10-CM) for each condition from treatment initiation.  
<sup>2</sup>Bevacizumab-awwb (Mvasi), Bevacizumab-bvzr (Zirabev), Bevacizumab-maly (Alimysys), and Bevacizumab-adcd (Vegzelma)  
<sup>3</sup>Only data for patients on Bevacizumab originators from 01 July 2019 to 30 September 2023 after biosimilars became available are presented.  
<sup>4</sup>Categories with <11 patients

## Limitations

- Bevacizumab is used with other anti-cancer therapies; safety outcomes may reflect combined treatment.
- Administrative claims are mainly for billing/payment; may not fully capture diagnoses/treatments due to coding issues.
- Provider preferences, behavioral health coverage, and patient-specific traits (e.g., social needs, family history), were not available leading to possible unmeasured confounding.
- The study results may not be generalizable to the overall population, since commercial and Medicare Advantage members may differ from those uninsured, underinsured, or covered by Traditional Medicare and Medicaid.

## Conclusions

- Bevacizumab biosimilar uptake increased from 2019 to 2023 while bevacizumab originator usage declined.
- Bevacizumab originator and biosimilars were used by similar patient profiles, resulting in modest differences in safety outcomes.

## Selected references

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