Budget Impact Analysis of Introduction of Bevacizumab Biosimilar in the United States from a Payer Perspective

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INTRODUCTION

- Bevacizumab is a recombinant, humanized, IgG1 monoclonal antibody (mAb) that works by inhibiting vascular endothelial growth factors (VEGF) to prevent angiogenesis, thereby reducing metastatic disease progression.
- Bevacizumab-bvzr, a biosimilar of bevacizumab, was approved by the FDA for the treatment of non-small cell lung cancer (NSCLC), renal cell carcinoma (RCC), glioblastoma (GBM), cervical cancer (CC), and colorectal cancer (CRC).
- A US physician survey showed that approximately 63~82% of physicians were likely to prescribe a bevacizumab biosimilar if available, primarily driven by similar efficacy and safety and lower cost particularly for treatment of CRC and NSCLC.[1]
- Bevacizumab-bvzr (Zirabev®) is a biosimilar approved by US FDA in 2019 for the same indications as the reference biologic bevacizumab, including NSCLC, RCC, GBM, CC, and CRC,[2] except for ovarian cancer (OC) due to orphan exclusivity of bevacizumab.
- The present study was to conduct budget impact analysis (BIA) to understand the potential financial effect of introducing bevacizumab-bvzr in a US health plan.

METHODS

- A BIA was developed using Microsoft Excel to evaluate the budget impact of bevacizumab-bvzr over a 3-year time frame from a US payer perspective by comparing the total budget between market scenarios without and with bevacizumab-bvzr.
- Target population was patients treated with bevacizumab originator for FDA-approved indications, estimated based on the number of patients initiating treatment for each year and proportion of patients discontinuing treatment over time.
- In the scenario with bevacizumab-bvzr, uptake of bevacizumab-bvzr was assumed to increase in a linear fashion following its market entry, resulting in an uptake of 23%, 46% and 70% in year 1 to 3.
- Drug cost of originator was based on average sales price (ASP) of $806 per 100mg.[3] A biosimilar discount of 20% was applied for bevacizumab-bvzr relative to originator cost.
- Cost for originator was estimated as its ASP plus 6% of the ASP.
- Cost for bevacizumab-bvzr was estimated as its own ASP plus 6% of the originator's ASP.[4]
- Scenario analyses were performed to examine the model robustness.

RESULTS

- In a hypothetical 10-million-member health plan, 503 patients were estimated to be treated with bevacizumab originator or biosimilar in year 1 and 676 and 709 in year 2 and year 3, respectively (**Table 1**).
- At a discount of 20%, switching from originator to bevacizumab-bvzr was associated with a total cost saving of $3,430,967 in year 1 ($0.03 per member per month [PMPM], $6,827 per patient per year [PPPY]) and $14,731,112 ($0.12 PMPM, $20,791 PPPY) in year 3 (**Table 1**).
- The total budget impact was primarily driven by that in CRC population, followed by NSCLC and GBM populations (**Figure 1**).
- Varying biosimilar discount to 15% and 40% resulted in a cost saving of $2,573,225 and $6,861,934 respectively in year 1 (**Table 2**).
- In the scenario where no vial sharing was assumed, the cost saving increased from $3,430,967 in year 1 in the base case to $3,724,190 (**Table 2**).
- Increasing reimbursement markup percentage from 6% in the base case to 10% would increase the total costs in scenarios with and without bevacizumab-bvzr but not change the amount of cost saving between the two scenarios (**Table 2**).

Figure 1. Total Incremental Budget Impact in Base Case Analysis, By Indication

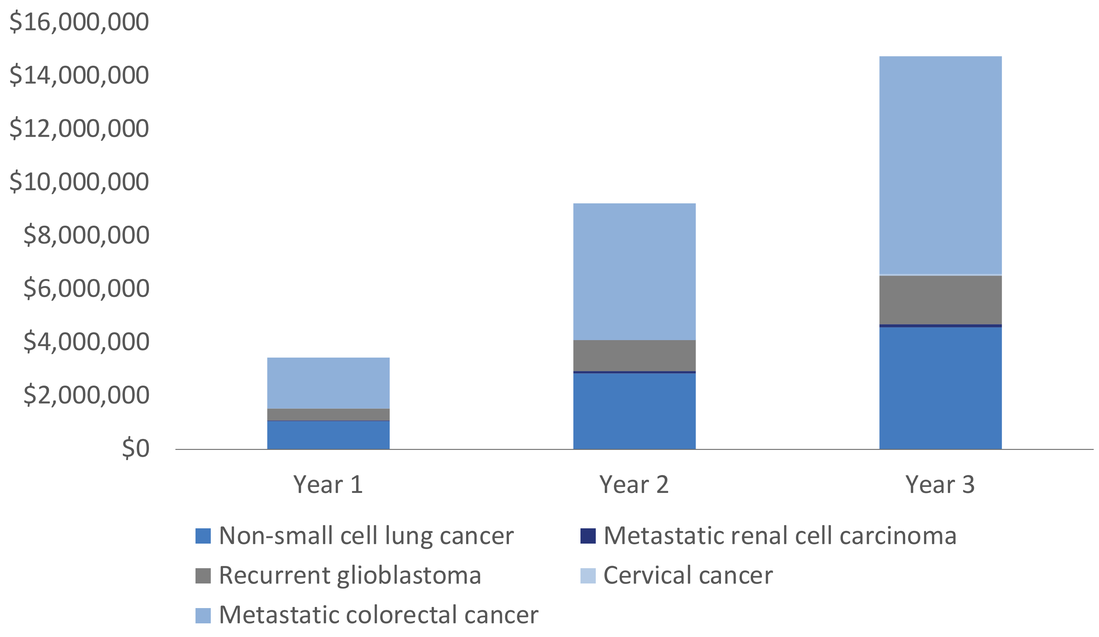

Table 1. Base Case Results

	Year 1	Year 2	Year 3
Bevacizumab biologic- or biosimilar-treated patients	503	676	709
Total Costs			
Total costs in market without bevacizumab-bvzr	$79,061,411	$106,334,207	$111,535,565
Total costs in market with bevacizumab-bvzr	$75,630,444	$97,105,201	$96,804,453
Incremental budget impact results			
Cost savings in total	$3,430,967	$9,229,007	$14,731,112
Cost savings PPPY	$6,827	$13,659	$20,791
Cost savings PPPM	$569	$1,138	$1,733
Cost savings PMPY	$0.34	$0.92	$1.45
Cost savings PMPM	$0.03	$0.08	$0.12

PMPY, per member per year; PMPM, per member per month; PPPM, per patient per month; PPPY, per patient per year.

Table 2. Sensitivity Analyses Results

	Year 1	Year 2	Year 3
Scenario: bevacizumab-bvzr discount of 15% relative to bevacizumab biologic (20% in base case)			
Total costs in market without bevacizumab-bvzr	$79,061,411	$106,334,207	$111,535,565
Total costs in market with bevacizumab-bvzr	$76,488,186	$99,412,452	$100,487,231
Cost savings in total	$2,573,225	$6,921,755	$11,048,334
Scenario: bevacizumab-bvzr discount of 40% relative to bevacizumab biologic (20% in base case)			
Total costs in market without bevacizumab-bvzr	$79,061,411	$106,334,207	$111,535,565
Total costs in market with bevacizumab-bvzr	$72,199,478	$87,876,194	$82,073,341
Cost savings in total	$6,861,934	$18,458,013	$29,462,225
Scenario: no vial sharing (vial sharing in base case)			
Total costs in market without bevacizumab-bvzr	$85,818,296	$115,402,807	$121,037,421
Total costs in market with bevacizumab-bvzr	$82,094,105	$105,386,715	$105,051,346
Cost savings in total	$3,724,190	$10,016,093	$15,986,074
Scenario: reimbursement markup of 10% relative to average sales price (6% in base case)			
Total costs in market without bevacizumab-bvzr	$82,044,861	$110,346,819	$115,744,455
Total costs in market with bevacizumab-bvzr	$78,613,894	$101,117,812	$101,013,342
Cost savings in total	$3,430,967	$9,229,007	$14,731,112

CONCLUSIONS

The results suggest a potential cost saving with switching from bevacizumab originator to bevacizumab-bvzr, driven by lower cost of bevacizumab-bvzr. The exact cost saving estimates may vary depending on extra drug rebates and proportion of patients switching to bevacizumab-bvzr.

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