The Budget Impact of the Value Regorafenib Delivers in the Treatment Landscape for Third- or Later-line mCRC in the US

Mohamedtaki Tejani[1], Jamie Grossman[2], Brian Hocum[2], Sreevalsa Appukkuttan[2], Svetlana Babajanyan[2], Alina Sichevaya[3*],Sherry Wu[3], Tanios Bekaii-Saab[4]

[1]AdventHealth Cancer Institute, Orlando, FL, USA; [2]Bayer, Whippany, NJ, USA; [3]Clinical Research Group, Evidera Inc., part of PPD clinical research business of Thermo Fisher Scientific, San Francisco, CA, USA; [4]Mayo Clinic Comprehensive Cancer Center, Phoenix, AZ, USA

BACKGROUND

- Colorectal cancer is the fourth most common cancer and the second leading cause of cancer-related mortality in the United States (US).[1] Several treatments are available including regorafenib and some newer therapies such as fruquintinib and trifluridine/tipiracil with bevacizumab.
- When patients with metastatic colorectal cancer (mCRC) progress on prior chemotherapies, national guidelines recommend regorafenib, fruquintinib and trifluridine/tipiracil with bevacizumab as next-line treatment options.
- Regorafenib has been approved for mCRC over the past decade with an established efficacy and safety profile. [2] The regorafenib dose optimization strategy (ReDOS) has shown an increase in the numbers of patients initiating a third cycle of treatment with a corresponding improvement in overall survival and lower incidence of adverse events (AEs). [3]

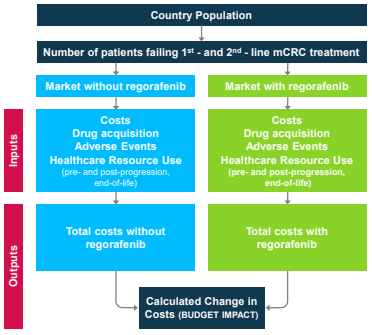
OBJECTIVES

The purpose of this analysis was to evaluate the 1-year budget impact of retaining regorafenib in the current mCRC treatment landscape in the US market from the commercial perspective.

METHODS

- A budget-impact model was developed in Microsoft Excel® to compare costs with and without regorafenib in the market from a US commercial payer perspective over 1 year. (**Figure 1**)

Figure 1. Model Structure



Abbreviations: mCRC = metastatic colorectal cancer; 1st and 2nd line = first and second line

METHODS (Cont'd)

Table 1. Model Settings and Key Parameters

	Setting/ Parameters	Value		Source/ Assumption
Epidemiology Input	CRC Incidence	30.0 per 100,000		SEER Explorer [5]
	% metastatic CRC	20.9%		Ansa et al. 2018 [6]
	% 3L+ pts.	41.0%		Bayer data on file [7]
Patient Characteristics	% male	49.6%		US Census 2024 [8]
	BSA/weight	1.9 m²/73.6 kg		Baker 2002 [9], CORRECT trial [2]
Cost Per Cycle		Treatment	Administration	Dosing: clinical trials [2,3,12,17]; Drug price: REDBOOK 2024 [11]
	Regorafenib (Standard)	$22,926	-	
	Regorafenib (ReDOS)	$20,879	-	
	Trifluridine/Tipiracil	$18,025	-	
	Fruquintinib	$38,141	-	
	Trifluridine/ Tipiracil + Beva	$22,539	$1,266	
	SOC	$88 – $13,675	$4,476 –$37,980	
Clinical Input (Median, Month)		TTD	OS	
	Regorafenib (Standard)	1.9	6.4	CORRECT Trial[2]
	Regorafenib (ReDOS)	2.8	9.8	ReDOS Trial [3]
	Trifluridine/Tipiracil	2.0	7.1	NICE TA405 [12]
	Fruquintinib	3.7	7.4	FRESCO-2 Trial [13]
	Trifluridine/Tipiracil + Beva	5.6	10.8	SUNLIGHT Trial [14]
	SOC	4.6-5.3	9.5-9.7	Assumption [15,16]
HRU Costs (Per Pt. Per Wk.)	Pre-progression/ post-progression	$9,455/$11,986		Neuberger 2023 [17]
	End-of-life (one-time)	$10,000		Assumption
AE Management Costs (Per Pt. Per 4-wks)	Regorafenib (Standard)	$1,137		Calculated based on trial reported AE incidences [2,3,12,17] and costs from HCUPNET 2021,[10] inflated to 2024 USD
	Regorafenib (ReDOS)	$1,075		
	Trifluridine/Tipiracil	$206		
	Fruquintinib	$255		
	Trifluridine/Tipiracil + Beva	$592		
	SOC	$678		

Abbreviations: AE = adverse event; Beva = bevacizumab; BSA = body surface area; CRC = colorectal cancer; HRU = healthcare resource use; OS = overall survival; pts. = patients; SOC = standard of care; TTD = time-to-treatment discontinuation; USD = US dollar; wk. = week; w/ = with; w/o = without; 3L+ = third line and plus.

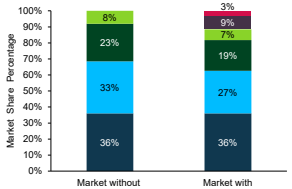
METHODS (Cont'd)

- The model includes eligible patients with mCRC who have failed two prior lines of therapy, consistent with the inclusion criteria of the CORRECT trial.[2]
- Regorafenib was analyzed using a mix of two dosing strategies: 25% of standard dose based on CORRECT trial [2] and 75% of dose escalation based on ReDOS trial.[3]
- Comparators included fruquintinib, trifluridine/tipiracil with or without bevacizumab, and other standard treatments to reflect the current landscape in the US.
- The model begins with a hypothetical population of 1 million individuals covered by a US commercial health plan. Eligible patient numbers were estimated through epidemiology calculations based on mCRC incidence and prevalence (**Table 1**).
- Cost inputs included drug acquisition, administration, and AE management, sourced from pivotal trials, literature, and publicly available cost databases. Market share assumptions were based on real-world research (**Table 1**).
- Budget impact was analyzed as total budget, cost per member per month (PMPM), and cost per treated member per month (PTMPM). One-way sensitivity analyses and scenario analyses were conducted to identify key cost drivers and evaluate alternative scenarios including healthcare resource use costs.

RESULTS

- For a hypothetical US commercial health plan with 1 million members, an estimated 26 patients would be eligible for third line and plus (3L+) treatment over a 1-year time horizon. In the scenario in which regorafenib remains in the market basket, 2.9 patients were expected to receive regorafenib instead of other treatments, based on the market forecast (**Figure 2**).

Figure 2. Market Share – Market Without Versus Market With Regorafenib



Source of market share: Bayer data on file based on physician interviews.

*The distribution[18] of standard of care includes 14.6% FOLFOX, 50.5% FOLFIRI, and 11.7% of each FOLFOX-Beva, Capecitabine + Beva and FOLFIRI-Beva.

- Retaining regorafenib in the 3L+ mCRC treatment landscape resulted in a 6% budget *decrease* of $144,364 over 1 year. The PMPM cost with regorafenib was $0.205 compared to $0.217 without it, resulting in cost savings PMPM of -$0.012 (**Table 2**).

RESULTS (Cont'd)

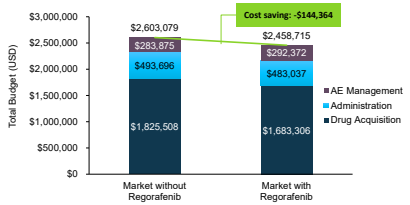
Table 2. Base Case Results – Budget Impact

Outcomes	Market without Regorafenib	Market with Regorafenib	Incremental
Eligible Patients	25.7	25.7	0.0
Regorafenib (Standard)	0.0	0.7	0.7
Regorafenib (ReDOS)	0.0	2.2	2.2
Trifluridine/Tipiracil	2.1	1.7	-0.4
Fruquintinib	6.0	4.9	-1.1
Trifluridine/Tipiracil + Beva	8.4	6.8	-1.5
SOC	9.3	9.3	0.0
Total Budget	$2,603,079	$2,458,715	$-144,364
Total Costs: PMPM	$0.217	$0.205	-$0.012
Total Costs: PTMPM	$8,432	$7,964	-$468

Abbreviations: Beva = bevacizumab; PMPM = per member per month; PTMPM = per treated member per month; SOC = standard of care.

- Drug acquisition costs had the largest budget impact (-$142,202), followed by treatment administration (-$10,659) and AE management (+$8,497). (**Figure 3**)
- Including HRU in the scenario analysis led to a 0.4% total budget decrease of -$109,309 over 1 year. PMPM cost saving decreased slightly to $0.009 due to longer post-progression survival (PPS) of regorafenib (ReDOS, median PPS = 7.0 months) compared to fruquintinib monotherapy (5.1 months),[4] trifluridine/tipiracil (FRESCO-02 trial, 3.7 months) and trifluridine/tipiracil plus bevacizumab (SUNLIGHT, 5.2 months), leading to incremental HRU costs (+$35,054).

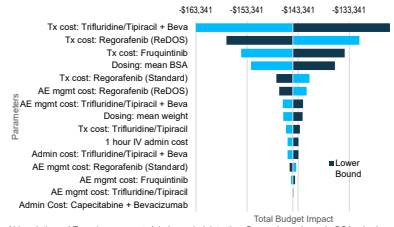
Figure 3. Total Budget Impact By Cost Category



Abbreviations: AE = adverse event; USD = US dollar

- Deterministic sensitivity analysis shows that the most influential parameters on the total budget are drug acquisition costs, dosing based on the patient's body surface area/weight, administration costs, and AE management costs (**Figure 4**).

Figure 4. One-way Deterministic Sensitivity Analysis



Abbreviations: AE = adverse event; Admin = administration; Beva = bevacizumab; BSA = body surface area; IV = intravenous; mgmt = management; Tx = treatment .

LIMITATIONS

- The treatment landscape has evolved with new drug approvals in 2023. Limited real-world market data are available to assess their long-term impact on treatment utilization in the market.
- The analysis focuses on a 1-year time horizon, which has minimal impact given the short overall survival of 3L+mCRC.

CONCLUSIONS

The analysis suggests that regorafenib as a 3L+ mCRC treatment option may lead to cost savings for a US commercial health plan. Maintaining formulary access to regorafenib supports patient outcomes and is budget conscious .

Acknowledgments

This research was funded by Bayer. Editorial and graphic design support were provided by Lauren Ransome and Richard Leason of Evidera, part of PPD clinical research business of Thermo Fisher Scientific.

References

1. Rawla P, *et al. Gastroenterology Review.* 2019;14(2):89-103.
2. Grothey A, *et al. The Lancet.* 2013;381(9863):303-12.
3. Bekaii-Saab TS, et al. The Lancet Oncology. 2019;20(8):1070-82.
4. Excellence NIHaC. TA405 submission: Trifluridine–Tipiracil for Previously Treated Metastatic Colorectal Cancer. 2016.
5. SEER. *Cancer Stat Facts:* Colorectal Cancer https://seer.cancer.gov/statfacts/html/colorect.html
6. Ansa BE CS, Alema-Mensah E, Smith SA. *Journal of Clinical Medicine.* 7(2).
7. Bayer data on file
8. US Census, Quick Fact
9. Baker SD VJ, Rowinsky EK, Donehower RC, Schellens JH, et al. Role of body surface area in dosing of investigational anticancer agents in adults, 1991–2001 *J Natl Cancer Inst.* 2002;94:1883–8.
10. HCUPnet Inpatient Stays, National Statistics by Clinical Classification Software Refined (CCSR) Principal Diagnosis. All Payer 2021 Cost.
11. Merative. Micromedex® RED BOOK®.
12. Excellence NIfHaC. *Single Technology Appraisal. Trifluridine with tipiracil hydrochloride for treating metastatic colorectal cancer after standard therapy [ID876].*
13. Dasari A, et al. *The Lancet.* 2023;402(10395):41-53.
14. Prager GW, et al. *New England Journal of Medicine.* 2023;388(18):1657-67.
15. Bang YH, et al. *Scientific Reports.* 2021;11(1).
16. Kang BW, et al. *Medical Oncology.* 2008;26(1):32-7.
17. Neuberger E, et al. *Journal of Clinical Oncology.* 2023;41(4_suppl):53-.
18. Barzi Afsaneh et al. Real-World Treatment Patterns of Patients Treated with Regorafenib or Trifluridine/Tipiracil for Metastatic Colorectal Cancer in the United States Community Oncology Setting. 2023

Presented at AMCP 2025, March 31–April 3, Houston, TX, USA.

Presented by Jamie Grossman, Bayer