



Stakeholder Perception of Pharmaceutical Value: A Multi-criteria Decision Analysis (MCDA) Educational Case Study for Value Assessment in the United States

Nicholas D. Mendola, MPH¹; Jonathan D. Campbell, PhD²; Robert Dubois, PhD³; Elisabeth Oehrlein, PhD⁴;

Eleanor Perfetto, PhD⁴; Kimberly Westrich, MA³; Robert Brett McQueen, PhD¹

¹Skaggs School of Pharmacy and Pharmaceutical Sciences, University of Colorado Anschutz Medical Campus, Aurora, CO

²Institute for Clinical and Economic Review, Boston, MA

³National Pharmaceutical Council, Washington, DC

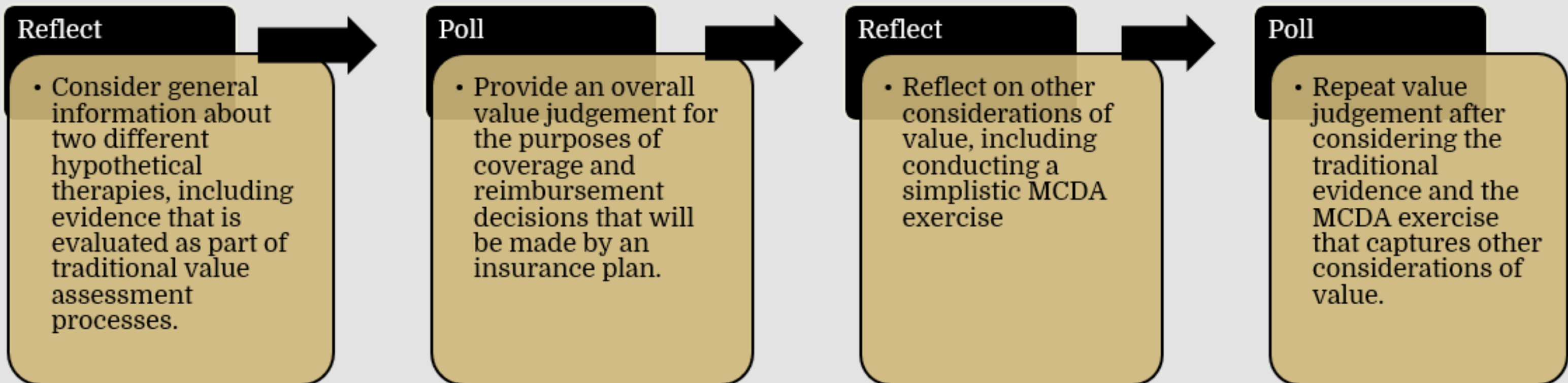
⁴National Health Council, Washington, DC



Introduction / Objective

Multi-criteria decision analysis (MCDA) is a structured decision-making process that offers flexibility to incorporate multiple objectives and criteria into a single evaluation.¹ MCDA has potential as a supplemental tool to traditional value assessment, however, education and training on MCDA in the United States is lacking². The objective of this work was to educate stakeholders on MCDA approaches in value assessment and to assess value perceptions using hypothetical treatment case examples.

Methods



Two hypothetical treatment profiles were presented to participants, each with similar cost-effectiveness evidence. One treatment was for Non-Hodgkin's Lymphoma and the other for recurring migraines. Participants were asked to rate these as being consistent with "Low", "Intermediate", or "High" value care, both before and after the use of an MCDA tool.

Criteria	Definition
First Treatment Option	The treatment is the first to offer any improvement for patients with a certain disease
Health Disparities	Potential for a treatment to reduce important inequalities across racial, ethnic, gender, socioeconomic, or regional categories
Novelty	New treatment option for patients for whom other available treatments have failed
Caregiver Burden	The burden of the caregiver's daily life, including all emotional, social, financial, and physical aspects
Real Option Value	Potential for a treatment to extend life and create opportunities to benefit from other future advances in medicine
Complexity	The potential for a treatment to be simpler than its alternatives (e.g., in administration, simpler dosing, etc.)
Level of Certainty in Safety Evidence	Knowns (and unknowns) related to safety of the treatment
Level of Certainty in Benefit Evidence	Knowns (and unknowns) related to benefit of the treatment
Productivity	The treatment offers meaningful improvements in the work productivity of the patient
Severity of Disease	The severity (e.g., impact on length of life and/or quality of life) of a disease the treatment is intended to treat
Value of Hope	Potential for a treatment to provide a chance at a "cure"

Weighting of additional non-traditional value criteria was conducted through point allocation weighting. In this exercise participants were each given ten "coins" and instructed to distribute them amongst the top five selected criteria. For example, if a participant allocated 5 coins to their top ranked criteria, then they were indicating that that top criteria should receive half of the overall weight, when computing a value score for these other important criteria

Criteria	Case 1 Treatment A in Non-Hodgkin's Lymphoma (0-100)	Case 2 Treatment B in episodic migraine (0-100)
First Treatment Option	15	5
Health Disparities	5	10
Novelty	100	50
Caregiver Burden	30	100
Real Option Value	90	0
Complexity	15	25
Level of Certainty in Safety Evidence	50	90
Level of Certainty in Benefit Evidence	20	35
Productivity	50	100
Severity of Disease	90	50
Value of Hope	100	0

$$MCDA\ Score = b_1x_1 + b_2x_2 + b_3x_3.../10$$

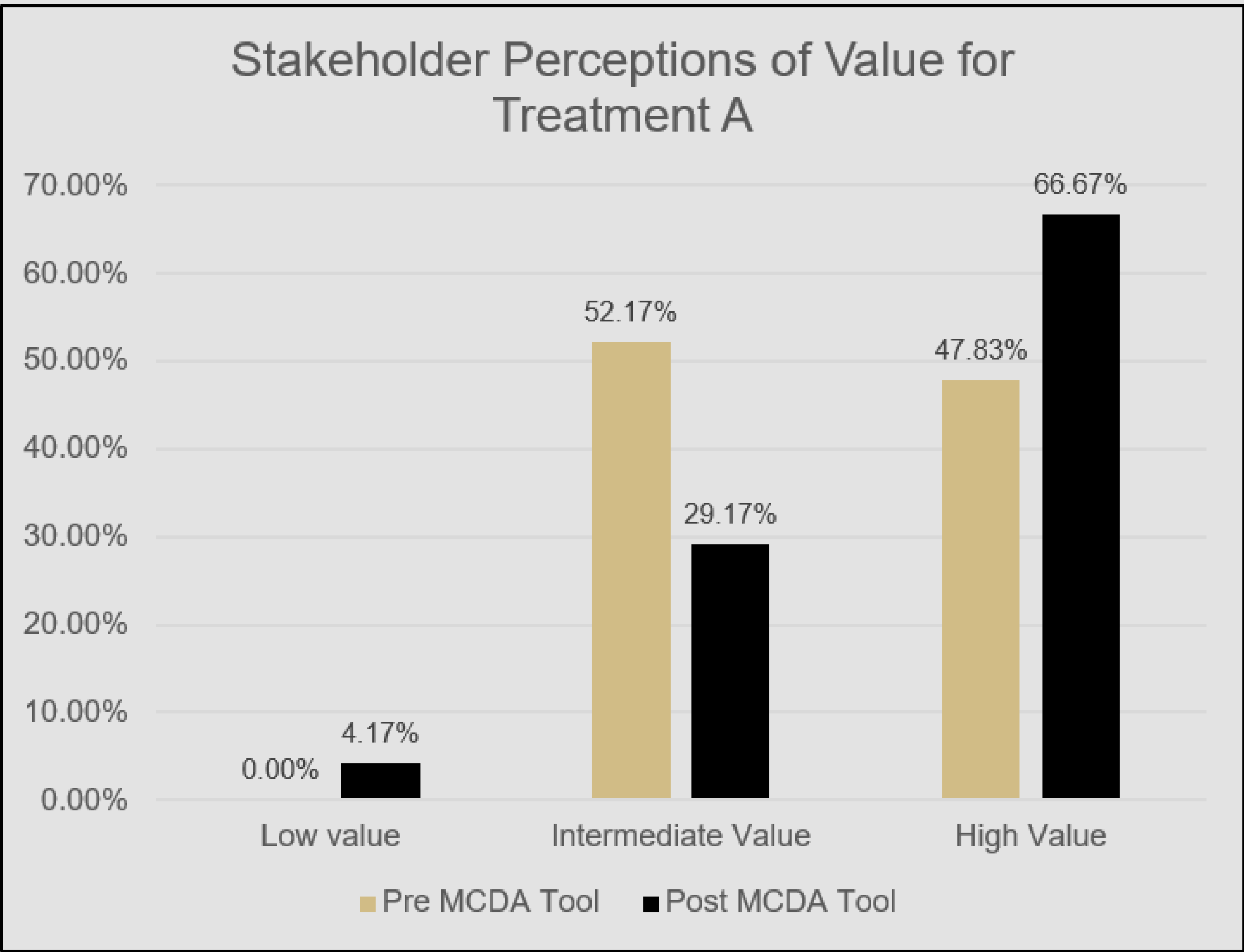
b = Criteria scoring functions
(Provided to Participants)

x = Criteria weights
(Coin Allocation Exercise)

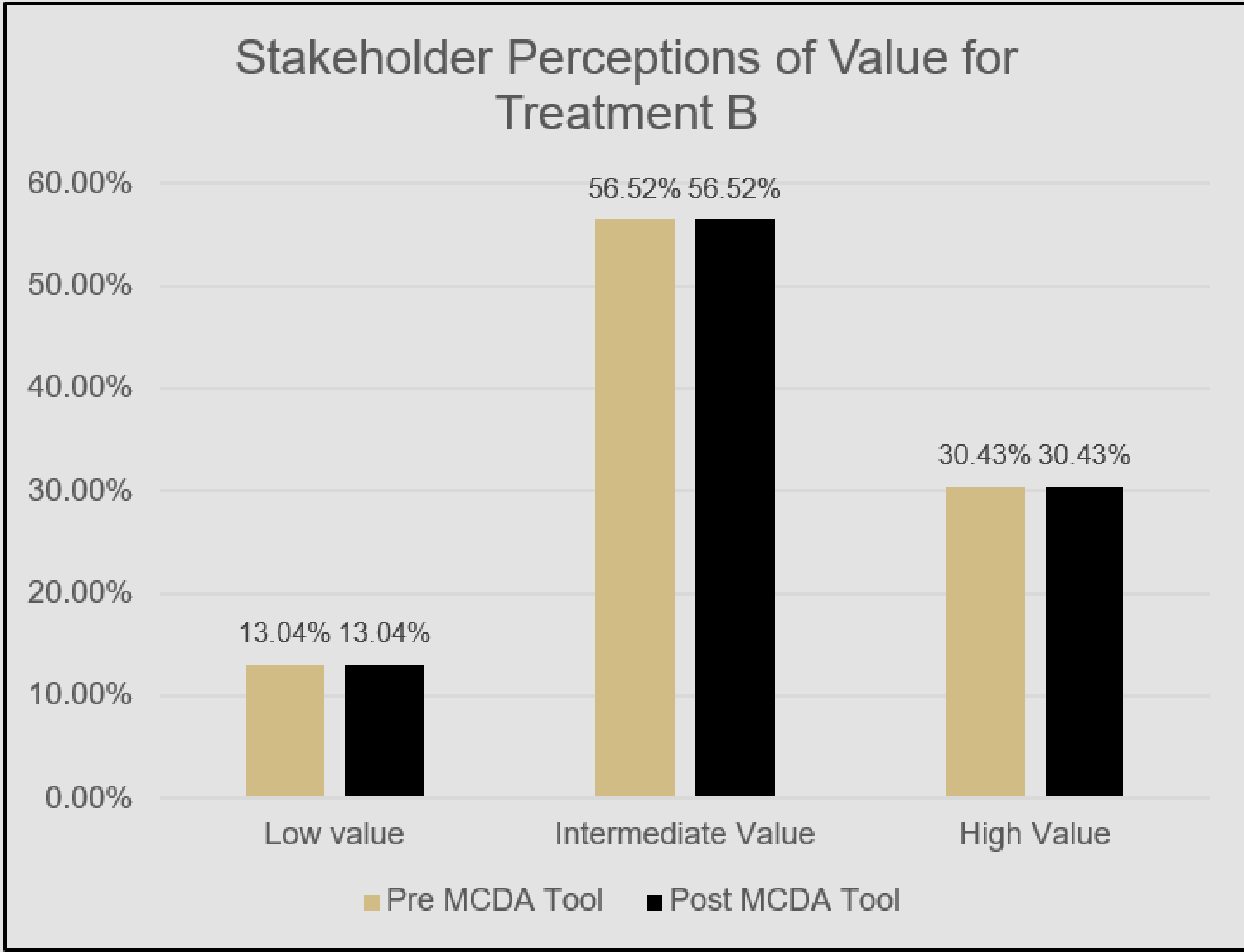
Results

Classification	Treatment A			Treatment B		
	Negative Change	No Change	Positive Change	Negative Change	No Change	Positive Change
Total	9.09%	59.09%	31.82%	22.73%	54.55%	22.73%
HTA Group	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%
Industry	0.00%	83.33%	16.67%	0.00%	66.66%	33.33%
Patient Group	20.00%	40.00%	40.00%	40.00%	30.00%	30.00%
Payer Group	0.00%	0.00%	100.00%	50.00%	50.00%	0.00%
Research/Academia	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%
Average MCDA Score	52.20	70.82	65.63	35.50	71.14	79.21

Analysis using a Wilcoxon signed rank test showed significant differences (p=0.0352) between the initial value ratings of Treatment A versus Treatment B, as well as significant differences (p=0.0164) after considerations of the treatment MCDA scores. To test whether there was a change in perception of value between Treatment A and Treatment B before and after the use of MCDA scores, we ran a logistic regression analysis with a dichotomized change in perception of value (Yes or No). For treatment A we did not see a significant association between change in value rating with overall MCDA score of treatment A (p=0.2839). Similarly, for treatment B we also did not see a significant association between change in value rating with overall MCDA score of treatment B (p=0.1155).



A Wilcoxon signed rank test showed no significant differences (p-value = 0.3984) between ratings in value before and after consideration of treatment MCDA scores for Treatment A.



A Wilcoxon signed rank test showed no significant differences (p-value > 0.999) between ratings in value before and after consideration of treatment MCDA scores for Treatment B.

Conclusion

Significant differences in perceived value between Treatment A and Treatment B, before the considering MCDA, shows that despite consistent economic evidence, Treatment A and Treatment B had different perceptions of value. suggesting nuances in other clinical evidence may have played a part in value judgements. Findings suggest nuances in other clinical evidence may play a part in value judgements. Further educational exercises and MCDA applications are needed before MCDA can be applied for V/HTA use in the United States.

Acknowledgements

The authors would like to acknowledge Jennifer Bright, MPA, Executive Director, Innovation Value Initiative (IVI), Anna Hyde, MA, Vice President of Advocacy & Access, Arthritis Foundation, and Kenny Mendez, MBA, President & Chief Executive Officer, Asthma and Allergy Foundation of America for their efforts as advisory board members contributing to the concept and refinement of this educational exercise. The authors would also like to thank the participants of the educational exercise for their thoughtful comments and feedback during the meeting day.

References

- Thokala P, Devlin N, Marsh K, et al. Multiple Criteria Decision Analysis for Health Care Decision Making; 2014; An Introduction: Report 1 of the ISPOR MCDA Emerging Good Practices Task Force. Value in Health. 2016;19(1):1-13.
- Kristensen FB, Husereau D, Huić M, et al. Identifying the Need for Good Practices in Health Technology Assessment: Summary of the ISPOR HTA Council Working Group Report on Good Practices in HTA. Value Health. 2019;22(1):13-20.

Contact

Nicholas D. Mendola, MPH
Nicholas.Mendola@CUAnschutz.edu