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MCDA Application to Oncology

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Panagiotis Orfanos is Global Health Economist in F. Hoffmann-La Roche. He has studied economics in Athens, Greece, followed by a MPhil in applied econometrics in Angers, France, and a MSc in health economics in Sheffield, UK. Panos started his career as actuarial analyst in the banking sector before moving to health economics where he has worked for over 10 years in the public sector, academia, consultancy, and the pharmaceutical industry in France, UK, Netherlands, Australia, and Switzerland.

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SECTION

1

Study Objectives and Performance Matrix

Study Objectives & Scope

- Objectives:
  - Rank alternative treatments for Crizotinib failure ALK+ NSCLC based on a comprehensive, quantitative, and transparent estimate of each treatment, generated using the Multi–Criteria Decision Analysis (MCDA) methodology.
  - Assist decision making in reimbursement of alternative treatments, based on the financial capacity of the payer and the maximisation of benefit.

	Description of Base Case
Treatment	Alecensa
Comparators	Chemotherapy (Docetaxel, Pemetrexed) , Ceritinib
Population	Adult patients with ALK positive locally advanced or metastatic Non small cell lung cancer (NSCLC) previously treated with Crizotinib
Location	Argentina
Perspective	Public healthcare system with multiple perspectives (patient, medical, payer, and industry)

MCDA Primary Criteria – Performance Matrix

Main Category	Name of Criterion	Description	Lower Value	Upper Value	Value
Efficacy	PFS	Average time per patient before the disease progresses	1.5	20	Months
	OS	Average time per patient of overall survival	3	45	Months
	% of CNS tumour response	Proportion of patients whose brain tumour does not progress	0%	67%	% of patients
Safety	Adverse Events (AE)	% of patients getting Grade 3 -5 Adverse events related to drug toxicity	0%	77%	% of Grade 3-5 AEs
Economic	Direct Cost of treatment	The direct total cost of each treatment per month (medication + administration)	1'908'200	28'306	Cost of treatment per month
	Cost savings from CNS metastasis	Cost savings for healthcare system from CNS metastasis that are avoided	0	117'121	Cost

PFS = Progression Free survival; OS = Overall survival; CNS = Central Nervous System (Brain Metastasis)

MCDA Secondary Criteria

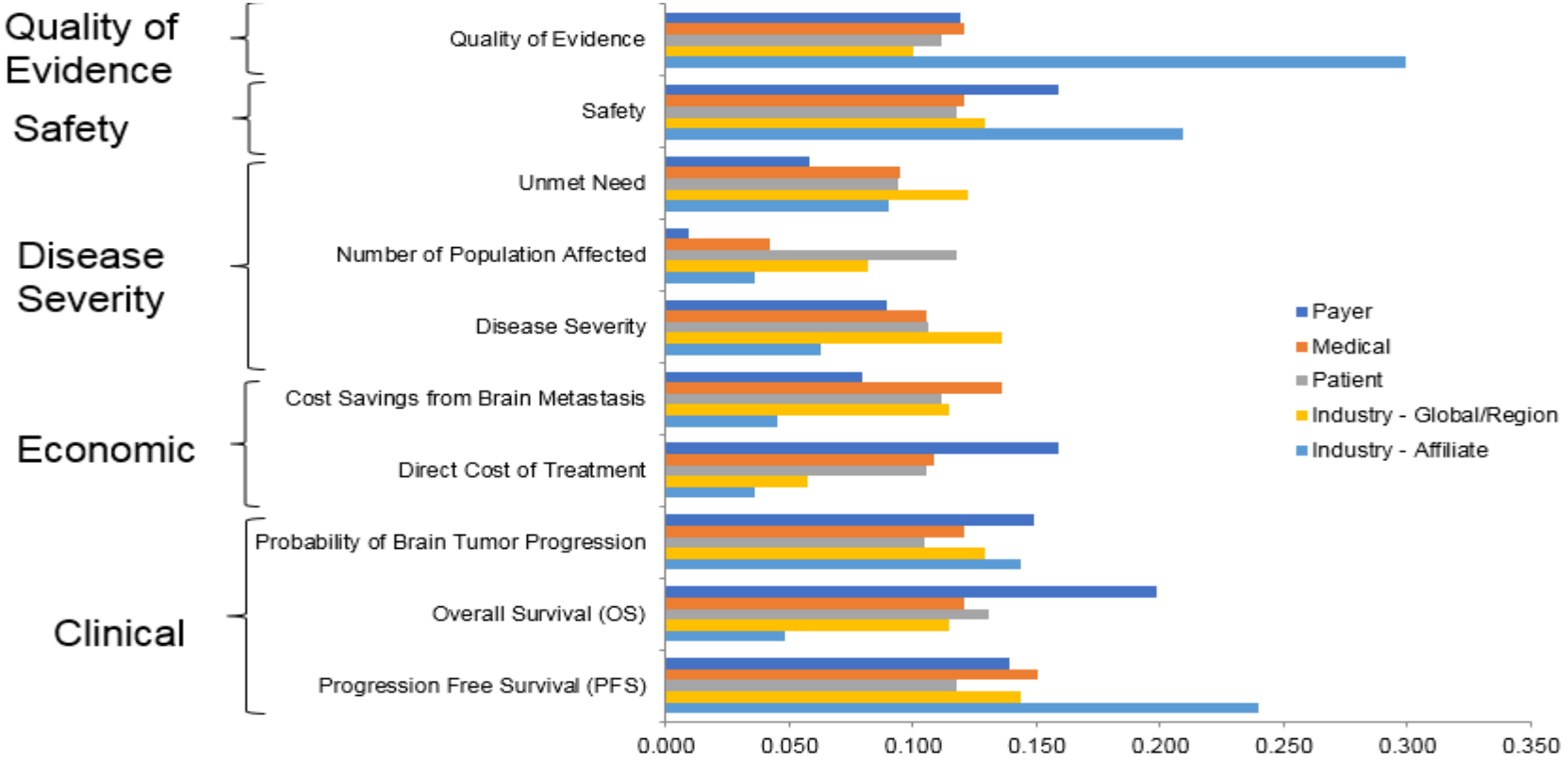
Main Category	Name of Criterion	Description	Lower Value	Upper Value
Disease Importance	Disease Severity	Taking into account that this disease affects young people (30s) who never smoked and current average survival in advanced stage is < 1year. 0 : most severe disease 100: least severe disease	0	100
	Number of Population affected **(Pre-Decided)**	7,411 patients is the estimate for Argentina 154 in Crizotinib Failure 1: Rare disease (< 200) 2: Medium disease (200 – 10,000) 3: Frequent Disease (>10,000)	1	3
	Unmet need	How would you score the existing unmet need, given the fact that patients after failing Crizotinib they currently live 5 to 10 months 0: No unmet need (existing medication perfectly covers disease) 100: No treatment exists	0	100
Quality of Evidence	Quality of evidence	How would you set the quality of evidence (100 best possible- 0 worse possible) of Alectinib vs. Ceritinib since no direct Randomized trial is available and not entirely on Argentinian setting?	0	100

SECTION

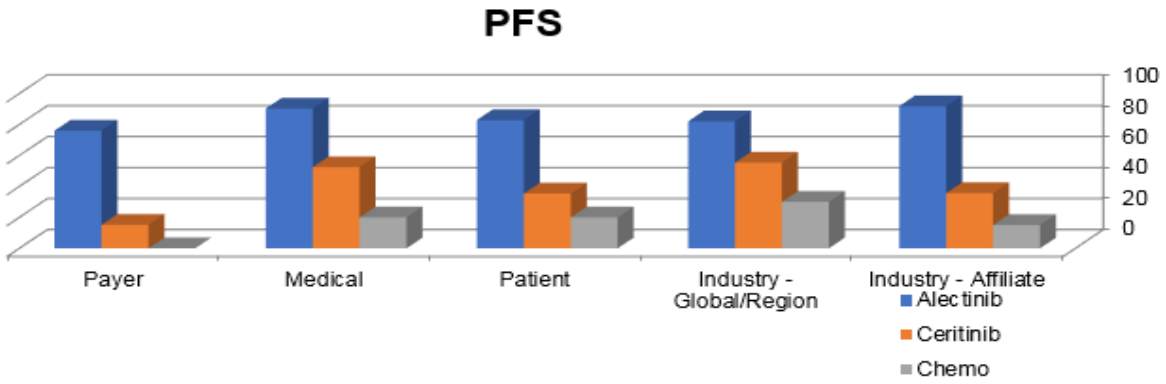
2

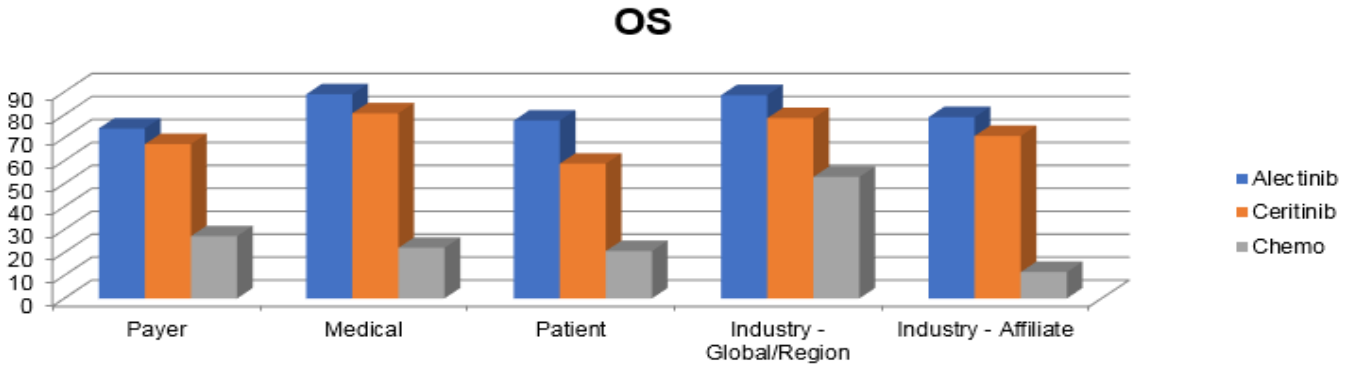
Weight and Score Elicitation

Relative Weights of Individual Criteria by Stakeholder Group

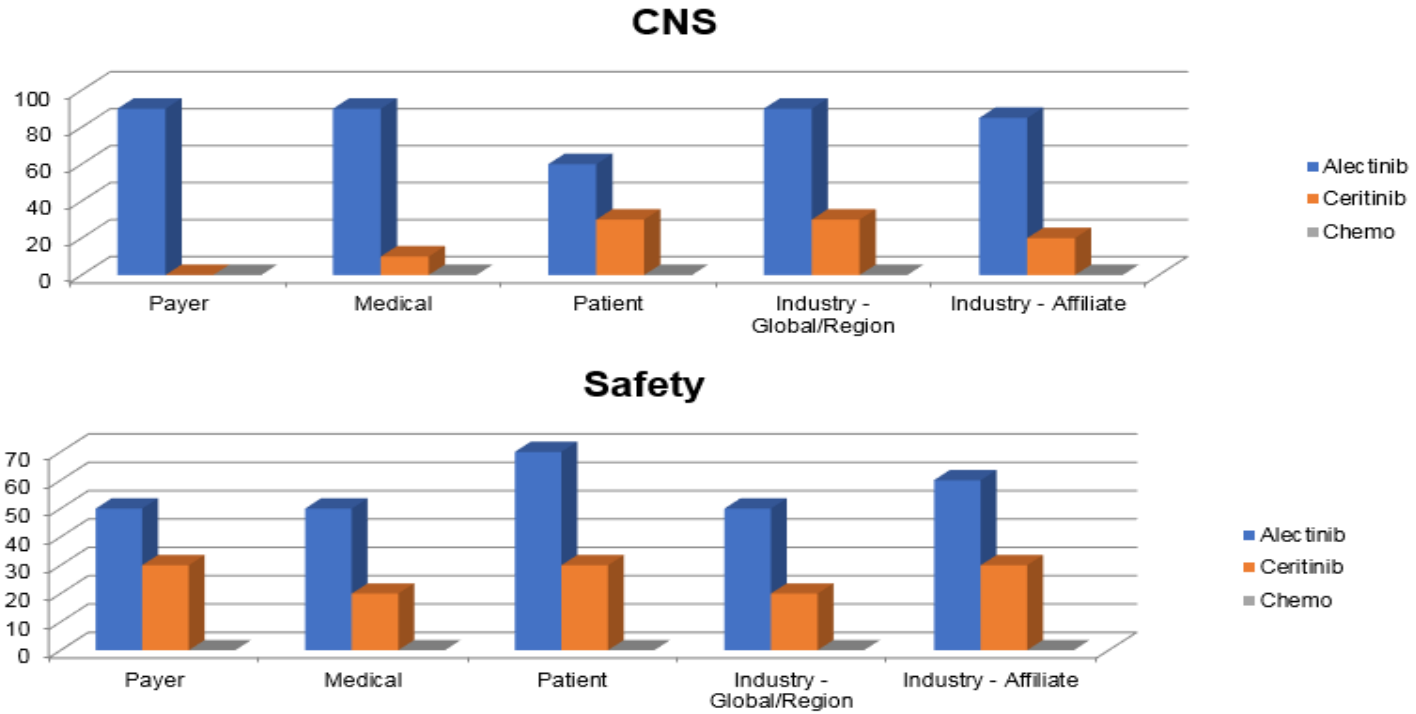


Scores - Clinical

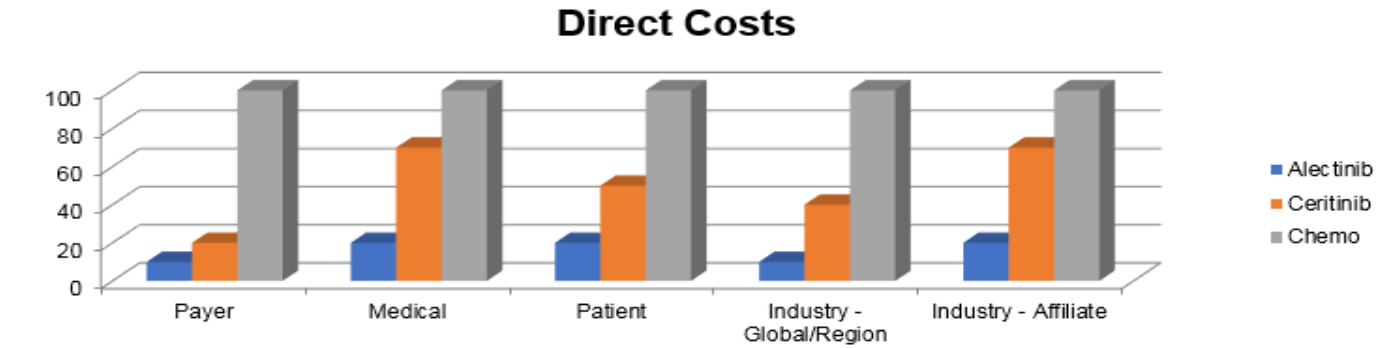




Scores – Clinical (2)



Scores - Economic



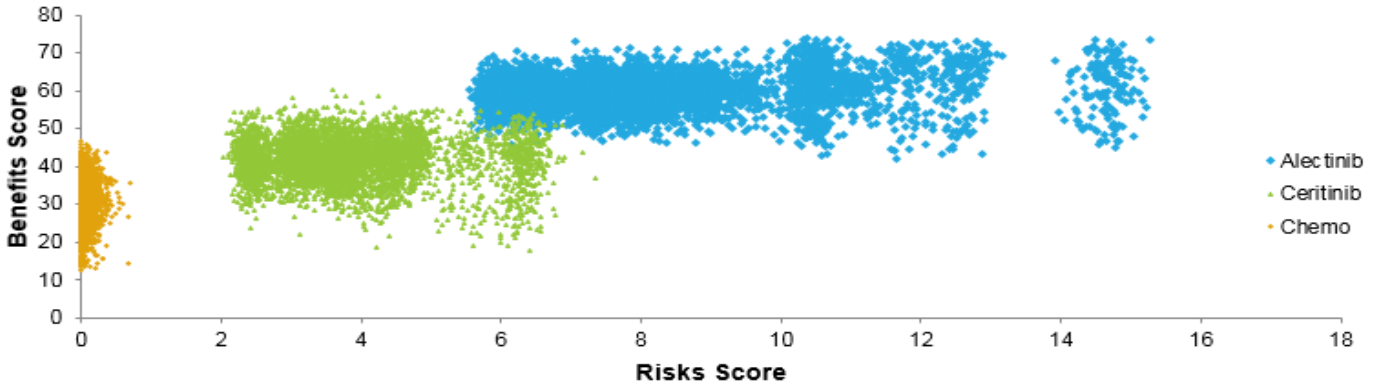
SECTION

3

Results

Results - MCDA Scores

Perspective	Alectinib	Ceritinib	Chemotherapy	Alectinib vs. Ceritinib	Alectinib vs. Chemotherapy
Payer	53.35	27.26	24.50	26.09	28.85
Medical	68.68	51.48	29.35	17.20	39.33
Patient	50.22	37.23	28.20	12.99	22.02
Industry - 1	65.75	51.38	30.33	14.37	35.42
Industry - 2	69.94	46.08	27.44	23.86	42.50
Average (all)	60.80	41.98	27.28	18.82	33.52
Average (without industry)	58.31	39.93	28.52	18.38	29.79
Average PSA* (5000 iterations)	68.23	45.67	31.72	22.55	36.50



*PSA = Probabilistic Sensitivity Analysis with 5,000 Monte Carlo Simulation, taking into account Clinical Uncertainty and Preference uncertainty among study participants

Thank you!