COST ANALYSIS OF IN-HOUSE NEXT GENERATION SEQUENCING TESTING FOR NON-SMALL CELL LUNG CANCER IN GERMANY

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Background:

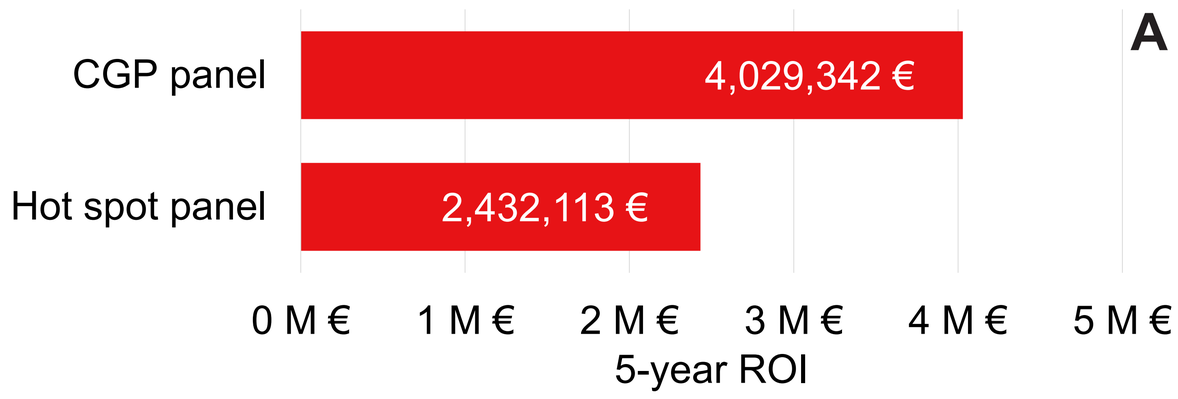
- Despite faster turnaround times; uncertainty around costs and the complexity of reimbursement may limit hospitals willingness to invest in in-house next generation sequencing (NGS) technology.
- The impact of implementing an in-house NGS system for advanced non-small cell lung cancer (NSCLC) in Germany is assessed.

Methods:

- A decision-tree model considering sample sufficiency, test success, samples per batch, and actionable findings estimated the costs and available reimbursement for running in-house NGS.
- Outcomes were the return on investment (ROI) after five years .
- Two different NGS approaches, comprehensive genomic profiling (CGP) and a hotspot panel were evaluated.
- Resource use, NGS parameters, and cost inputs (consumables, maintenance, staff, and waste disposal) were provided by a single centre in Germany.
- Capital costs were list prices and the German diagnostic-related group payment was used for the reimbursement.

Results:

- For a hospital that processes an average of 50 NSCLC samples per month, the model estimated the total cost per sample to be between €834 and €1,558, depending on the type of NGS performed.
- A payback period was achieved after 16 to 18 months, with a five-year ROI between €2,432,113 to €4,029,342. (Figure 1A-B)



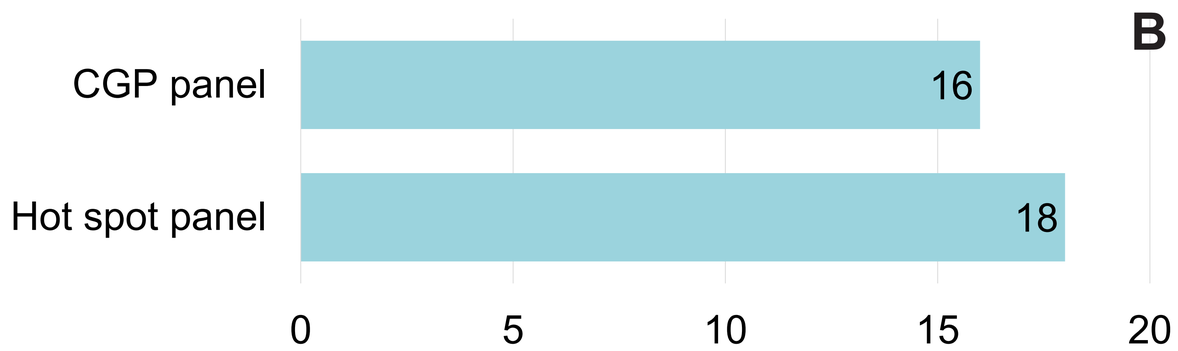


Figure 1A 5 year return on investment for two different panel sizes;
1B Pay-back period for two different panel sizes

Conclusion:

- An in-house NGS device for NSCLC profiling in Germany is expected to result in a pay-back period between 16 to 18 months.
- Increased reimbursement would likely encourage more hospitals to invest in in-house NGS.
- Results will be impacted by use of the NGS machine for other analyses that may or may not be reimbursed under the German healthcare system.

- In a scenario analysis, running 150 samples per month for OCAv3 resulted in a positive ROI after 12 months. (Table 1)
- Key drivers were the reimbursement amount for ROI (Figure 2) and the time to reimbursement for the payback period.

	50 samples per month		100 samples per month		150 samples per month	
	Five year ROI	PBP (months)	Five year ROI	PBP (months)	Five year ROI	PBP (months)
OPA	2,260,843€	18	5,018,737€	15	7,897,297€	14
OCAv3	4,373,793€	15	9,436,317€	13	19,369,684€	12

Table 1 Scenario analysis for various combinations of sample volumes and assays. OPA: Oncomine Precision Assay; OCAv3: Oncomine comprehensive assy v3; ROI: Return on investment; PBP: Pay-back period

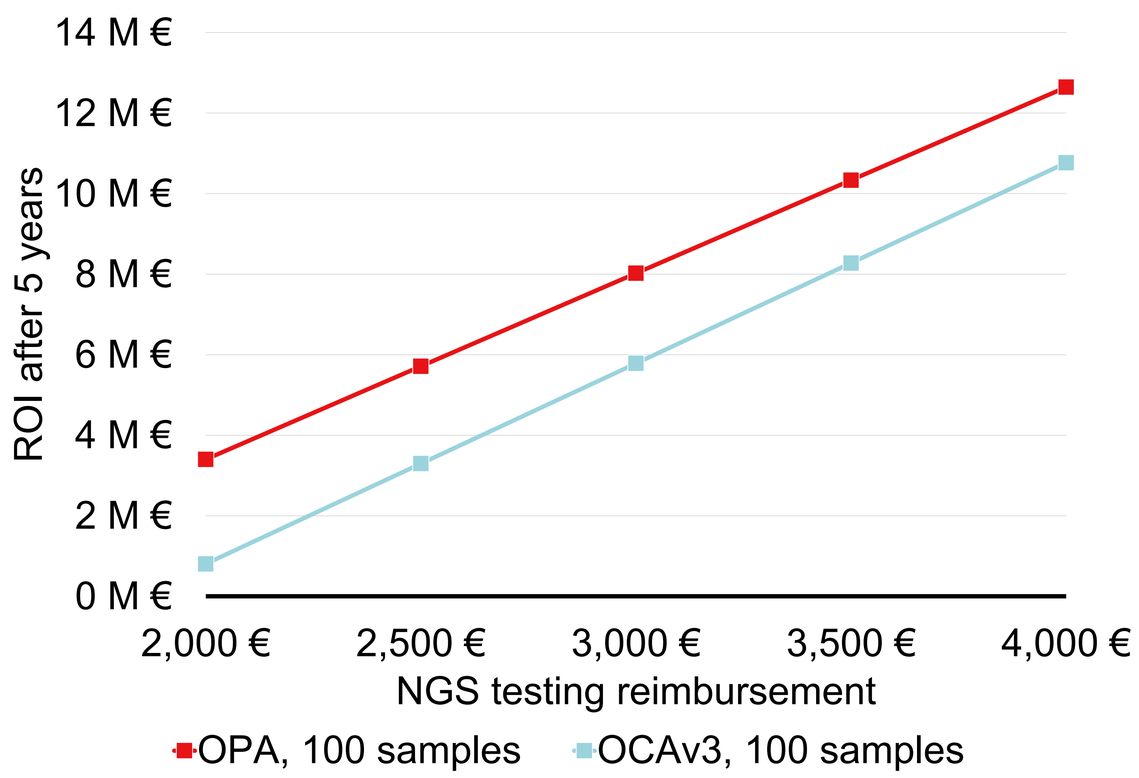


Figure 2 Relation between reimburesement and return on investment. OPA: Oncomine Precision Assay; OCAv3: Oncomine comprehensive assay v3; ROI: Return on investment

Disclaimer
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