**INTRODUCTION**

- Incorrect decisions are costly to society → value of information (VOI) analysis can help determine whether it is cost-effective to undertake further research prior to making a conclusive reimbursement decision on a new technology and if so, what type of research is most beneficial.
- This study is retrospective in nature → using published clinical trial data on erlotinib, a tyrosine-kinase inhibitor, it demonstrates how an analysis of Phase II data using VOI methods could be used to identify what data Phase III studies should focus on collecting in order to aid reimbursement decision-making.
- The analysis is conducted for an EGFR-mutation-positive advanced non-small cell lung cancer (NSCLC) patient population undergoing first line therapy.

**METHODS**

- The cost-effectiveness analysis is carried out from a UK National Health Service (NHS) perspective in a secondary care setting, using a 10-year time horizon.
- A 3-state Markov model representing progression-free disease, progressive disease, and death is used (Figure 1).
- Expected value of perfect information (EVPI) and expected value of partial perfect information (EVPPI) analyses are conducted.

**RESULTS**

- Based on the Phase II data, the mean incremental cost-effectiveness ratio (ICER) of erlotinib (intervention) vs gefitinib (comparator) is equivalent to £125,744 saved per quality-adjusted life year (QALY) lost, indicating that erlotinib is cost-effective at a threshold of £30,000 per QALY.
- Erlotinib lies in the South-West quadrant of the cost-effectiveness plane (Figure 2).

![Figure 2: Cost-effectiveness plane](image)

![Figure 3: Expected value of information](image)

![Figure 4: Expected value of perfect partial information](image)

- However, at a cost-effectiveness threshold of £30,000 per QALY, the population EVPI is £3,269,358, indicating that further research is valuable (Figure 3).
- The EVPPI identifies the efficacy parameters – the log hazards of erlotinib and gefitinib for progression-free survival and overall survival - as the parameters for which uncertainty is the most valuable (Figure 4).
- The value of the uncertainty associated with other parameters, such as utilities and costs, is much lower. Hence, subsequent studies should focus on providing further information on efficacy parameters rather than on utilities and costs.
- The results of the VOI analysis can therefore help design a more efficient hypothetical future clinical trial for erlotinib.
- Existing Phase III trials for erlotinib (EURTAC, OPTIMAL) did collect efficacy data.

**CONCLUSIONS**

- Undertaking VOI analysis on data collected at Phase II can help ensure that Phase III trials are designed efficiently, in turn ensuring that uncertainty in future decision-making is minimised.
- The use of advanced VOI methods such as the expected value of sample information (EVSI) would lend further support to the results of a preliminary VOI analysis using EVPI and EVPPI methods.
- This model demonstrated the VOI from a public policy perspective. This could be extended to other perspectives to ensure greater relevance in different settings.

**REFERENCES**