# Health economic modelling for HTA assessment, a comparison of economic protocols submitted to three HTA bodies (HAS, NICE, CADTH)

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## OBJECTIVES

Cost-effectiveness analyses are integrated in evidence-based recommendations for market access and reimbursement of new products, provided by health technology assessment (HTA) bodies, in several countries. The objective was to compare economic protocols submitted for a same product to three HTA bodies, assessing if the same cost-effectiveness analysis and methodology were implemented and if the results provided consistent ICERs.

## METHODS

We focused on the three following HTA bodies: Haute Autorité de Santé (HAS), National Institute for Health and care Excellence (NICE) and Canada's Drug and Health Technology Agency (CADTH). Thirteen HAS economic opinions assessed by the economic and public health committee (CEESP/HAS) from September 2021 to February 2022 were eligible for the analysis and selected if the health technology appraisal was available for the three HTA bodies. Comparison of economic protocols were performed using the published opinions for HAS, the Company evidence submission for NICE and the pharmacoeconomic reviews for CADTH. Methodological items were extracted using a standardized extraction grid.

## RESULTS

Among the 13 selected CEESP opinions, four were available for the three HTA bodies: EVRYSDI® (spinal muscular atrophy)[1,2,3], VENCLYXTO® (acute myeloid leukemia)[4,5,6], KEYTRUDA® (metastatic colorectal cancer (MCC)[7,8,9,10] and esophageal cancer (OC) [11,12,13]).

The results of the review of the methodological items are shown in the following table. Common items between the three HTA submissions were materialized by "✓" while "✕" indicate that items were not consistent between submissions.

### TABLE 1: COMPARISON OF ECONOMIC PROTOCOLS

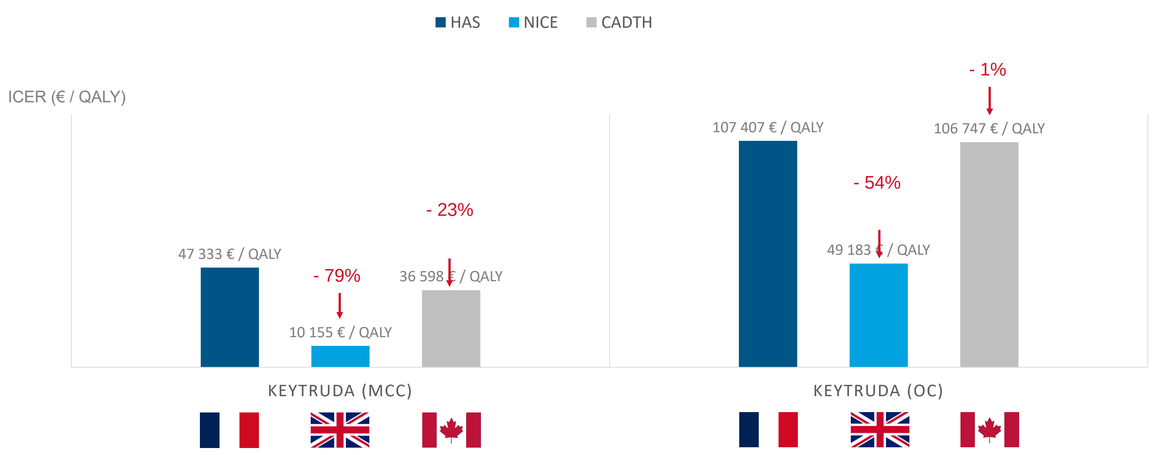
| Produit | EVRYSDI® | VENCLYXTO® | KEYTRUDA® (MCC) | KEYTRUDA® (OC) |
|---|---|---|---|---|
| Indication / objective | ✓ | ✕ | ✓ | ✓ |
| Time horizon | ✕ | ✕ | ✕ | ✕ |
| Analysis population | ✓ | ✕ | ✓ | ✓ |
| Comparators | ✕ | ✕ | ✕ | ✓ |
| Model structure | ✓ | ✕ | ✕ | ✓ |
| Simulated population | ✓ | ✕ | ✓ | ✓ |
| Efficacy data sources | ✕ | ✕ | ✕ | ✓ |
| Transition probabilities / progression free survival | ✓ | ✕ | ✕ | ✕ |
| Mortality or overall survival | ✓ | ✕ | ✕ | ✓ |
| Treatment duration | ✓ | ✓ | ✕ | ✓ |
| Utility data | ✕ | ✕ | ✕ | ✕ |
| Total consistent items | 7 | 1 | 3 | 8 |

### COMPARISON OF ICERs

ICERs were not presented or invalidated by the CEESP for EVRYSDI® and VENCLYXTO® for the following reasons:

- EVRYSDI®: ICER invalidated by the CEESP given a major global uncertainty,
- VENCLYXTO®: Objectives of the cost-effectiveness analysis (CEA) were different.

### FIGURE 1: ICERs ESTIMATED IN EACH DOSSIER

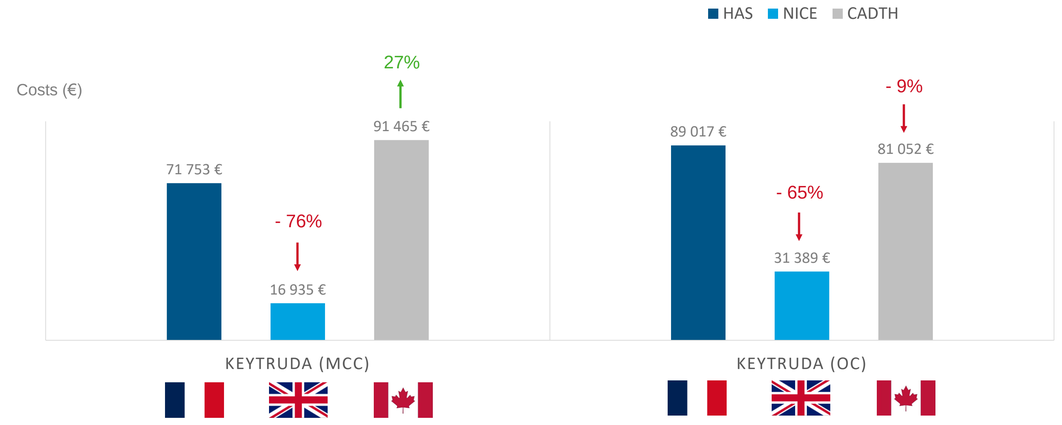



- ICERs appear lower for NICE in both KEYTRUDA® opinions with a variation of - 79% and - 54 % for MCC and OC respectively.
- For KEYTRUDA® (MCC), ICERs are not consistent between HAS and CADTH with a variation of 23%. This is consistent with the fact that only 3 methodological choices were common between the dossiers.

For KEYTRUDA® (OC), ICERs can be considered consistent between CEESP and CATDH (variation of 1%) related to the nine methodological choices that were common between the two HTA bodies.

Comparison in terms of incremental QALYs, LYs and costs were presented to understand which components have the most impact on the ICER. The variation is estimated considering the CEESP dossier as the reference.

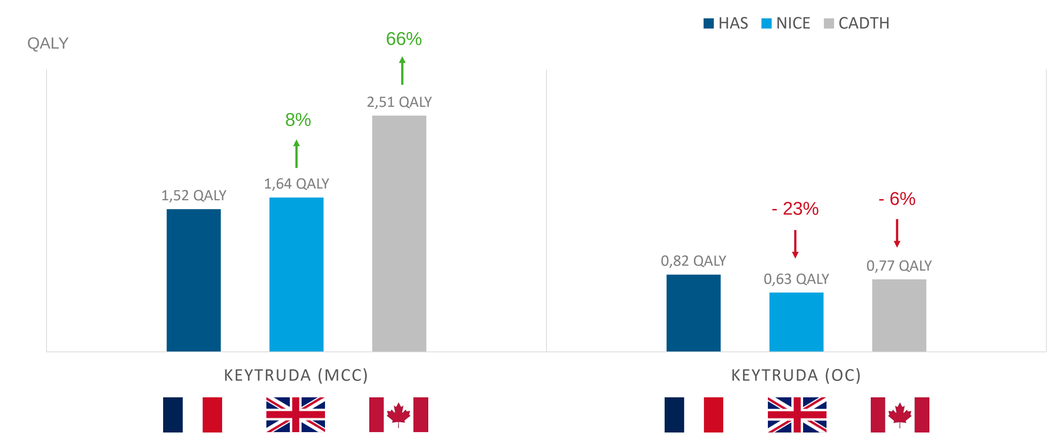
### FIGURE 2: INCREMENTAL COSTS ESTIMATED IN EACH DOSSIER




Costs appears lower for NICE submission, while there is a heterogeneity in terms of costs variation between CEESP and CADTH submissions for both products.

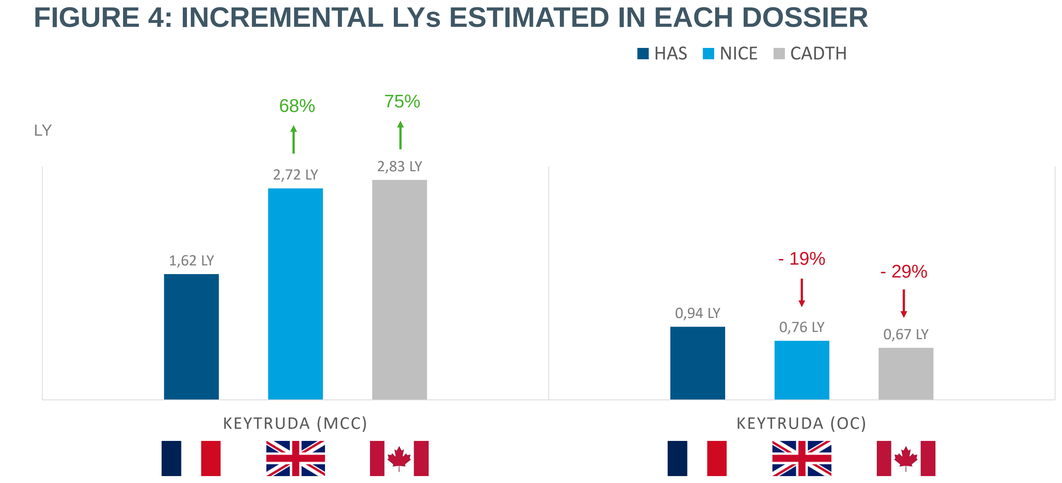
Comparison of incremental QALYs is presented below.

### FIGURE 3: INCREMENTAL QALYs ESTIMATED IN EACH DOSSIER




Comparison of incremental LYs is presented below.

### FIGURE 4: INCREMENTAL LYs ESTIMATED IN EACH DOSSIER




### KEYTRUDA® (MCC)

Lower ICER for NICE submission seem to be driven by lower costs. Lower ICER for CADTH submission is driven by health benefits especially related to different extrapolation methods for survival, as presented in table 1.

### KEYTRUDA® (OC)

As for MCC indication, lower ICER for NICE submission is related to lower costs.

## CONCLUSION

**Heterogeneity is observed in cost-effectiveness analyses submitted for a same product to the three considered HTA bodies to fulfill specific expectations and guidelines. Different structural choices or hypotheses lead to heterogenous ICERs estimations, key driver for evidence-based guidance and reimbursement process.**

**Even though the analysis has been performed on a small sample, lower ICERs for NICE submissions seem to be correlated to lower costs than in other countries. This is consistent with the existence of a willingness to pay threshold in UK.**

**Regarding CEESP and CADTH evaluations, if economic protocols for CEA are similar, in particular with regard to the modelling of health benefits, consistent levels of ICERs are observed.**

**Abbreviation**: CADTH: Canada's Drug and Health Technology Agency; CEA: cost-effectiveness analysis HAS: Haute Autorité de Santé; HTA: health technology assessment; ICER: incremental cost efficacy ratio; LY: life years; MCC: metastatic colorectal carcinoma; NICE: National Institute for Health and Care Excellence; OC: esophageal carcinoma; QALY: quality adjusted life years

1. https://www.has-sante.fr/upload/docs/application/pdf/2021-10/evrysdi_20072021_avis_economique.pdf
2. https://www.nice.org.uk/guidance/ta755/evidence/appraisal-consultation-committee-papers-pdf-10895910013
3. https://www.cadth.ca/sites/default/files/DRR/2021/SR0661-combined-report-final.pdf
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