To What Extent Are Oncology Submissions to the National Institute for Health and Care Excellence (NICE) Incorporating a Probabilistic Base Case?

van der Linde L¹, Kroi F¹, Wigfield P¹ ¹Cytel, Inc., Rotterdam, The Netherlands

Background

- NICE evaluates and produces guidance for healthcare interventions within England and Wales. The current manual, which aids health technology evaluations, was last updated in 2022.¹ Many health technology assessment bodies outside of England and Wales also consider these methods to help inform their own reimbursement decisions.²
- The updated NICE manual recommends the use of a probabilistic base case and probabilistic scenario analyses within cost-effectiveness evaluations.¹ This marks a significant shift compared to the previous emphasis on incorporating deterministic analyses as the base case. Probabilistic analyses enable uncertainty in the model parameters to be considered, thereby reducing bias in the evaluation process.³ The manual also states that manufacturers can opt for a deterministic approach, yet this deviation must be clearly justified within the submission.¹

Results (continued)

- **Table 1** presents an overview of the eight TAs that utilized a probabilistic base case in line with NICE guidance, along with the manufacturer's rationale, EAG/Committee critique and the outcome from the respective submission.
- Six TAs incorporated probabilistic base case analyses in the first half of 2024 (Jan-May), compared to two TAs in 2023. Figure 2 provides an overview of oncology TAs that were submitted and included a probabilistic base case over time. TAs that were published more recently tend to incorporate only a probabilistic base case (TA951, TA954, TA962).4-6 This is in contrast to TAs that were published in 2023 and in early 2024 that incorporated both a deterministic and



Although the current NICE manual recommends the use of a probabilistic base case and scenario analyses, it is unclear the extent to which manufacturers are following these guidelines and the implications for decision-making.

Objective



To evaluate the extent to which oncology submissions to NICE are including a probabilistic base case and scenario analyses within economic evaluations in line with current guidelines.

Methods

Targeted literature review

- A targeted literature review was conducted of NICE Technology Appraisals (TAs) published between January 2023 and May 2024 (i.e., after publication of the NICE manual).
- Eligible TAs were included for review if they were published within this timeframe, had an oncology indication, had publicly available Committee papers, and incorporated a probabilistic base case analysis.
- Screening and data extraction were conducted by two independent reviewers. Any outstanding issues were resolved with the help of a third independent assessor.

- probabilistic base case.⁷⁻¹¹
- The majority of the TAs that incorporated a probabilistic base case did not provide any reference or rationale, and the EAG or committee did not provide any specific critique.
- Two submissions (i.e., TA911 and TA944) conducted also probabilistic scenario analyses.^{8,9} Figure 3 provides an overview of the parameters assessed in each TA. The main parameters assessed included the distributions for the parametric survival curves extrapolation, time-to-treatment discontinuation costs and treatment wastage assumptions. According to TA911, only parameters with "greater uncertainty" were included within probabilistic scenario analyses to reduce computational burdens.⁸ Only a few scenario analyses in TA911 were conducted probabilistically (5/15), whilst the majority were investigated deterministically (10/15).
- TA948 considered running probabilistic scenario analyses, but opted to conduct the scenario analyses deterministically as the base case probabilistic results and deterministic results were similar.¹⁰ The EAG and Committee reported no critique regarding this decision.

Abbreviations: OS, overall survival; PFS, progression-free survival; TA, technology appraisal; TTD, time-to-treatment discontinuation; SA, scenario analysis.

Table 1. Oncology TAs reporting a probabilistic base case from January 2023 to May 2024

#	TA	Published date	Indication	Base case	Manufacturers rationale	EAG/Committee critique	Probabilistic SA	Decision
1	TA909 ⁷	07-2023	Lung	Both probabilistic and deterministic	N/A	N/A	No	Not recommended
2	TA911* ⁸	07-2023	Lung	Both probabilistic and deterministic	N/A	N/A	Yes, partially	Recommended
3	TA944* ⁹	01-2024	Biliary tract	Both probabilistic and deterministic	N/A	N/A	Yes	Recommended
4	TA948 ¹⁰	01-2024	Bile duct	Both probabilistic and deterministic	Mentioning updated NICE manual	N/A	No, but did consider**	Recommended
5	TA950 ¹¹	02-2024	Melanoma	Both probabilistic and deterministic	N/A	N/A	No	Recommended
6	TA951 ⁴	02-2024	Prostate	Probabilistic	Mentioning updated NICE manual	N/A	No	Recommended
7	TA954 ⁵	03-2024	Lymphoma	Probabilistic	N/A	N/A	No	Recommended
8	TA962 ⁶	03-2024	Ovarian, fallopian tube and peritoneal	Probabilistic	Mentioning updated NICE manual	N/A	No	Recommended

- The following data items were systematically extracted:
 - TA information (reference number, publication date, date of last update)
 - oncology indication
 - whether a probabilistic base case was included
 - o whether probabilistic scenario analyses were included
 - o manufacturer rationale for inclusion or exclusion of the above
 - o external assessment group (EAG) and Committee critique regarding inclusion/exclusion of probabilistic analyses
 - o impact on the overall reimbursement decision

Results

• Of 791 TAs identified in the NICE database, 8 TAs met the inclusion criteria and were included within this review (see PRISMA diagram shown in **Figure 1**).



Footnote: *TA911 and TA944 included probabilistic scenario analyses, the parameters of which are shown in more detail in Figure 3

**Manufacturer decided to conduct the scenario analyses deterministically as the base case probabilistic results and deterministic results were close – no critique from the EAG/Committee regarding this decision

Abbreviations: EAG, External assessment group; N/A, not available; NICE, National Institute for Health and Care Excellence; TA, technology appraisal.

Figure 2. Technology appraisals in oncology published from January 2023 to May 2024



Conclusions



- Despite NICE's current guidelines, a limited number of oncology TAs utilized probabilistic base cases and scenario analyses within their health technology submissions.
- There is currently a lack of justification from manufacturers for deviating from NICE guidance as well as limited criticisms from assessors.
- Though adherence to guidelines does seem to

Abbreviations: NICE, National Institute for Health and Care Excellence ; TA, technology appraisal.

Abbreviations: TA, technology appraisal.

be improving, more time is needed to fully capture and understand the implications that non-adherence may bring.

References

1. NICE. NICE health technology evaluations: the manual. 2022 Jan 31. 2. Angelis A, et al. Value Health. 2023 Oct;26(10):1503-1509. 3. Squires H, et al. Value in Health. 2023 Dec 1;26(12):1738-43. 4. NICE. Technology appraisal guidance [TA951]. Feb 2024. Accessed online. 5. NICE. Technology appraisal guidance [TA954]. Mar 2024. Accessed online. 6. NICE. Technology appraisal guidance [TA962]. Mar 2024. Accessed online. 7. NICE. Technology appraisal guidance [TA909]. Jul 2023. Accessed online. 8. NICE. Technology appraisal guidance [TA911]. Jul 2023. Accessed online. 9. NICE. Technology appraisal guidance [TA944]. Jan 2024. Accessed online. 10. NICE. Technology appraisal guidance [TA948]. Jan 2024. Accessed online. 11. NICE. Technology appraisal guidance [TA950]. Feb 2024. Accessed online.

Disclosures

This study was investigator-initiated and received no funding

