Economic modeling of adjuvant or neoadjuvant therapies in oncology: HTA review of NICE technology appraisals, 2019-2022

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Introduction

- Many therapies have been approved as adjuvant or neoadjuvant treatments for early-stage cancer
- However, economic evaluation of these neoadjuvant and adjuvant therapies faces unique challenges, such as overall survival (OS) immaturity from clinical trials

Objectives

- To review the technology appraisals (TA) of adjuvant or neoadjuvant cancer therapies recently published by the National Institute for Health and Care Excellence (NICE)

Methods

- We searched TAs in the NICE website with search terms of “adjuvant” or “neoadjuvant,” status of “published,” and published year of 2019-2022
- The initial and the updated TAs were counted as one TA
- Published documents were reviewed and summarized with a focus on:
  - Model structure
  - Early clinical endpoints
  - Long-term treatment effect
  - Final recommendations

Results

- **Thirteen TAs** were identified (**Figure 1**):
  - Pembrolizumab (N=4) and nivolumab (N=3) as the most frequently evaluated therapies
  - Breast cancer (N=5) and melanoma (N=3) as the most relevant cancer types
  - Adjuvant setting (N=12) and neoadjuvant setting (N=1)
- **Model structures** varied regarding the number of health states, with 4 health states being commonly considered (**Figure 2**):
  - Recurrence-free, local recurrence, distant metastasis, death
- **OS was immature** in all TAs, including 5 where OS was not available (**Figure 3**)
  - Evidence for the use of early clinical endpoints and validations of modeled long-term survival were provided and examined in most TAs
- **Long-term treatment effect** was modeled beyond the follow-up period of the trial
  - Waning (N=7) and cure (N=7, in more recent TAs) were explored in the base-case and scenario analyses (**Figure 4**)
- **Positive recommendations** were granted in all TAs (**Figure 5**):
  - Nine for routine use
  - Two initially entering the Cancer Drugs Fund (CDF), then for routine use
  - Two currently available via the CDF

References

1. Pembrolizumab for adjuvant treatment of completely resected stage 3 melanoma (2018). NICE TA553
2. Nivolumab for adjuvant treatment of completely resected melanoma with lymph node involvement or metastatic disease (2019). NICE TA558
3. Pertuzumab for adjuvant treatment of HER2-positive early stage breast cancer (2019). NICE TA569
4. Neratinib for extended adjuvant treatment of hormone receptor-positive, HER2-positive early stage breast cancer after adjuvant trastuzumab (2019). NICE TA612
5. Trastuzumab emtansine for adjuvant treatment of HER2-positive early breast cancer (2020). NICE TA632
6. Nivolumab for adjuvant treatment of completely resected melanoma with lymph node involvement or metastatic disease (2021). NICE TA684
7. Nivolumab for adjuvant treatment of resected oesophageal or gastro-oesophageal junction cancer (2021). NICE TA746
8. Osimertinib for adjuvant treatment of EGFR mutation-positive non-small-cell lung cancer after complete tumour resection (2022). NICE TA761
9. Pembrolizumab for adjuvant treatment of completely resected stage 3 melanoma (2022). NICE TA766
10. Abemaciclib for adjuvant treatment of hormone receptor-positive, HER2-negative, node-positive early breast cancer (2022). NICE TA810
11. Nivolumab for adjuvant treatment of invasive urothelial cancer at high risk of recurrence (2022). NICE TA817
12. Atezolizumab for adjuvant treatment of resected non-small-cell lung cancer (2022). NICE TA823
13. Pembrolizumab for adjuvant treatment of renal cell carcinoma (2022). NICE TA830
14. Pembrolizumab for adjuvant treatment of resected stage 2B or 2C melanoma (2022). NICE TA837
15. Pembrolizumab for neoadjuvant and adjuvant treatment of triple-negative early or locally advanced breast cancer (2022). NICE TA851

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Conclusions

Challenges such as OS immaturity persist in the economic evaluation of early-stage oncology

Modeling approaches supported by scientific evidence, efforts to examine uncertainty, and plausible cost-effectiveness will help justify the value of these cancer therapies for patient access

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Figure 1. Characteristics of the identified appraisals

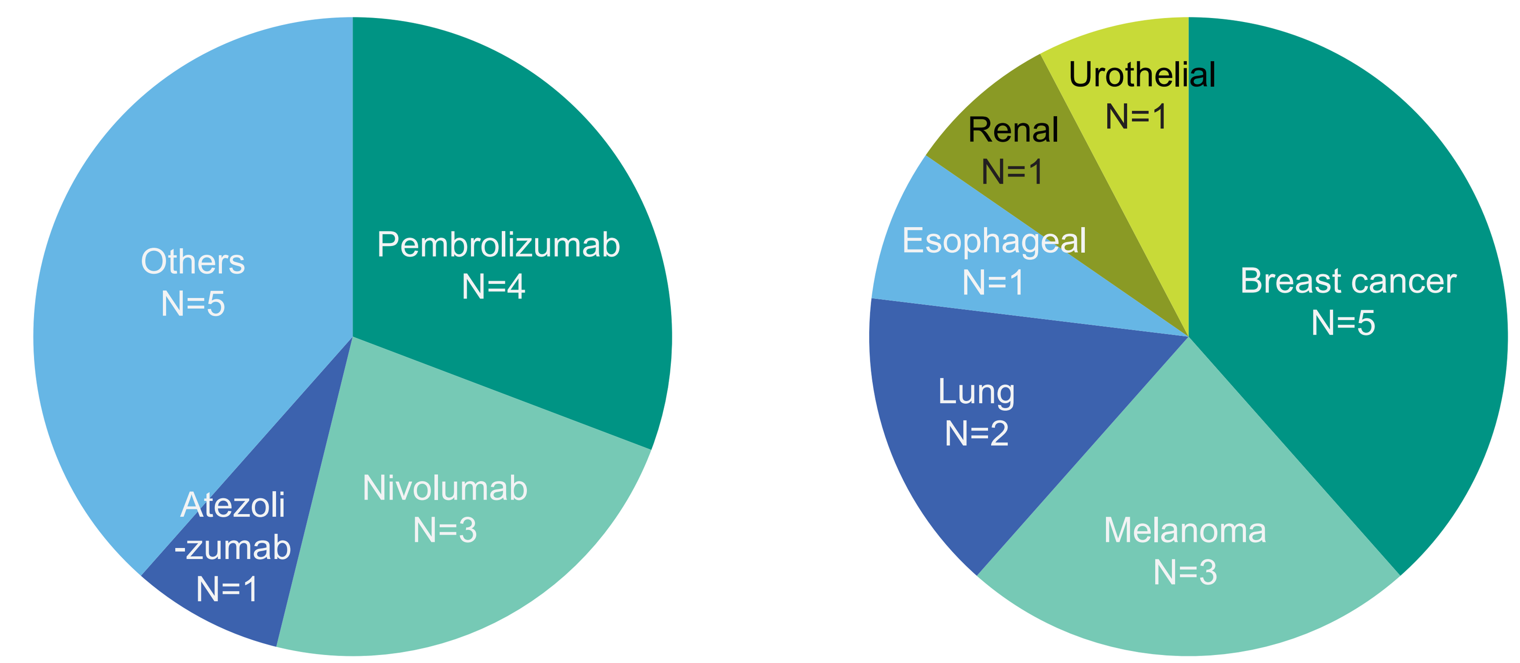

Figure 2. Model structures: common (a) and complex (b)

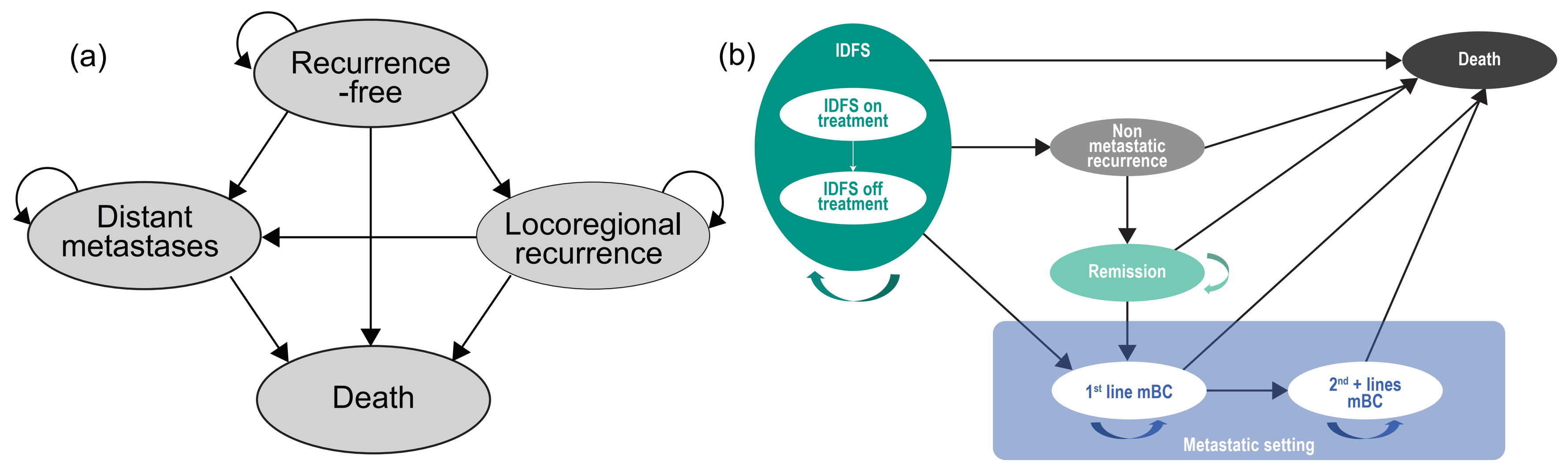

Figure 3. OS availability (a) and early clinical endpoints evidence (b)

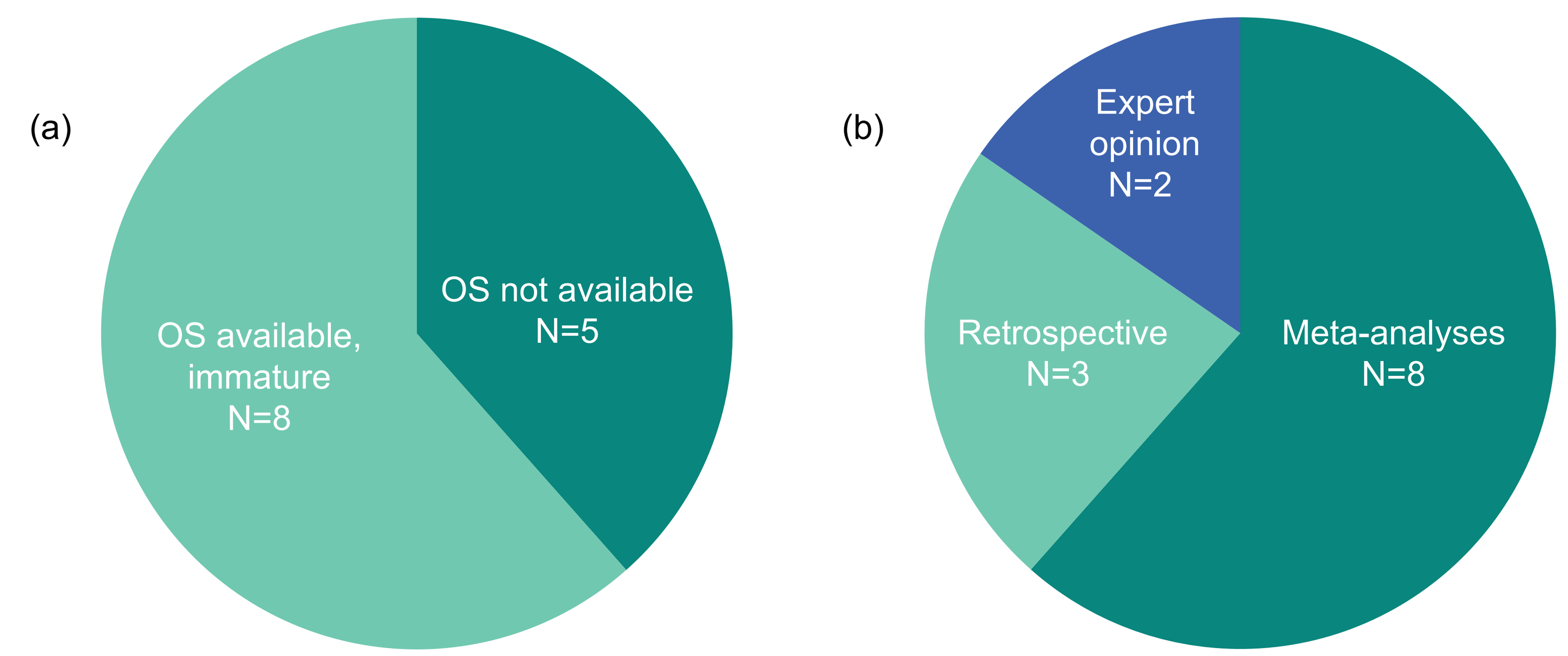

Figure 4. Modeling long-term treatment effect

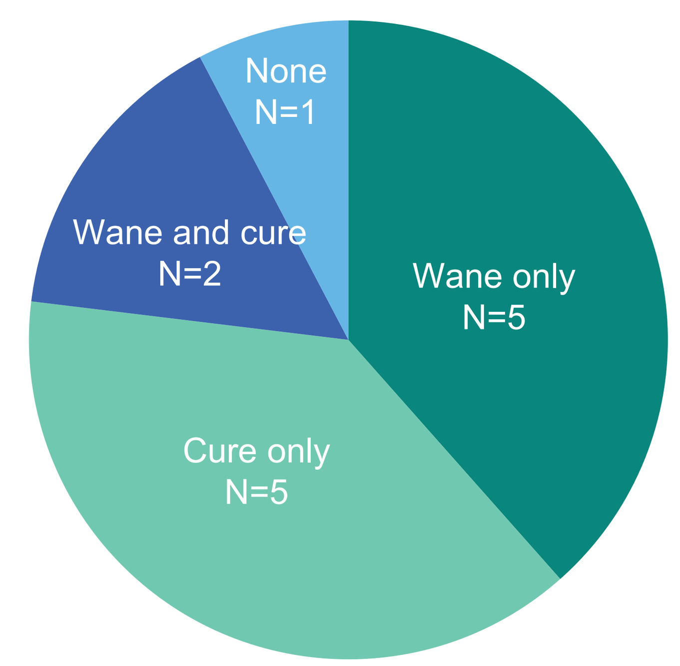

Figure 5. NICE recommendations