

Evidence of Mapping Malpractice? A Review of Mapping Algorithm Usage in NICE Health Technology Appraisals

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Background

- The National Institute for Health and Care Excellence (NICE) methods guidance indicates EQ-5D-3L as the preferred health-related quality of life (HRQoL) measure.¹ As EQ-5D-3L data may not always be available, mapping can be applied to bridge the evidence gap between available clinical study data and cost-effectiveness analysis requirements.
- Where EQ-5D-5L patient-level data are available, published crosswalk algorithms can be leveraged to map to EQ-5D-3L.
- Previous NICE Decision Support Unit (DSU) Technical Support Document (TSD)^{10,2} identified that mapping is used in a quarter of NICE submissions. This was published in 2011 and has since been superseded by TSD22³ in 2023. While these documents^{2,3} provide guidance on conducting mapping studies, current NICE guidelines do not discuss methods for identifying and selecting mapping algorithms for use in cost-utility analyses.

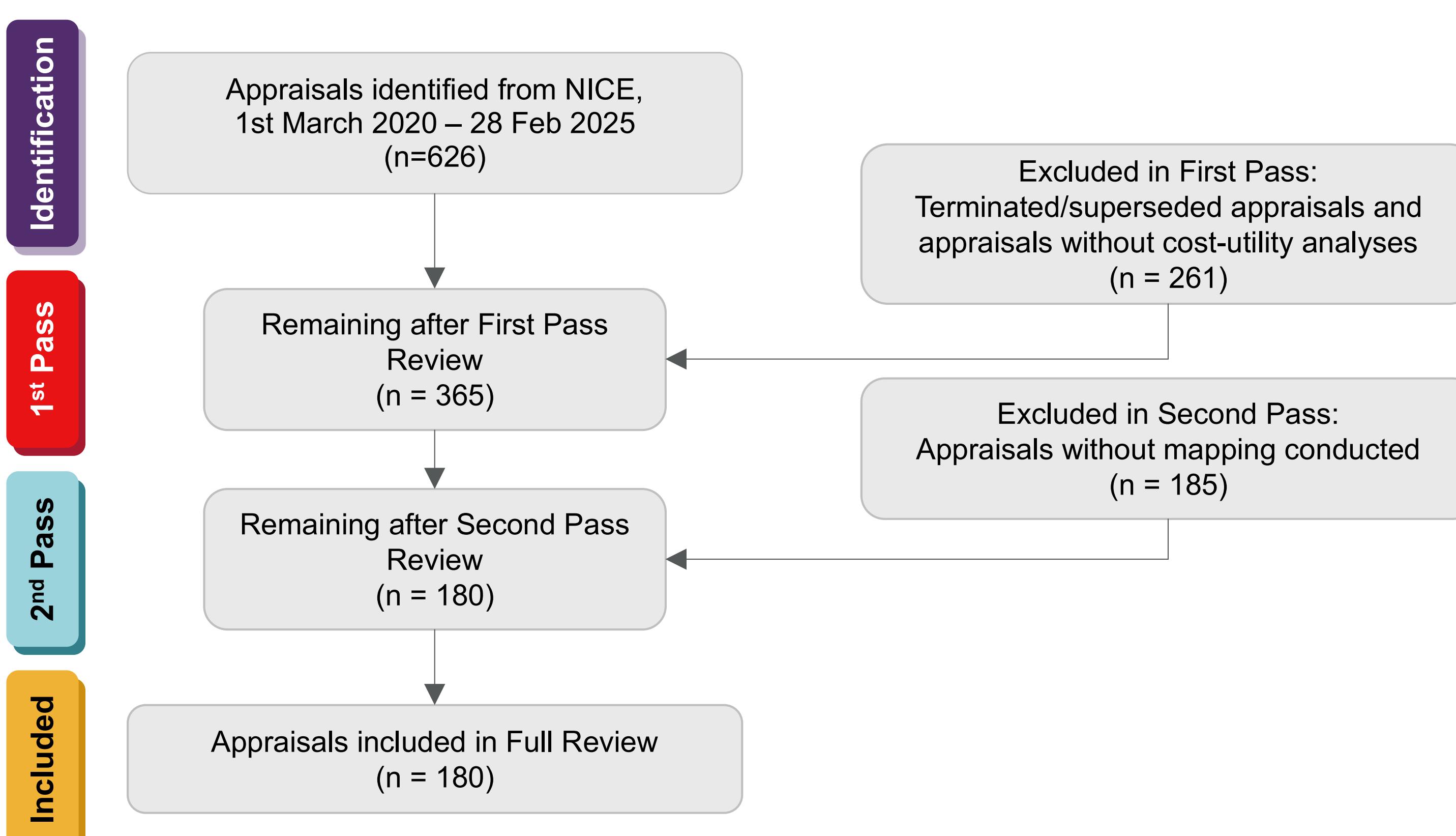
Objectives

- To review NICE appraisals published or updated over the past 5 years to:
 - Quantify the general frequency of mapping algorithm usage
 - Highlight any trends in mapping algorithm usage across appraisals over time
 - Determine which HRQoL instruments were most frequently mapped from
 - Summarise how submitting companies identified and selected candidate algorithms for use in cost-effectiveness analyses, and highlight any relevant critiques from Evidence Assessment Groups (EAGs)

Methods

- The NICE guidance website⁴ was searched to identify technology appraisals published between 01 March 2020 and 28 February 2025.
 - Terminated or superseded appraisals, as well as those without cost-utility analyses conducted, were excluded during first-pass review.
 - In the second-pass review, appraisals without mapping applied were excluded, with remaining appraisals assessed to extract information about mapping analyses conducted.
- Figure 1 presents a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram illustrating the identification, screening, and inclusion of technology appraisals for the review.

Figure 1. PRISMA diagram



Abbreviations: NICE = National Institute for Health and Care Excellence; PRISMA = Preferred Reporting Items Systematic Reviews Meta-Analyses

Results

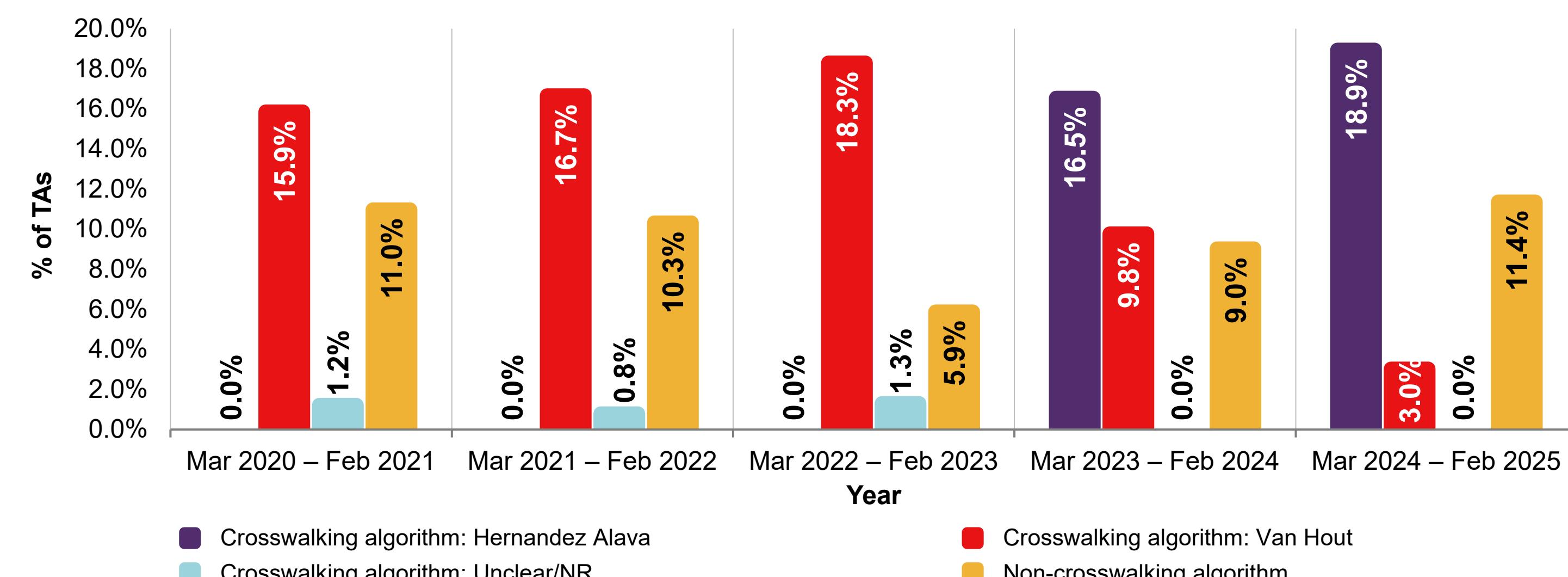
- Of the 626 appraisals screened, 180 (28.8%) were included for full review that reported use of mapping algorithms.
- Among the 180 appraisals included for full review, 127 (70.6%) included use of a crosswalking algorithm to map EQ-5D-5L to EQ-5D-3L.
 - 79 (62.2%) applied the van Hout et al. 2012 crosswalk algorithm.⁵
 - 47 (37.0%) used mapping algorithms from Hernandez-Alava et al. studies.⁶
 - Among these, 3 initially used van Hout et al. 2012 before switching to a Hernandez-Alava et al. study.
 - 4 (3.1%) did not clearly report which crosswalking algorithm was used in available appraisal materials.
- Figure 2 shows the proportion of the total 626 appraisals screened where mapping algorithms were used across yearly time periods:
 - Over time, no clear trend was observed in the use of mapping algorithms.
 - Following the 2022 NICE PMG36 guidance¹ update, use of Hernandez-Alava et al. increased substantially. However, van Hout et al. 2012 was still used in 17 appraisals between March 2023 and February 2025, although this included 2 appraisals that were updated but originally published in late 2021, prior to publication of the PMG36 guidance.

Disclosures

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Results (cont.)

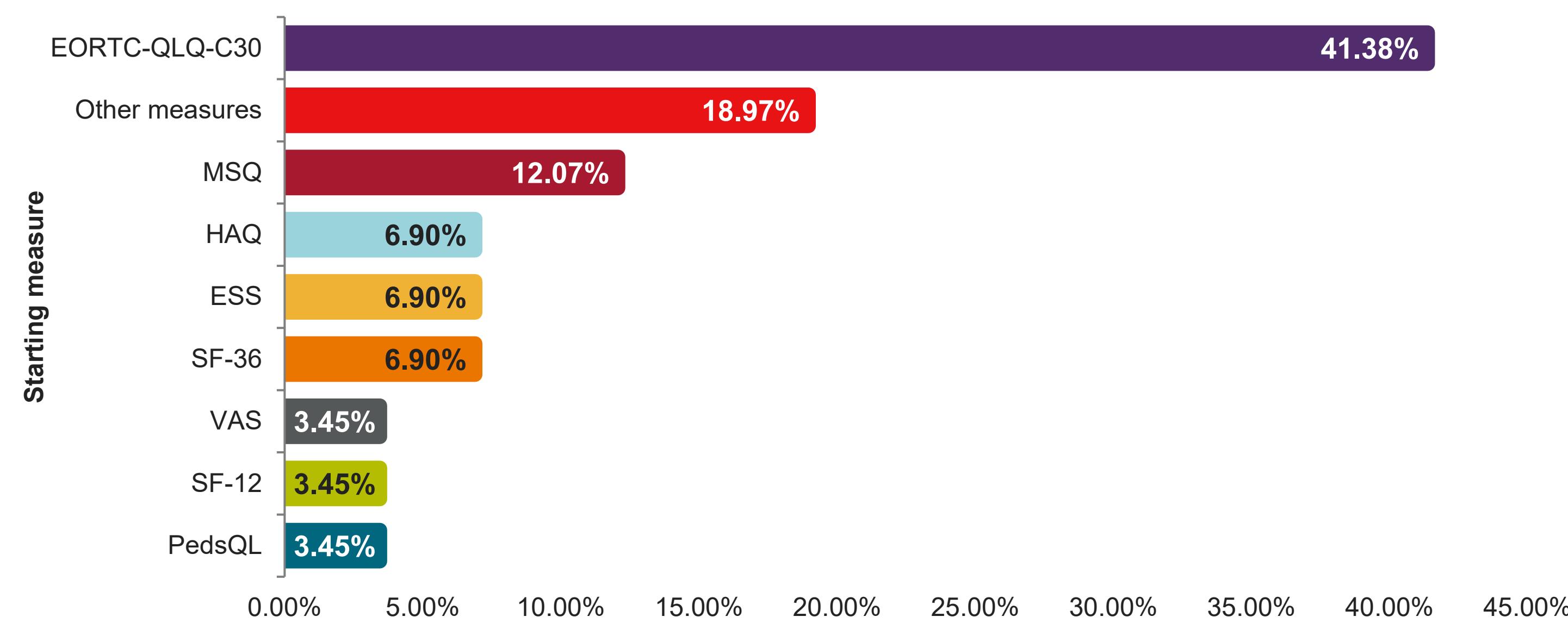
Figure 2. Percentage of TAs per year using crosswalking (Hernandez Alava, Van Hout) and non-crosswalking algorithms to map to EQ-5D-3L



Footnote: Percentages per period do not sum to 100%, as the results are derived from the total appraisals in each yearly time period.
Abbreviation: TA = technology appraisal

- 58 of the 180 appraisals included for full review (32.2%) included other mapping algorithm usage not related to EQ-5D-5L to EQ-5D-3L crosswalking:
 - Among EQ-5D-3L mappings, the most common measure was the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC-QLQ-C30) (Figure 3), mainly used in oncology appraisals (n=20) but also haematology (n=4).

Figure 3. Distribution of QoL measures mapped to EQ-5D-3L among total non-crosswalk mapping TAs



Footnote: Percentages may total above 100%, as some appraisals may mention several utility measures.
Other utility measures include those used in only a single technology appraisal.
Abbreviations: EORTC-QLQ-C30 = European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – Core 30; ESS = Epworth Sleepiness Scale; HAQ = Health Assessment Questionnaire; MSQ = Migraine-Specific Questionnaire; PedsQL = Paediatric Quality of Life Inventory; QoL = quality of life; SF-12 = Short Form Health Survey 12; SF-36 = Short Form Health Survey 36; TA = technology appraisal; VAS = Visual Analogue Scale

- 47 (81.0%) used mapped utility estimates in company base case analyses.
- 53 out of 58 (93.1%) mapped from patient-level data, although a small number (5/58; 8.6%) mapped from summary-level data; one appraisal included mapping from both.
- Submitting companies identified non-crosswalk algorithms of interest through a variety of approaches, often using previous NICE submissions for similar indications:
 - 32 (55%) used previous NICE appraisals.
 - 18 (31%) referenced identification through literature review.
 - 6 (10%) used the Health Economics Research Centre (HERC) mapping database.⁷
 - 16 (28%) did not report their approach to identification of mapping algorithms.
- A wide array of criteria for mapping algorithm selection were considered across the appraisals by submitting companies:
 - However, the application of these criteria was highly inconsistent, and only 9 out of 58 appraisals (15.5%) cited more than two selection criteria.
 - More than half (53%) either did not report selection criteria in the available documentation (21 appraisals) or relied on precedence from previous appraisals (10 appraisals).
 - Where provided, EAG feedback on mapping algorithm selection was fairly appraisal-specific rather than based on a consistent and comprehensive methodology.

Conclusions

- Our review found that mapping still plays an important role in NICE appraisals, however mapping algorithm usage not related to EQ-5D-5L to EQ-5D-3L crosswalking appeared relatively infrequent as a proportion of total appraisals.
- Although use of Hernandez Alava et al. EQ-5D-5L to EQ-5D-3L crosswalk algorithms substantially increased after the NICE PMG36 guideline update in 2022, the application of van Hout et al. 2012 was still present in some appraisals between March 2023 and February 2025.
- Algorithm identification and selection methods were inconsistent across appraisals, suggesting an unmet need for clearer guidelines.

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